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Abstract

This paper examines how the geography of UK international trade has changed since the UK's accession to the European Economic Community using a newly constructed data set that gives a detailed breakdown of the UK's imports and exports by both port of entry and exit and commodity. Our results suggest that between 1970 and 1992 overall imports and exports re-orientated in favour of ports located nearer to the continent. The vast majority of individual commodities also saw a similar re-orientation.

Keywords: UK trade, EEC, economic geography
JEL Classification: F15, F14, R12

1. Introduction

This paper is concerned with the geography of UK international trade. It describes which ports the UK uses to import and export goods. To an international trade economist such questions on the 'how' of trade are interesting, but have traditionally been seen as of second order importance compared to questions relating to the 'why' of trade. Economic geographers have traditionally been more interested in the 'how', but after a brief flurry of activity in the late 1980's and 1990's have moved on to other issues. When we started the work that forms the basis of this paper we *were* interested in economic geography, but of production, not trade. We wanted to assess whether the UK's accession to the European Economic Community (EEC) had affected the economic geography of UK manufacturing. To do this, we needed information on how accession changed the ease of export market access and the degree of import competition faced by firms located in different areas of the UK. To construct these measures we assembled a dataset of UK exports and imports by port with these flows disaggregated into quite detailed commodities. As we worked with this data, we began to realise that the changes in the geography of UK trade were interesting in and of themselves. In addition, our newly constructed data allowed us to consider aspects of these changes that had not been considered in the existing literature. This paper describes these changes over the period 1970 to 1992.

Before presenting our results, we briefly consider why one might be interested in the geography of trade. The first reason relates to the initial aim of our analysis: Where imports enter and exports leave the country influence the internal economic geography of the country. Such ideas have a long history in economic geography tracing back to the work of Harris (1954) on market potential and Hirschman (1958) and Myrdal (1957) on cumulative growth processes. This theoretical framework provides the foundation for empirical work by Bröcker and Peschel (1988) and Chisholm (1995) on the spatial impacts of economic integration. These economic geography impacts have also been the focus of the recent 'New Economic Geography' literature predominantly associated with urban and international economists, see Fujita, Krugman and Venables (1999), Fujita and Thisse (2002), Neary (2001) and Baldwin, Forslid, Martin, Ottaviano, Robert-Nicoud (2003) for overviews. The analysis of this New

Economic Geography literature formalises ideas about the impact of trade from the older literature predominantly associated with economic geographers.

The second reason to focus on the geography of trade across ports is that the location and efficiency of ports play an important role in determining transaction costs between locations and these transaction costs in turn help determine trade patterns. The analysis of the former issue (the determinants of shipping costs) by students of maritime economics has generally been separated from the analysis of the latter issue (the impact of transaction costs on trade) by international trade economists. More recently, however, international trade economists have begun to reconsider the determinants of transactions costs and the impacts on trade flows. For an example of earlier work, see Moneta (1959). The more recent literature is summarised in Limao and Venables (2001). Although our paper does not talk directly to the determinants of transaction costs, it clearly relates to this strand of literature in its focus on the changing geography of trade across different ports as changes in port technologies and closer EEC integration change UK transactions costs with rest of the world.

A third reason for considering the port-structure of trade relates to infrastructure planning and investment. To the extent that the structure can be explained and predicted it can contribute to efficient and appropriate investment programmes.

The rest of this paper is structured as follows. Section 2 outlines the port data that we use for our analysis. That section also surveys existing data sets and the findings of previous studies. Section 3 describes how the geography of trade has changed over the period 1970 to 1992 for both aggregate trade and for individual commodities. Finally, section 4 offers some brief conclusions.

2. Data

The port data set

The main international trade data that underpin our analysis describe UK trade by port and commodity from 1970 to 1992. The dataset was specially constructed from official sources

for the present exercise and, to our knowledge, these sources have never been exploited before at this level of detail. Data on UK trade by port have been published in a variety of locations and formats since 1970: the *Annual Statement of Trade, Vol. V*, (HM Customs and Excise), 1970-75; *Statistics of Trade through United Kingdom Ports*, (HM Customs and Excise), 1976-80; on micro fiche, 1981-87, and then electronically for 1988-92 via the commercial data suppliers, Business Trade Statistics Ltd. The format and structure varies by publication (for example the data are sometimes presented by port, sometimes by commodity) and the classifications evolve from The Standard International Trade Classification (Revised) - SITC(R) - through SITC(2R) and (3R) to the Harmonised System (HS, 1988). In addition to classifying goods differently, the classifications also have rather different coverage of goods – e.g. variations in the treatment of non-monetary gold, tax-free cars, and parcel post. We have attempted to correct for these evolutions as well as to convert the data to a common classification. The latter process requires a certain amount of approximation, which in most cases must be based on the structure of UK total trade rather than that of specific ports. Data are not available by port for trade with the European Union after 1992 because under the Single Market Programme these flows were treated as internal European trade and are recorded via VAT returns rather than by Customs and Excise at the port.

The data on trade flows prior to 1977 are available only at 2-digit (Division) level of the SITC(R). Thus for time series consistency all subsequent data were converted to this basis. The most disaggregated continuous series that could be constructed was at the Division (2-digit) level of the SITC(R), which distinguishes 56 headings, of which we have to drop one (35, gas and electricity) and combine one pair into a single heading (33 and 52 - petroleum products and chemicals deriving from petroleum - which become inextricably entwined in the later classifications). Table 2 in section 3 provides a list of the 54 commodity headings that we use. At this level no volume or deflator data are available, so all data are in value terms. Given the high rates of inflation over much of the period this renders intertemporal absolute comparisons virtually meaningless, but for the purposes of this paper using ports' shares in total exports or imports of a commodity is sufficient.

The source data contain three major unexplained omissions: export data for 1983, both export and import data for 1987, and export data for HS chapters 84-99 for 1989-90. We searched extensively for these omitted data, but ultimately to no avail. We were, however, able to

locate alternative sources for the last set of omissions and thus to complete the series for 1989-90 – see Molinari and Winters (2003). Over the period 1970-92 data are reported for about 120 ports at some point of time. However, the coverage changes through time and there is a fairly continuous process of re-combination of ports into local groups, as the geographical responsibilities of individual customs offices evolved. In most cases we solve these problems by aggregating ports into groups that are invariant over time, but there remain a number of minor inconsistencies. We find the documentation of the later data far inferior and less precise than that of the earlier years, so some of the definitions rely on inference. We do not believe that we have introduced any errors, however. For example, Avonmouth was included in Bristol for 1970-73, the two ports were separated for 1974-80 and after 1980 Bristol disappears as an explicit entry and we take it implicitly to be included in Avonmouth. Overall we are able to compile reasonably consistent data on 92 ports or local groups of ports over 1970-92.

The data have been subject to a number of consistency checks as they have been prepared, including some checking against independent sources. Unfortunately a number of implausibilities remain, mostly, we suspect, in the allocation of trade across ports, since data on trade by commodity have been subjected to extensive use and consideration by other researchers. The most serious remaining mystery is the sharp change in the share of exports of engineering goods (SITC(R) Section 7) passing through Heathrow in 1991. We have been unable to explain this or to find a plausible way of adjusting the data.

Comparison to other port data

What can we learn about the geography of UK trade from this data set that we did not already know from existing studies? Chisholm (1995) reports results from two sets of studies. The first set is related to the changing nature of port hinterlands and forelands.[1] In a series of studies, Hoare (1977, 1985, 1986, 1988) studies these changes using data on the proportion of regional imports and exports that are routed through ports in the same region. This work was updated by Chisholm (1992). Chisholm reports Hoare's results[2] as showing that "if we take

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[1] Hinterlands are the areas that account for imports routed through the port in question. Forelands are the areas that route their exports through the port.
[2] We use Chisholm's (1992) presentation of Hoare's earlier results because footnote 1 on page 563 of Chisholm (1992) suggests that there is an error in Hoare's original paper.

the standard region as the geographical unit of analysis, then in 1964, the tonnage of [firm] exports routed through a port in the same standard region accounted for 63% of the total; by 1978 the proportion had fallen to 48%" [Chisholm 1992, p563]. Chisholm's results for 1986, while not directly comparable, suggest that "the rapid reduction in the strength of local linkages seems to have abated in the period 1978-86" [Chisholm 1992, p563]. The second set of studies, reported in Chisholm (1992, 1995), focuses on patterns of bilateral trade between UK regions and different world regions (EEC, Scandinavian and Baltic etc). Results from these studies suggest that "there is little evidence to suggest that the regions which are nearest to Europe systematically trade with our neighbours on a scale greater than the national average" [Chisholm 1995, p. 130] although there is some evidence of a re-orientation of trade towards ports in regions nearer to the continent.

In comparison with the data used in these studies our data has one weakness: we do not know the origin and destination of individual ports' imports and exports. However, it has two key off-setting strengths, which allow us to complement these earlier studies. First, our data is disaggregated by commodity whereas other data is usually very aggregate. For example, Chisholm (1995) has to consider manufacturing as a single group. Second our data reports the value of trade whereas the findings in both Chisholm (1992, 1995) and Hoare (1977, 1985, 1986, 1988) are based on tonnage.[3]

3. Changes in the Geography of UK Trade

Our main focus is in the changing geography of UK trade following the UK's accession to the EEC in 1973. The post-accession re-orientation of UK trade by source/destination is well-known and needs no rehearsal here – see, among many others, Winters (1984), or Begg *et al* (2003). The fact that this was associated with a re-orientation by port is not so well-known, and it is this phenomenon that we examine in this paper.

The basic series cover exports and imports for 54 2-digit commodity groups, 92 ports and 21 (exports) or 22 (imports) years. We begin our investigation of the geography of UK trade by
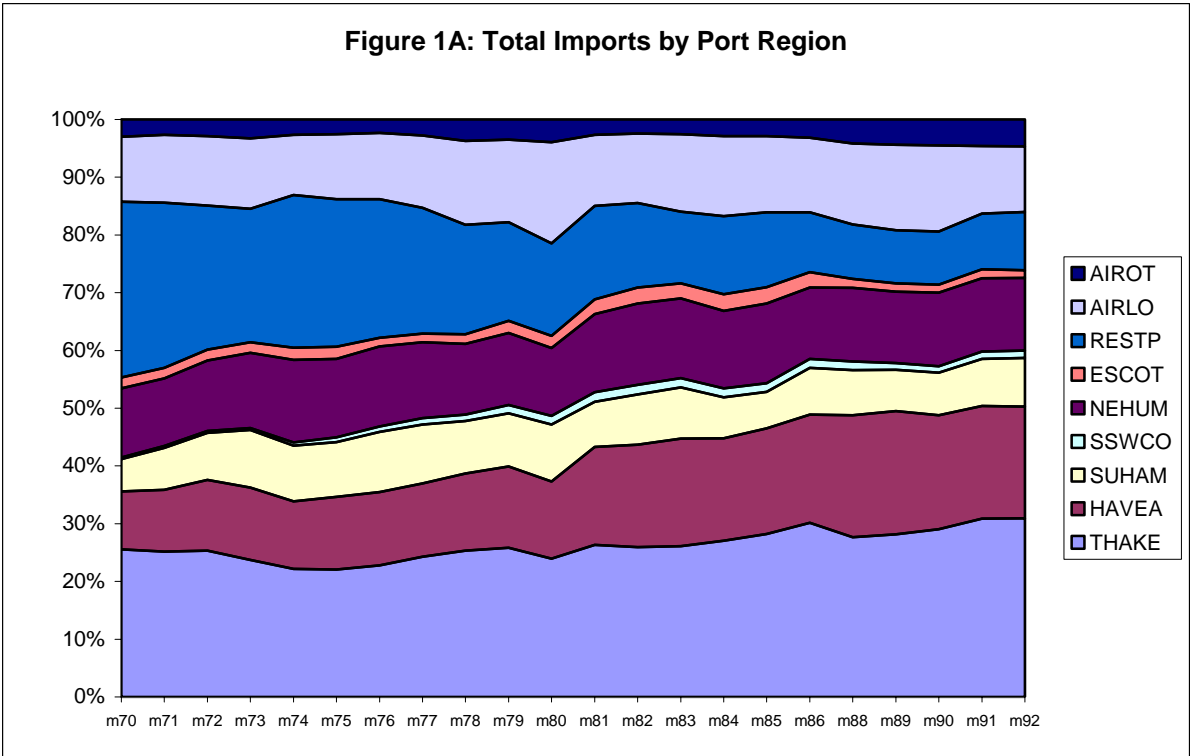
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[3] Chisholm (1995) does report some results based on values, but still using the very aggregate classification of trade by type.

considering patterns for aggregate trade. We distinguish between total imports and exports for all commodities (excluding gas and electricity) and total imports and exports in manufacturing – SITC(R) 5 to 8. For the sake of descriptive convenience in the preliminary work we group ports into nine regions, loosely based on those used by Chisholm (1992, 1995). The nine groups are: Thames and Kent (THAKE), Haven and East Anglia (HAVEA), Sussex and Hampshire (SUHAM), South South West and Cornwall (SSWCO), North East-Humber (NEHUM), East Scotland (ESCOT), Rest of sea ports (RESTP), London Airports (AIRLO) and Other Airports (AIROT). Full definitions are given in the appendix. The grouping is more finely disaggregated around the South East, because we might expect any changes related to the impacts of accession to be more nuanced for ports located closer to the continent. Figures 1A to 1D give the breakdown of UK exports and imports in total[4] and for manufactures across these port groups. These figures illustrate two key characteristics of the changing geography of UK trade. First, the growing share for the upper two segments (AIROT and AIRLO) clearly capture the growing importance of air transportation in the value of British trade. Second, we can see the gradual re-orientation of trade towards the South East port groups – roughly speaking the lower the segment the closer the port groups to the South East corner of Britain. Between 1970 and 1992, the ports in the South of the country (THAKE, HAVEA, SUHAM and SSWCO) see their share in total imports increase by almost 20 percentage points, growing from 41% of total imports in 1970 to 60% of total imports in 1992. Changes in shares of manufactured imports are very similar (from 42% to 62%). The re-orientation of total exports is not as marked. The ports in the south of the country see their share in total exports rise from 46% in 1970 to 56% in 1992. The re-orientation is stronger for manufacturing exports than for total exports. Southern ports see their share of total manufacturing exports rise from 47% to 58%. The major difference between total and manufacturing exports is the large share of ports in the ESCOT group in total exports particularly between 1979 and 1986. This is due solely to exports of oil. These have always been routed through ESCOT ports and during this period they expanded rapidly to account for nearly 15% of the value of visible exports as the world price of oil peaked. In summary, the general picture for both exports and imports is of a re-orientation to ports in the southern part of the country. As discussed above, Chisholm (1992, 1995) finds signs of a similar reorientation.

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[4] Strictly of SITC(R) 0-8; i.e. omitting Section 9 'Commodities not elsewhere classified'.

Figure 1A: Total Imports by Port Region

Source: Authors own calculations using trade data described in Section 2.

Figure 1B: Manufactured Imports by Port Region

Source: Authors own calculations using trade data described in Section 2.

Figure 1C: Total Exports by Port Region

Source: Authors own calculations using trade data described in Section 2.

Figure 1D: Manufactured Exports by Port Region
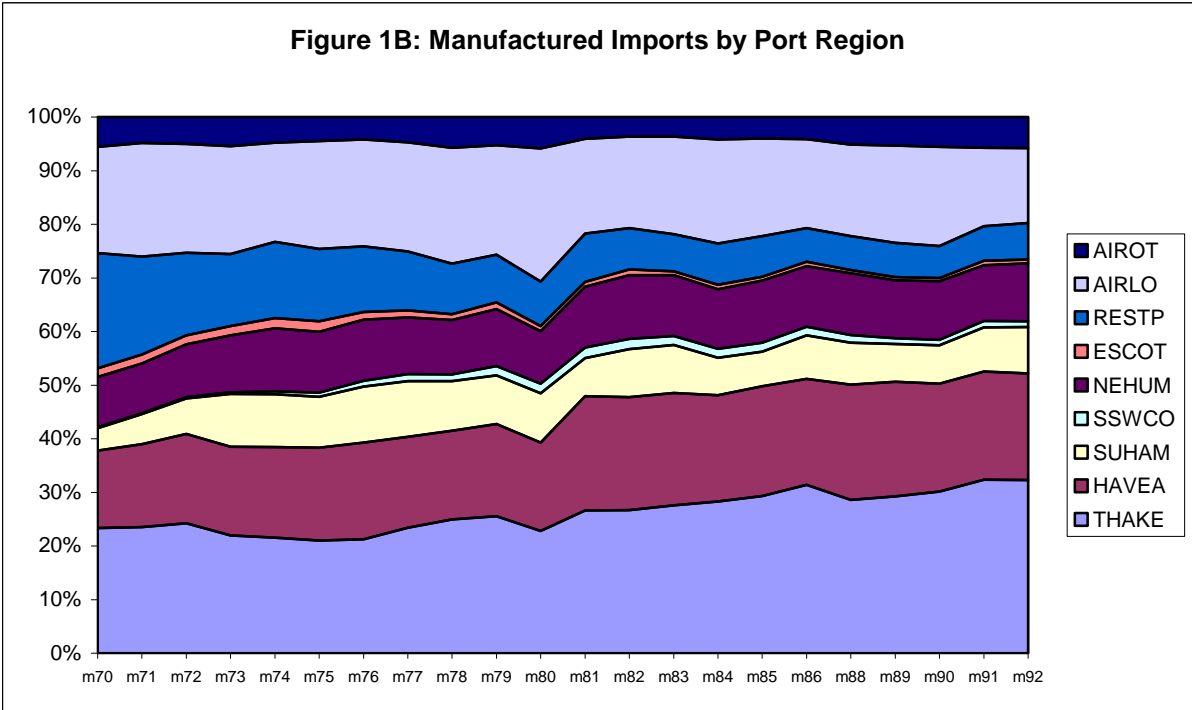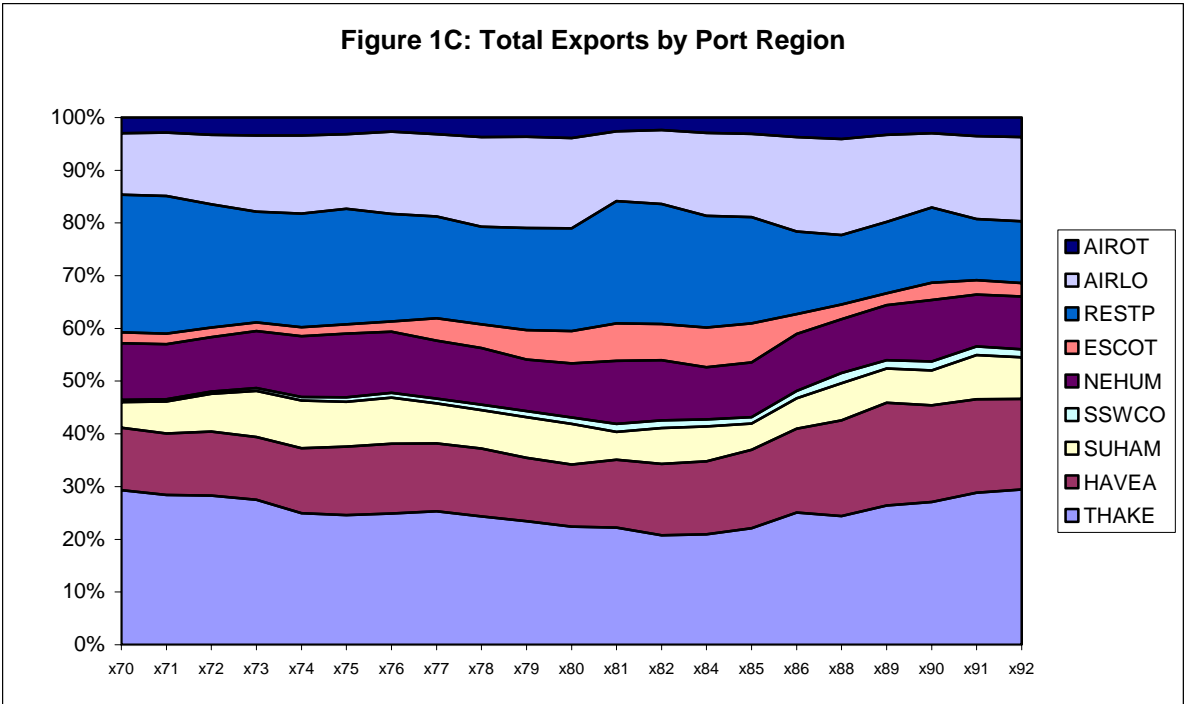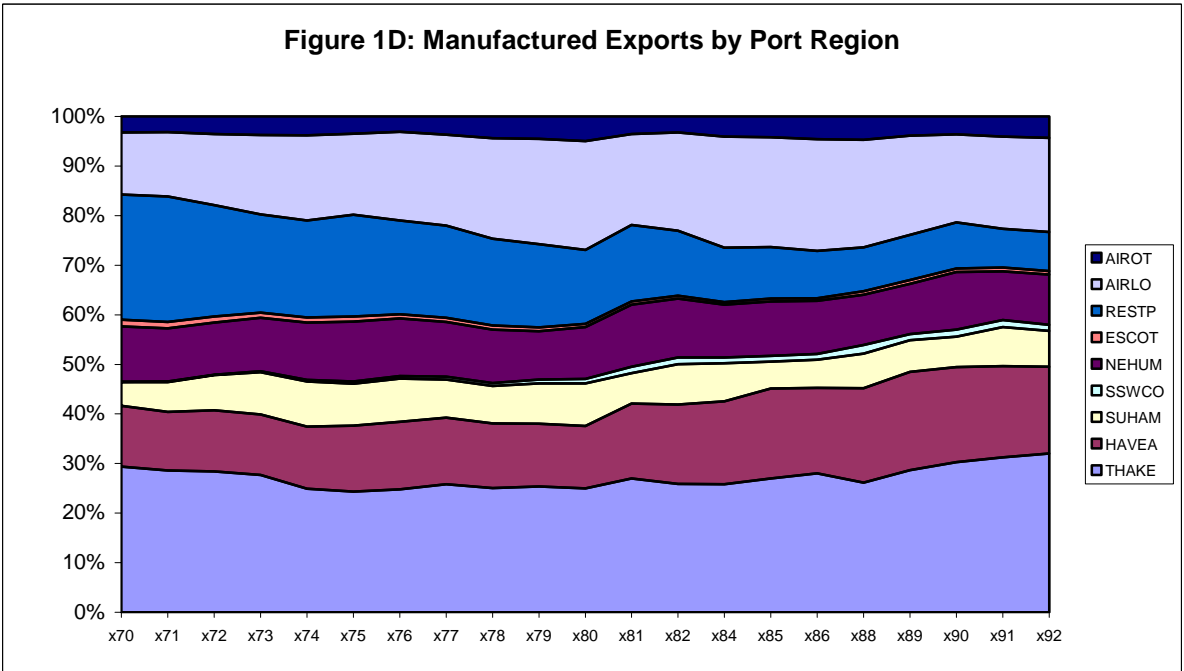
Source: Authors own calculations using trade data described in Section 2.

One possibility is that this changing geography of trade is driven by changes in the concentration of trade across ports. For example, as transportation technologies have changed it is perfectly conceivable that trade should have concentrated (or otherwise), and if it has, one would expect changes in its geographical spread. To examine this possibility we calculated

two indices, the 5-port concentration ratio (C5) and the Herfindhal index, that capture the extent to which trade is concentrated in particular ports. C5 is calculated as the sum of shares of the top five ports at each period in time. The Herfindahl is the sum of squared shares with the summation taken over all ports rather than just the top five. Results for both indices show that there is relatively little evidence of strong changes in concentration for aggregate trade. Figures 2A and 2B report the Herfindahl indices for exports and imports respectively. Both graphs report the index for total trade (total of commodities 00 to 89) and the unweighted mean of the indices for each 2-digit category. The C5 indices, not reported here tell, much the same story. Two results emerge from the concentration indices. First, concentration falls somewhat over the sample period, but not monotonically. Concentration fell during the 1970s and then actually stabilised or rose gradually over the rest of our sample. The former may reflect accession, but given that it starts in 1970 (or before – we cannot tell), it probably does not. For both imports and exports the increases in concentration in the second half of the period are not enough to offset the falls seen at the start of the period. Second, the unweighted mean of 2 digit indices is considerably higher than the index for overall concentration. This reflects the fact that although most commodities are more concentrated than aggregate trade they are concentrated on different ports. This, in turn, could reflect either that ports are relatively specialised or that production of commodities is concentrated, but in different places, and firms use local ports.
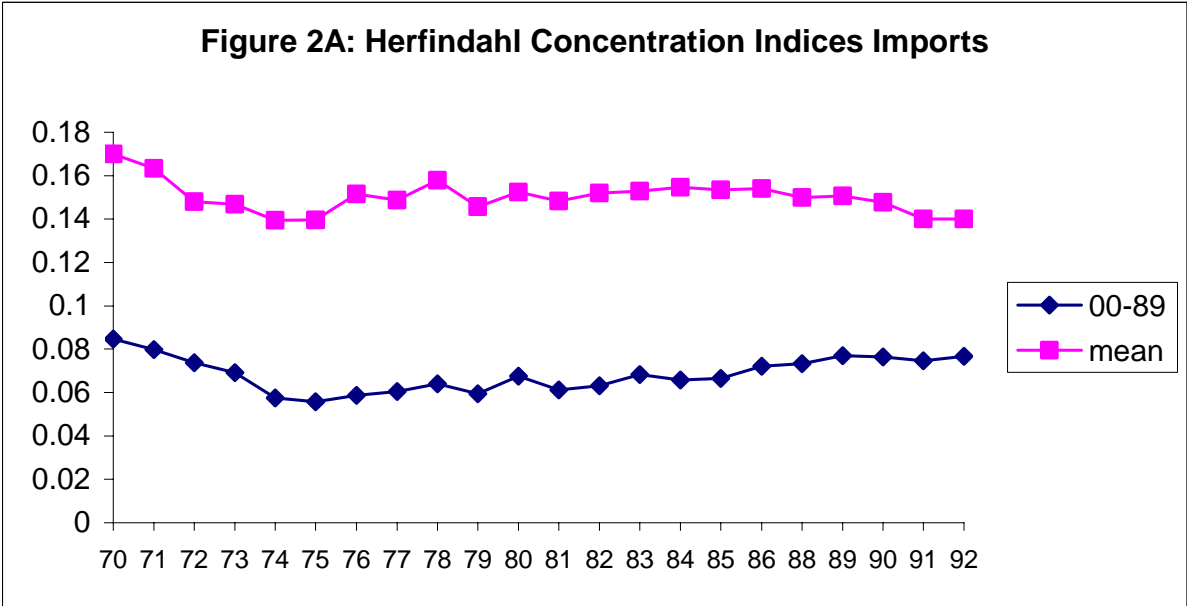
Source: Authors own calculations using trade data described in Section 2.

Figure 2B: Herfindahl Concentration Indices Exports
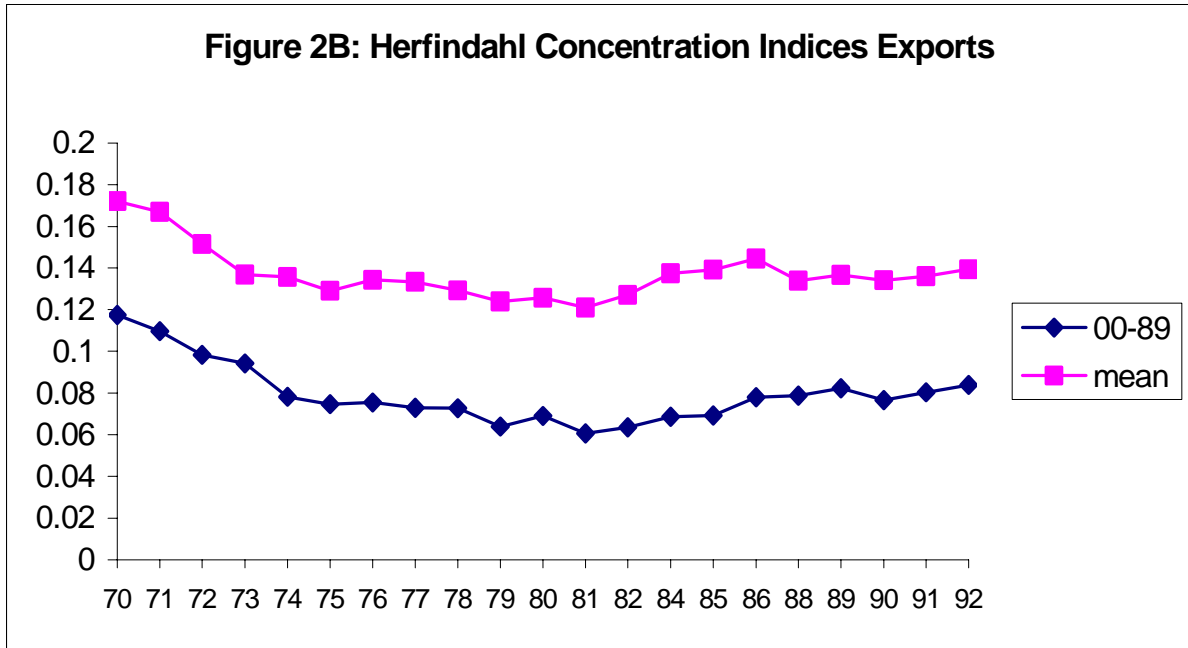
Source: Authors own calculations using trade data described in Section 2.

Although the C5 indices have changed rather little, the ports within the top five have evolved through time – gravitating a little towards the South East. Tables 1A and 1B report the top five ports in 1970 and 1992 for manufactured trade imports and exports. Calculations for total trade, not reported here, give similar outcomes.

Table 1A: Top five ports for imports (% share manufactured imports)

1970		1992	
Heathrow Airport	18.3%	Dover	19.7%
London	18.3%	Heathrow Airport	13.2%
Liverpool	8.2%	Felixstowe	12.8%
Harwich	7.6%	Southampton	6.6%
Felixstowe	5.2%	London	5.3%

Source: Authors own calculations using trade data described in Section 2.

Table 1B: Top five ports for exports (% share manufactured exports)

1970		1992	
London	26.2%	Dover	19.6%
Liverpool	16.0%	Heathrow Airport	17.7%
Heathrow Airport	12.0%	Felixstowe	11.5%
Harwich	6.9%	London	6.9%
Hull	5.8%	Southampton	4.7%

Source: Authors own calculations using trade data described in Section 2.

Table 2: Concentration Ratios by Commodity Group

		Exports				Imports			
		C5 ratios			Leading Ports Share %	C5 ratios			Leading Ports Share %
		1970	1992	Leading port		1970	1992	Leading port	
00	Live animals (excluding zoo animals, dogs, cats)	0.731	0.818	Dover	32.3	0.910	0.908	All Other Airports	40.7
01	Meat and meat preparations	0.653	0.830	Dover	32.5	0.668	0.626	London	17.1
02	Dairy products and birds' eggs	0.754	0.554	Felixstowe	20.1	0.591	0.556	Dover	22.2
03	Fish (not British taking) and fish prep	0.523	0.726	Dover	41.6	0.820	0.686	Grimsby	18.6
04	Cereals and cereal preparations	0.592	0.470	Immingham	12.4	0.637	0.578	London	14.1
05	Fruit and vegetables	0.511	0.528	Dover	14.2	0.653	0.567	Dover	22.6
06	Sugar, sugar preparations & honey	0.815	0.697	Felixstowe	25.3	0.945	0.826	London	53.8
07	Coffee, tea, cocoa and spices	0.775	0.687	Felixstowe	23.9	0.923	0.737	Felixstowe	31.5
08	Feeding stuff for animals	0.654	0.586	Irish Land	17.0	0.740	0.495	Liverpool	11.4
09	Miscellaneous food preparations	0.722	0.640	Felixstowe	17.0	0.756	0.637	Irish Land	29.5
11	Beverages	0.709	0.673	Felixstowe	22.2	0.652	0.631	Dover	20.9
12	Tobacco and tobacco manufactures	0.813	0.836	Southampton	37.4	0.835	0.753	Felixstowe	30.0
21	Hides, skins and furskins, undressed	0.873	0.751	Dover	26.1	0.875	0.779	Irish Land	32.9
22	Oil seeds oil nuts oil kernels	0.738	0.509	Grimsby	20.2	0.940	0.895	Liverpool	33.2
23	Crude rubber (including synthetic & reclaimed)	0.617	0.605	Felixstowe	16.6	0.835	0.699	Felixstowe	24.9
24	Wood, lumber and cork	0.741	0.600	Irish Land	32.9	0.577	0.485	Hull	11.3
25	Pulp and waste paper	0.800	0.658	Felixstowe	23.1	0.660	0.705	Medway	22.4
26	Textile fibres not manufactured & their waste	0.700	0.724	Dover	34.2	0.778	0.641	Felixstowe	30.5
27	Crude fertilisers and minerals	0.744	0.666	Fowey	41.2	0.505	0.444	London	9.0
28	Metalliferous ores and metal scrap	0.639	0.596	Felixstowe	24.0	0.533	0.582	Heathrow	26.0
29	Crude animal/vegetable materials N.E.S.	0.700	0.652	Dover	22.9	0.621	0.612	Felixstowe	23.1
32	Coal, coke and briquettes	0.679	0.607	Swansea London	22.9	0.525	0.631	Immingham London	16.0
33. 52	Petroleum and petroleum products	0.824	0.836	Lerwick	47.2	0.774	0.757	Immingham	19.0
34	Gas, natural and manufactured	0.928	0.817	Kirkcaldy	38.9	0.914	0.966	Peterhead	72.3
41	Animal oils and fats	0.749	0.689	Dover	23.3	0.938	0.844	London	33.4
42	Fixed vegetable oils and fats	0.922	0.730	Felixstowe	18.7	0.972	0.925	Hull	29.6
43	Animal and vegetable oils fats and waxes	0.839	0.792	Ellsmere Port	31.7	0.888	0.779	Hull	23.2
51	Chemical elements and compounds	0.695	0.609	Dover	18.7	0.451	0.509	Dover	15.3
53	Dyeing, tanning and colouring materials	0.722	0.645	Dover	22.5	0.698	0.682	Dover	23.9
54	Medicinal and pharmaceutical products	0.807	0.715	Heathrow	32.2	0.637	0.708	Dover	28.5
55	Essential oils and perfume materials	0.748	0.589	Dover	22.3	0.692	0.645	Dover	32.7
56	Fertilisers, manufactured	0.775	0.758	Irish Land	45.0	0.329	0.392	Immingham	15.0
57	Explosives and pyrotechnic products	0.714	0.729	Heathrow	32.4	0.672	0.644	Heathrow	26.1
58	Plastic materials	0.636	0.606	Dover	21.6	0.598	0.601	Felixstowe	20.4

59	Chemical materials and products, N.E.S.	0.754	0.590	Felixstowe	19.7	0.583	0.543	Dover	19.8
61	Leather, leather manufactures, N.E.S.	0.740	0.767	Heathrow	28.9	0.740	0.720	Dover	32.6
62	Rubber manufactures, N.E.S.	0.667	0.599	Dover	20.8	0.491	0.569	Dover	21.1
63	Cork and wood manufactures (excluding furniture)	0.644	0.547	Felixstowe	15.0	0.682	0.564	London	22.9
64	Paper, paperbound, and manufactures thereof	0.659	0.607	Dover	19.3	0.689	0.609	Felixstowe	15.5
65	Textile yarn, fabrics, made-up articles	0.633	0.627	Dover	30.1	0.595	0.604	Dover	34.8
66	Non- metallic mineral manufactures, N.E.S.	0.890	0.805	Heathrow	58.8	0.913	0.858	Dover	26.5
67	Iron and steel	0.546	0.464	Felixstowe	11.3	0.520	0.493	Dover	11.3
68	Non-ferrous metals	0.762	0.664	Dover	23.3	0.693	0.595	Heathrow	14.5
69	Manufactures of metal, N.E.S.	0.698	0.552	Dover	21.1	0.581	0.571	Dover	27.2
71	Machinery, other than electric	0.651	0.633	Dover	22.0	0.557	0.612	Dover	21.1
72	Electrical machinery, apparatus and appliances	0.764	0.627	Heathrow	26.6	0.672	0.691	Heathrow	27.5
73	Transport equipment	0.652	0.640	London	19.4	0.620	0.553	Medway	14.4
81	Sanitary, plumbing, heating and lighting fixtures	0.708	0.645	Dover	22.9	0.608	0.603	Dover	35.2
82	Furniture	0.732	0.630	Dover	25.4	0.812	0.740	Dover	35.0
83	Travel goods, handbags and similar articles	0.752	0.678	Dover	26.7	0.777	0.834	Felixstowe	28.8
84	Clothing	0.710	0.644	Dover	39.4	0.780	0.762	Dover	27.0
85	Footwear, gaiters and the like	0.733	0.679	Dover	23.9	0.646	0.745	Dover	35.5
86	Professional, scientific and controlling instruments	0.777	0.720	Heathrow	32.8	0.753	0.740	Heathrow	33.2
89	Miscellaneous manufactured articles, N.E.S.	0.770	0.717	Heathrow	31.9	0.790	0.745	Heathrow	25.9
	Aggregations:								
00-86	aggregates	0.646	0.561			0.536	0.534		
	weighted means	0.721	0.663			0.705	0.668		
	unweighted means	0.091	0.090			0.143	0.127		

Source: Authors own calculations using trade data described in Section 2.

Table 2 explores the concentration data for individual commodity groups. It gives C5 ratios for 1970 and 1992 – showing for both exports and imports the declines in concentration - and also, for 1992, the leading port and its share of trade in the commodity. The leading ports data illustrate a number of interesting features. First, the dominance of Dover (top in 23 out of 54 commodities for exports and 19 for imports), followed by Felixstowe (12 and 8) and Heathrow (7 and 6). Among manufactures, only five of the 54 entries is not one of these three, and only one commodity (56 Fertilizers) lists any port outside the south east. Among primaries (a broad group in the trade classifications including processed foods and materials) a much wider spread set of ports is represented.

Second, whereas for manufacturers the same port is listed for exports and imports 15 out of 27 times, this is true for only 3 commodities in the primaries set. In some cases we suspect that this reflects special needs – e.g. Heathrow for electrical and electronic equipment (72), scientific instruments (86) and miscellaneous manufacturers (89) all with high value to weight ratios; in others the cause is probably the general dominance of Dover in RO-RO trade and Felixstowe in container traffic. Manufactures lend themselves to intra-industry trade – trade in similar goods – and so the same port will do for both flows. For primaries, two factors may lie behind the dissimilarity in ports: it is possible that exports and imports classified in the same 2-digit category are still very different and thus require different port facilities. Alternatively the differences may reflect different comparative advantages in these sub-groups in different regions of the UK – e.g. for, oil seeds etc (22), surpluses in eastern England and deficits in western England.

Focusing on port shares in overall trade instead of port rankings, the general re-orientation towards the South East becomes more apparent. Table 3 presents port shares in total exports and imports for all major ports in three years: 1972, 1982 and 1992.[5] Ports are ranked by their share in total exports in 1972. Several features stand out when we take Tables 1 and 3 together. First the rise of Dover as a major trading port and the corresponding decline of Liverpool. Dover, saw its share in both imports and exports increase more than three-fold over the twenty year period, while Liverpool saw a decline of similar magnitude. Interestingly, the contrast between the relative performance of London and Felixstowe suggests that port location alone is not sufficient to explain the changing geography of UK trade. Felixstowe and London are both major specialist deep-sea ports, both located in the south of England. But while Felixstowe saw its role rising, London saw a marked decline in its role. As discussed further in Chisholm (1995) such contrasts suggest an important role for additional factors other than location, such as port efficiency, in determining port outcomes. Among those explaining the contrast between Felixstowe and London was that the former was outside the National Dock Labour Scheme and the latter inside. This scheme was a highly restrictive labour agreement which, until its abolition, reduced productivity and stifled innovation in member ports.

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[5] Major ports are defined as having a share of 2% or over in total exports or imports in either 1972 or 1992.

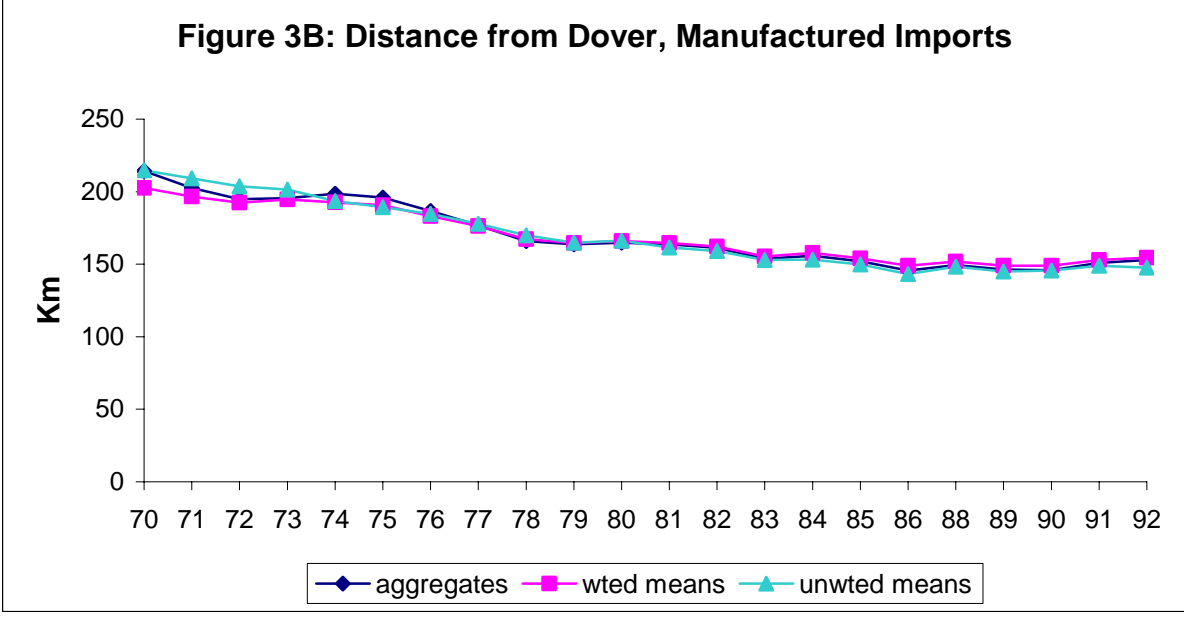**Table 3: Trade shares of major ports (% total trade)**

Port	Exports 1972	1982	1992	Port	Imports 1972	1982	1992
Ramsgate	0.1	0.1	2.8				
Portsmouth	0.1	0.5	2.1				
Medway	0.1	1.2	2.2	Medway	0.6	3.0	4.2
				Ipswich	0.7	2.0	2.0
Immingham	2.0	3.3	2.6	Immingham	2.4	4.5	4.5
Middlesbrough	2.1	2.3	2.7	Middlesbrough	2.0	2.4	2.4
				Milford	2.2	3.0	1.1
				Avonmouth	2.3	1.1	0.7
Manchester	2.5	0.3	0.0	Manchester	2.5	0.3	0.1
Hull	4.3	4.0	3.3	Hull	4.2	3.2	2.7
Felixstowe	4.4	8.1	11.3	Felixstowe	4.3	9.5	12.3
Dover	5.3	12.1	18.0	Dover	5.5	13.4	17.5
Harwich	6.2	2.6	3.9	Harwich	5.7	4.8	4.6
Southampton	6.5	5.6	5.5	Southampton	6.6	7.1	6.3
Liverpool	11.4	3.9	2.9	Liverpool	8.5	2.5	3.0
Heathrow Airport	12.7	12.7	14.9	Heathrow Airport	11.0	11.0	10.8
London	22.7	7.4	6.5	London	18.9	9.0	6.7

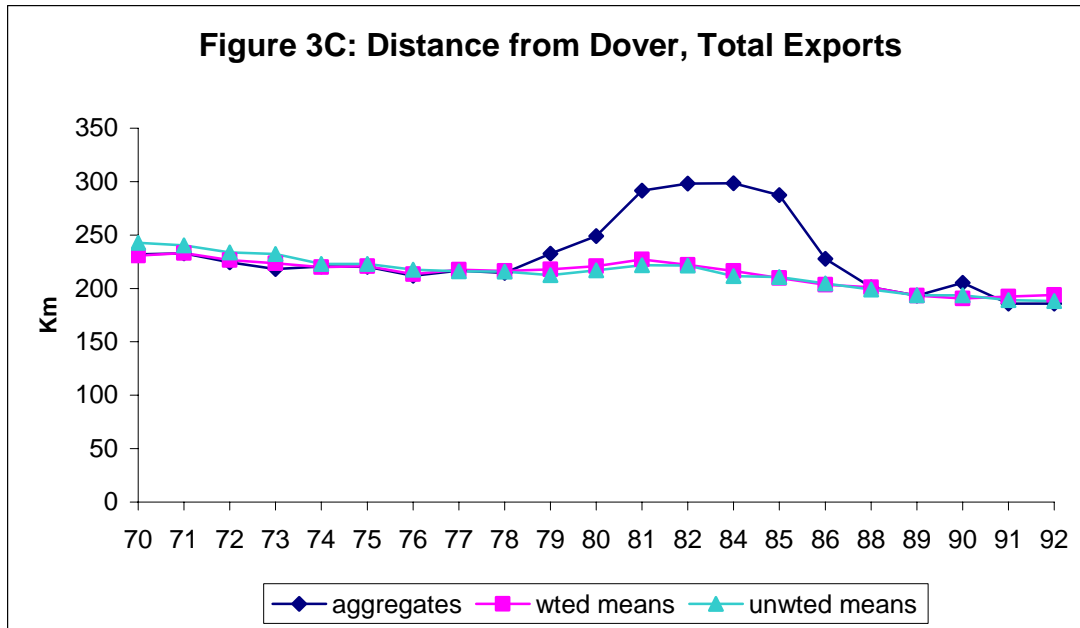Source: Authors own calculations using trade data described in Section 2.

Our evidence so far has been based on the shares of particular ports or groups of ports. Figure 3 attempts to capture the geographical pattern of trade more directly. It summarises the distance from Dover of an average £1 of exports and imports over time. Distances are the straight-line distances between each port and Dover in kilometres based on national grid references, and these are weighted up by shares of the particular flow passing through each port. Each graph contains three series, although they are mostly visually indistinguishable: the series based on aggregate trade (total or manufactured), the unweighted mean of the series for each component 2-digit commodity and the weighted average of these using as weights the commodity's share of the total value of trade over 1970-80. (Given the inflation of the 1970s, these weights derive more strongly from later years than earlier ones, but given the similarity of the three indices rebasing the weighted averages to an earlier period seems most unlikely to make any difference).
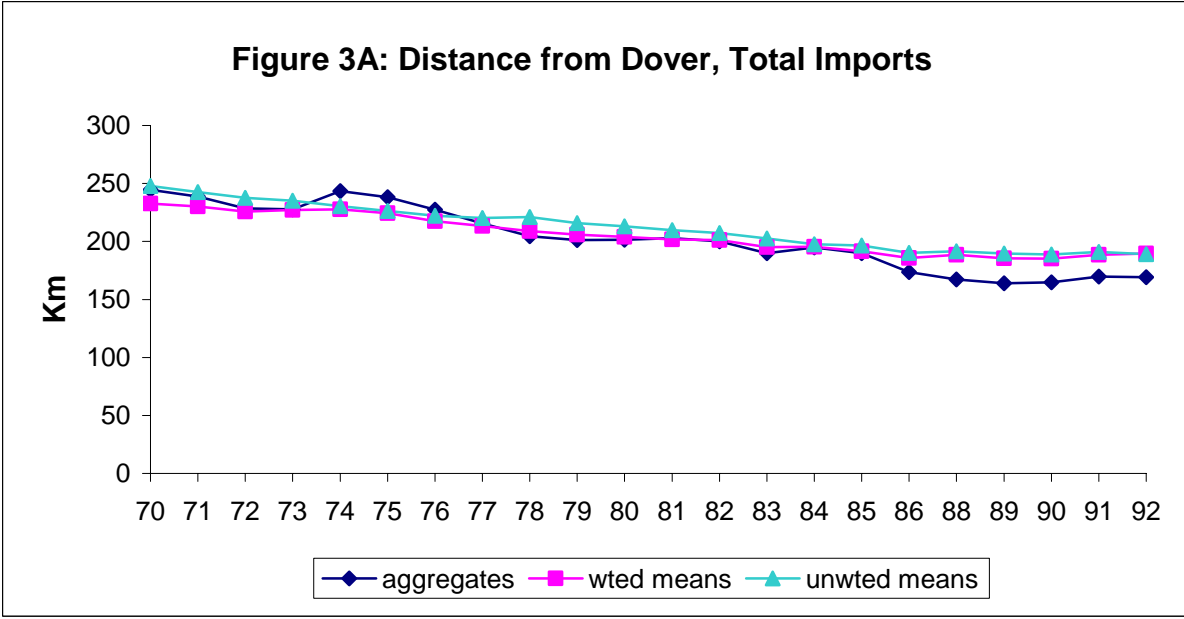
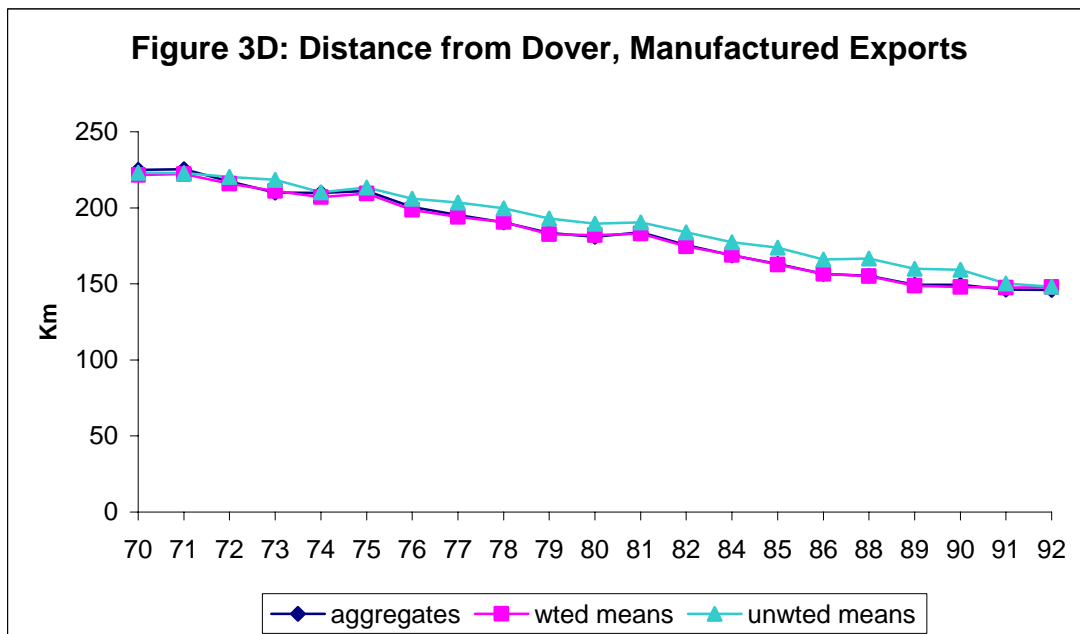**Figure 3A: Distance from Dover, Total Imports**

Source: Authors own calculations using trade data described in Section 2.

Figure 3B: Distance from Dover, Manufactured Imports

Source: Authors own calculations using trade data described in Section 2.

Figure 3C: Distance from Dover, Total Exports

Source: Authors own calculations using trade data described in Section 2.

Figure 3D: Distance from Dover, Manufactured Exports

Source: Authors own calculations using trade data described in Section 2.

Figure 3 eloquently captures the gravitation of UK trade towards the ports of the South East, especially in manufactures, where the mean distance from Dover falls by around 35% for exports and 25% for imports. The only obvious surprise in figure 3C is the sudden increase in distance for total exports over 1979-86. As for our earlier results on port group shares this is due solely to exports of oil.

We now repeat the 'distance from Dover' analysis using individual commodity data instead of aggregated trade data. Table 4 reports the distance from Dover for each commodity for both imports and exports. The table reports results for 1972, 1982 and 1992 and for the percentage change between 1972 and 1992. The mean distance for each commodity is calculated exactly as above for overall trade. The bottom three rows give the distance from Dover for aggregated trade, and also report weighted and unweighted commodity means (as plotted in Figures 3A to 3D above).

Several features are worth noting. First, as we might expect from table 2, manufacturers (SITC(R) categories 51-89) are typically 'closer to Dover' than non-manufacturers: the differences are statistically significantly at 5% and remain so, except for exports in 1972, even if we exclude the fuels data (SITC(R) 3) which are rather special. Second, the distances from Dover are positively correlated both through time for each flow (imports and exports) and for each year between flows: the correlation co-efficients exceed 0.55 in all cases except where imports in 1972 are involved for which they are somewhat lower. Third, a clear majority of commodities, 43 out of 54, see a re-orientation towards Dover for both imports and exports. Table 4 reports the ten commodities that show the largest re-orientation towards Dover. The commodities showing these largest re-orientations are somewhat mixed. For exports, we find three chemicals industries, three 'animal' industries and two textiles industries in the top 10. For imports, we find four textile industries, but no particular pattern with regard to the remaining six industries.

Table 3: Distance from Dover by Commodity

		Exports				Imports			
		1972	1982	1992	% change 1972-92	1972	1982	1992	% change 1972-92
00	Live animals (excluding zoo animals, dogs, cats)	208	154	112	-46.4	437	376	318	-27.2
01	Meat and meat preparations	100	65	65	-35.4	209	188	158	-24.0
02	Dairy products and birds' eggs	247	256	198	-20.0	257	233	171	-33.4
03	Fish (not British taking) and fish prep	337	232	156	-53.7	238	217	222	-6.5
04	Cereals and cereal preparations	224	250	190	-15.1	322	251	188	-41.7
05	Fruit and vegetables	245	227	182	-25.6	182	152	122	-33.3
06	Sugar, sugar preparations & honey	220	219	158	-28.0	290	210	192	-33.8
07	Coffee, tea, cocoa and spices	201	188	172	-14.3	252	221	156	-38.2
08	Feeding stuff for animals	263	205	157	-40.4	292	318	272	-7.1
09	Miscellaneous food preparations	215	198	170	-21.0	214	175	154	-28.0
11	Beverages	435	334	267	-38.6	138	140	156	12.4
12	Tobacco and tobacco manufactures	151	173	204	35.1	320	230	158	-50.5
21	Hides, skins and furskins, undressed	125	101	126	1.2	157	122	166	5.9
22	Oil seeds oil nuts oil kernels	196	219	346	76.0	290	247	222	-23.5
23	Crude rubber (including synthetic & reclaimed)	263	198	155	-41.0	263	198	159	-39.4
24	Wood, lumber and cork	209	516	197	-5.9	267	262	274	2.5
25	Pulp and waste paper	144	129	158	9.2	285	253	323	13.4
26	Textile fibres not manufactured & their waste	268	159	109	-59.4	320	206	155	-51.6
27	Crude fertilisers and minerals	367	346	317	-13.5	331	310	300	-9.3
28	Metalliferous ores and metal scrap	227	209	216	-4.8	307	241	235	-23.5
29	Crude animal/vegetable materials N.E.S.	176	170	129	-27.2	195	149	123	-36.9
32	Coal, coke and briquettes	364	366	380	4.3	284	361	317	11.7
33.52	Petroleum and petroleum products	282	758	718	154.7	313	320	321	2.6
34	Gas, natural and manufactured	376	599	597	58.7	145	692	625	331.2
41	Animal oils and fats	313	229	187	-40.1	321	290	207	-35.5
42	Fixed vegetable oils and fats	235	244	178	-24.4	313	266	247	-20.8
43	Animal and vegetable oils fats and waxes	274	247	288	5.2	352	225	237	-32.8
51	Chemical elements and compounds	272	253	186	-31.5	241	216	195	-19.1
53	Dyeing, tanning and colouring materials	238	169	142	-40.2	201	128	132	-34.0
54	Medicinal and pharmaceutical products	182	159	124	-32.1	156	104	118	-24.6
55	Essential oils and perfume materials	187	177	140	-24.9	140	140	125	-10.8
56	Fertilisers, manufactured	304	345	264	-13.1	335	293	316	-5.9
57	Explosives and pyrotechnic products	347	249	115	-66.8	317	177	126	-60.3
58	Plastic materials	249	192	143	-42.6	190	149	142	-25.5
59	Chemical materials and products, N.E.S.	250	205	145	-42.0	226	175	154	-32.0
61	Leather, leather manufactures, N.E.S.	171	129	114	-33.2	257	124	94	-63.5
62	Rubber manufactures, N.E.S.	231	187	148	-36.2	188	168	133	-29.5
63	Cork and wood manufactures (excluding furniture)	166	177	194	17.3	225	182	190	-15.4
64	Paper, paperbound, and manufactures thereof	211	181	150	-28.9	213	184	175	-17.9
65	Textile yarn, fabrics, made-up articles	246	170	121	-50.7	217	143	107	-50.7
66	Non- metallic mineral manufactures, N.E.S.	150	154	140	-6.6	127	137	126	-1.5
67	Iron and steel	352	280	239	-32.1	285	249	223	-21.8
68	Non-ferrous metals	190	142	134	-29.4	268	176	176	-34.4
69	Manufactures of metal, N.E.S.	248	183	169	-31.6	208	154	140	-32.6
71	Machinery, other than electric	228	170	138	-39.7	207	155	177	-14.4
72	Electrical machinery, apparatus and appliances	196	160	154	-21.8	177	155	156	-12.1
73	Transport equipment	211	176	158	-25.1	149	169	147	-1.5
81	Sanitary, plumbing, heating and lighting fixtures	230	173	137	-40.3	177	129	109	-38.6
82	Furniture	167	144	108	-35.5	122	110	93	-23.5
83	Travel goods, handbags and similar articles	192	155	124	-35.8	168	126	118	-29.7
84	Clothing	199	162	137	-31.3	188	146	118	-37.2
85	Footwear, gaiters and the like	193	203	126	-34.5	151	98	104	-31.0
86	Professional, scientific and controlling instruments	163	136	133	-18.2	161	145	147	-8.4
89	Miscellaneous manufactured articles, N.E.S.	175	137	117	-33.0	149	139	127	-15.1
	Aggregations:								
	aggregates	224	298	186	-17.2	229	200	169	-26.0
	weighted means	226	222	194	-14.5	226	201	190	-9.4
	unweighted means	232	222	187	-19.7	238	208	189	-25.7

As was to be expected from our earlier discussions the largest re-orientations away from Dover are seen for fuel commodities. The centre of gravity for exports of Petroleum and petroleum products started off far from Dover and moved even further away. Exports of Gas (natural and manufactured) show a similar pattern. Three other commodities, (Coal, coke and briquettes; Pulp and waste paper; Hides, skins and furskins undressed) also see the centre of gravities of both exports and imports move further away from Dover although none of the changes are particularly large. Finally, five commodities see their exports re-orientating in the opposite direction to their imports.[6] One should probably not make too much out of the specific commodity patterns, but the generalised nature of the drift towards the South East is quite clear.

Table 5: Top 10 movers 'towards' Dover (exports and imports)

Exports	% change	Imports	% change
Explosives and pyrotechnic products	-66.8	Leather, leather manufactures, N.E.S.	-63.5
Textile fibres not manufactured and their waste	-59.4	Explosives and pyrotechnic products	-60.3
Fish (not of British taking) and fish preparations	-53.7	Textile fibres not manufactured and their waste	-51.6
Textile yarn, fabrics, made-up articles	-50.7	Textile yarn, fabrics, made-up articles	-50.7
Live animals (excluding zoo animals, dogs and cats)	-46.4	Tobacco and tobacco manufactures	-50.5
Plastic materials	-42.6	Cereals and cereal preparations	-41.7
Chemical materials and products, N.E.S.	-42.0	Crude rubber (including synthetic and reclaimed)	-39.4
Crude rubber (including synthetic and reclaimed)	-41.0	Sanitary, plumbing, heating and lighting fixtures	-38.6
Feeding stuff for animals	-40.4	Coffee, tea, cocoa and spices	-38.2
Sanitary, plumbing, heating and lighting fixtures	-40.3	Clothing	-37.2

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[6] These commodities are Beverages; Tobacco and tobacco manufactures; Oil seeds, oil nuts and oil kernels; Wood, lumber and cork; Animal and vegetable fats and waxes.

4. Conclusions

This paper has described a new dataset of British international trade by port of entry or exit and commodity. It offers more detail in both dimensions than has been seen before, although at the expense of losing the data on the country partners involved. In our preliminary results, we have quantified and confirmed a number of tendencies that have been of interest to geographers and economists:

* the increasing share of air transport in UK trade
* the declining port concentration of UK trade
* the dominance of Dover, Felixstowe and Heathrow Airport in manufacturers trade, and
* the general gradual drift towards trading more through the ports on the South East of Britain.

The last is our particular focus of interest, being related, we hypothesise to UK accession to the European Economic Community in 1973. In Overman and Winters (2003) we start to explore the implications of this re-orientation for the location of British industry. In the evidence that we present in this paper, we see the re-orientation clearly in terms of both the main ports used for different commodity trades and the centres of gravity of different trade flows over the period 1970 to 1992.

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Data Appendix

Table A1: Definition of port groups

AIROT OTHER AIRPORTS	ALL OTHER AIRPORTS	**ESCOT** East Scotland	ABERDEEN
	BELFAST AIRPORT		DUNDEE
	GLASGOW AIRPORT		FRASERBURGH
	MANCHESTER AIRPORT		GRANGEMOUTH
	PRESTWICK AIRPORT		KIRKCALDY
AIRLO London Airports	GATWICK AIRPORT		KIRKWALL
	HEATHROW AIRPORT		LEITH
	SOUTHEND AIRPORT		MONTROSE
RESTP Rest of ports	ARDROSSAN		PETERHEAD
	AVONMOUTH	**NEHUM** North East and Humber	BLYTH
	AYR		BOSTON
	BARROW-IN-FURNESS		GOOLE
	BELFAST		GRIMSBY
	CARDIFF		HARTLEPOOL
	COLERAINE		HULL
	DOUGLAS		IMMINGHAM
	ELLESMERE PORT		MIDDLESBROUGH
	FISHGUARD		SCARBOROUGH
	FLEETWOOD		SUNDERLAND
	GLASGOW		TYNE
	GREENOCK		WHITBY
	HEYSHAM	**SSWCO** South West and Cornwall	EXETER
	HOLYHEAD		FALMOUTH
	INVERNESS		FOWEY
	IRISH LAND BOUNDARY		GUERNSEY
	IRVINE		JERSEY
	LERWICK		PAR
	LIVERPOOL		PENZANCE
	LONDONDERRY		PLYMOUTH
	MANCHESTER		POOLE
	MILFORD		TEIGNMOUTH
	MOSTYN		WEYMOUTH
	NEWPORT	**SUHAM** Sussex and Hampshire	COWES
	PORT TALBOT		NEWHAVEN
	RUNCORN		PORTSMOUTH
	SHARPNESS		SHOREHAM
	SILLOTH		SOUTHAMPTON
	STORNOWAY	**HAVEA** Haven and East Anglia	COLCHESTER
	SWANSEA		FELIXSTOWE
	WATCHET		GREAT YARMOUTH
	WHITEHAVEN		HARWICH
	WORKINGTON		IPSWICH
			KINGS LYNN
			LOWESTOFT
			WISBECH
		THAKE Thames and Kent	DOVER
			LONDON
			MEDWAY
			RAMSGATE
			WHITSTABLE

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