Trade with newly industrialised economies

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This article analyses the changing nature of trade between OECD economies and the newly industrialised economies (NIEs) and considers the opportunities and challenges that this presents. It begins by assessing the growth of this trade and its relationship to domestic changes in the NIEs. It then examines the possible effects on the United Kingdom and OECD economies of the growth of trade with the NIEs. The article concludes that the overall effects should be positive, resulting in increased specialisation and growth. While there is some evidence that trade with the NIEs may be having some impact on OECD countries' labour markets, most studies have found that this impact is relatively modest.

Introduction

Over the past 25 years or so, developing countries' share of world output and trade has risen significantly. Between 1970 and 1994, their contribution to world output increased from 28.9% to 40.1%, at an average annual growth rate of 1.4%, while their share of total world trade rose from 18.3% to 26.1% over the same period. Their penetration of industrial countries' markets has also increased. In 1970, OECD[1] imports of manufactured goods from outside the area amounted to 0.6% of OECD GDP. By 1992, this figure had risen to 2.5%.

This increase in trade between the two groups of countries has primarily resulted from an increase in trade between the OECD and a fairly small number of newly industrialised economies (NIEs).

Different groupings of countries are identified as NIEs. The World Bank has identified a number of high-performing Asian economies, including 'The Four Tigers'—Hong Kong, the Republic of Korea, Singapore and Taiwan. These economies have been developing rapidly for a number of decades. Indonesia, Malaysia and Thailand are now also widely regarded as high-performing Asian economies, having had high growth rates for the past two decades or so. In addition, a third wave of Asian NIEs appears to be emerging, including India, China and the Philippines—large Asian countries which have more recently undertaken programmes of economic liberalisation. In this article, these groups are referred to, respectively, as the first, second and third generations of Asian NIEs.

As well as the Asian NIEs, a number of Eastern European[2] and Latin American economies are starting to increase their share of world trade. The three largest economies in each of these two regions—Mexico, Brazil and Argentina in Latin America and Hungary, Poland and the Czech Republic[3] in Eastern Europe—are also examined below. The significance of this broadly defined group of NIEs is illustrated by the fact that their share of total non-OECD imports to the OECD has risen from 44.4% in 1970 to 80.5% in 1992.

The relationship between industrial countries and the NIEs

This section aims to assess the nature of the relationship between industrial countries and the NIEs. Over the last 25 years or so, there have been some significant changes in the economic size and structure of many of the NIEs and this appears to have been reflected in the size and composition of their trade with OECD countries.

Table A presents some selected economic indicators for both OECD and non-OECD countries. It shows that the OECD countries generally have higher GDP per capita than the NIEs, but Hong Kong and Singapore have attained levels comparable to the OECD. Over the past decade or so, most of the Asian NIEs have had much faster growth in GNP per capita, investment and exports than the developed countries. They have also experienced faster growth of real earnings between 1980 and 1993, which perhaps suggests that convergence of wage rates is occurring. But hourly wage rates in manufacturing still remain significantly higher in the OECD countries. It is, in addition, possible to distinguish the first-generation from the other Asian NIEs, since they generally have higher GDP per capita and higher hourly wages. However, during the past decade or so, investment in the second generation Asian NIEs has grown faster.

The Latin American and Eastern European economies generally performed less well over the period since 1980, reflecting the debt problems faced by the Latin American economies in the 1980s and the fact that economic transition in Eastern Europe is so recent. These economies also generally suffered much higher rates of inflation over the

(1) The Organisation for Economic Co-operation and Development consists of all the major industrial countries.
(2) Outside the Former Soviet Union.
(3) Czechoslovakia prior to 1993.

Table A
Selected economic indicators

	Average annual growth (GNP per capita) (1980–93) (c)	GDP per capita (1993) (a) (US = 100) (c)	Manufacturing hourly wage (US$ 1992) (b)	Manufacturing real average earnings per employee 1991 (1980 = 100) (c)	Average annual growth in investment (1980–93) (c)	Average annual growth in exports (1980–93) (c)	Average annual rate of inflation (1980–92) (c)
OECD							
United States	1.7	100.0	11.45	103	2.5	5.1	3.8
Japan	3.4	84.3	18.96	122	5.5	4.2	1.5
Canada	1.4	81.8	12.80	99	3.6	5.6	3.9
Belgium	1.9	79.4	10.63 91	105	3.7	4.5	4.0
France	1.6	76.8	7.88	121	2.1	4.5	5.1
Italy	2.1	72.1	—	179	1.5	4.3	8.8
Netherlands	1.7	70.0	10.44 91	138	2.7	4.7	1.7
United Kingdom	2.3	69.6	10.56	128	4.0	4.0	5.6
Germany (d)	2.1	68.1	14.41	119	2.4	4.2	2.8
First generation Asian NIEs							
Hong Kong	5.4 (e)	87.1	3.28	157	5.0	15.8	7.9
Taiwan (f)	—	—	5.31	—	—	10.0	4.4
Republic of Korea	8.2	38.9	5.25	231	11.8	12.3	6.3
Singapore	6.1	78.9	5.31	187	5.7	12.7	2.5
Second generation Asian NIEs							
Thailand	6.4	25.3	0.67 91	173 90	11.4	15.5	4.3
Indonesia	4.2	12.7	—	171	7.1	6.7	8.5
Malaysia	3.5	32.1	1.41 90	135	6.3	12.6	2.2
Third generation Asian NIEs							
Philippines	-0.6	10.8	0.48 91	180	-0.1	3.4	13.6
India	3.0	4.9	0.34 89	130	5.7	7.0	8.7
China	8.2	9.4	0.26	—	11.1	11.5	7.0
Latin American NIEs							
Argentina	-0.5	33.3	—	69	-1.3	3.2	374.3
Brazil	0.3	21.7	1.82 88	80	-0.3	5.2	423.4
Mexico	-0.5	27.5	2.11	79	0.1	5.4	57.9
Eastern European NIEs							
Czechoslovakia	—	30.5	0.79 91	—	—	—	—
Hungary	1.2	24.5	1.66	115	-1.6	2.3	12.8
Poland	0.4	20.2	1.12 91	78	-1.1	2.8	69.3

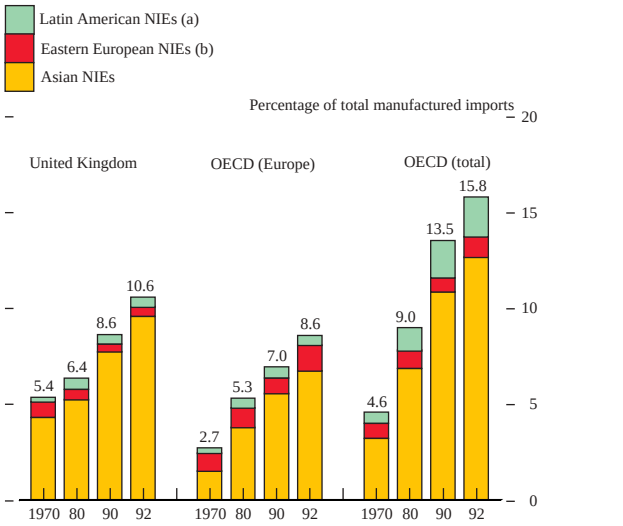
(a) Based on purchasing-power parity.
(b) Source: ILO, Yearbook of Labour Statistics (1993). 1992 data unless otherwise specified.
(c) Source: World Bank, World Development Report (1995).
(d) Data refer to Federal Republic of Germany before unification.
(e) Average annual growth of GDP per capita.
(f) Source: *Monthly Bulletin of Statistics of the Republic of China*.

period, low or negative growth of investment, low growth of exports and low or negative growth of GNP per capita. But GDP per capita and hourly wages in these countries are broadly comparable to those of the second-generation Asian NIEs.

Having examined the industrial and newly industrialised economies, this article now turns to the trade between them. Chart 1 shows UK, OECD (Europe) and OECD (total) manufactured imports from the NIEs as a percentage of their total manufactured imports. Since 1970, manufactured imports from the NIEs have increased significantly as a percentage of the OECD's total manufactured imports. In addition, the chart suggests that this growth in import share has been most rapid for the three generations of Asian NIEs.(1) It is possible to distinguish the different generations of Asian NIEs, as the rate of growth in import share of the first generation of Asian NIEs has been overtaken in the last ten years by that of the second and third generations.

The Eastern European and Latin American countries have also started to make progress. Between 1980 and 1992, the share of total OECD manufactured imports accounted for by Brazil, Argentina and Mexico rose from 1.3% to 2.1%.

Chart 1
UK, OECD (Europe) and OECD (total) manufactured imports from the NIEs

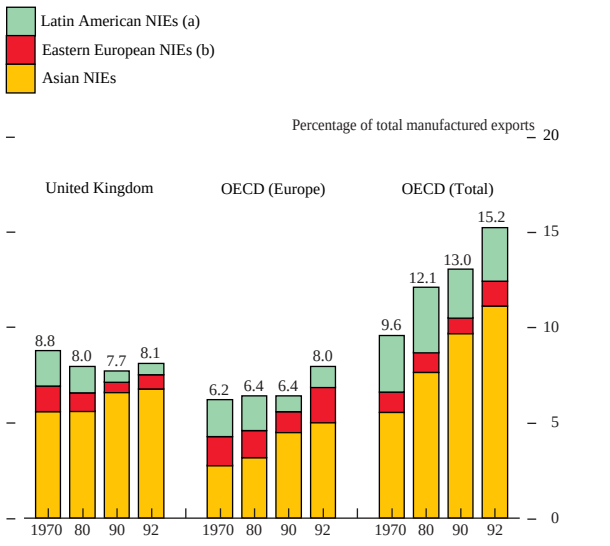


(a) Brazil, Argentina and Mexico.
(b) Hungary, Poland and the Czech Republic.

Although the share from Poland, the then Czechoslovakia and Hungary declined from 0.9% to 0.7% between 1980 and 1990, these economies are recovering quickly after their market reforms and by 1992 their share returned to 1.0%.

As well as an increase in OECD imports from the NIEs, there has also been a rise in OECD exports to the NIEs, as the rapid growth of these markets provides increasing opportunities for OECD producers. As Chart 2 shows, the Asian NIEs accounted for rising shares of UK, OECD

Chart 2
UK, OECD (Europe) and OECD (total) manufactured exports to the NIEs



(a) Brazil, Argentina and Mexico.
(b) Hungary, Poland and the Czech Republic.

(Europe) and OECD (total) manufactured exports between 1970 and 1992. If NIEs are defined more broadly to include the Latin American and Eastern European countries considered above as well as the Asian NIEs, their share of

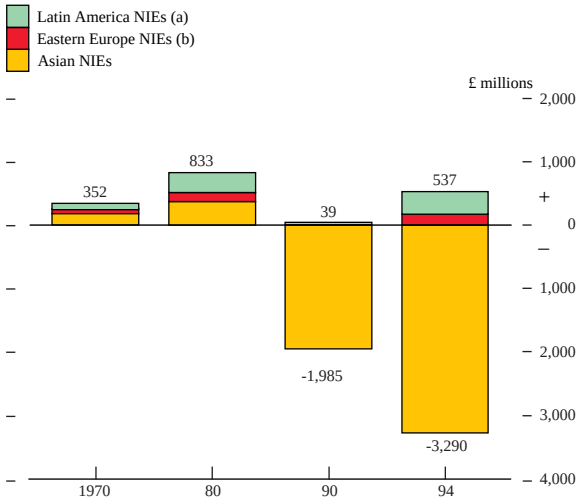
(1) There is a very similar pattern in the growth of imports from these NIEs as a percentage of UK, OECD (Europe) and OECD (total) GDP.

the OECD's manufactured exports rose by around 50 per cent between 1970 and 1992. Over this period, the OECD as a whole had a higher share of manufactured exports to the NIEs than OECD (Europe), largely the result of a higher export share for Japan. The share of UK manufactured exports to the more broadly defined NIEs fell slightly between 1970 and 1990, although by 1992 it had increased to just above its 1980 level.

Charts 3 and 4 show the balance of trade in manufactures between the NIEs and the OECD and United Kingdom. Between 1980 and 1990, both UK and OECD trade with the Asian NIEs shifted from surplus to deficit. The UK and OECD trade surplus with the Latin American countries also declined over the period. The United Kingdom recorded a small trade deficit with the three Eastern European economies in 1990 while the OECD trade surplus with these countries increased. In the early 1990s, both the OECD and the United Kingdom saw improvements in the balance of their trade in manufactured goods with the major Eastern European and Latin American economies.

Whereas the United Kingdom has a trade deficit with the Asian NIEs in manufactures, it has a trade surplus in services, as shown in Chart 5. Between 1988 and 1994, the first-generation Asian NIEs' share of UK service credits declined slightly from 4.1% to 3.9%. However, the ASEAN(1) countries' share rose from 3.0% to 3.4% over the period, as this market has grown rapidly. In addition, Chart 6 shows that, even though OECD imports of manufactures from the NIEs have grown rapidly, these countries have not accumulated large current account

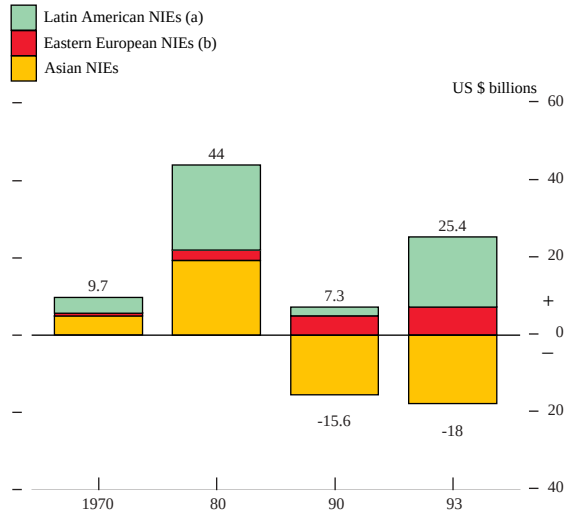
Chart 3
Balance of trade in manufactures between United Kingdom and NIEs



\+ indicates a surplus for the United Kingdom.

(a) Brazil, Argentina and Mexico.
(b) Hungary, Poland and the Czech Republic (Czechoslovakia prior to 1993).

Chart 4
Balance of trade in manufactures between the OECD and NIEs



\+ indicates a surplus for the OECD.

(a) Brazil, Argentina and Mexico.
(b) Hungary, Poland and Czechoslovakia.

Chart 5
Balance of trade in services with Asian NIEs

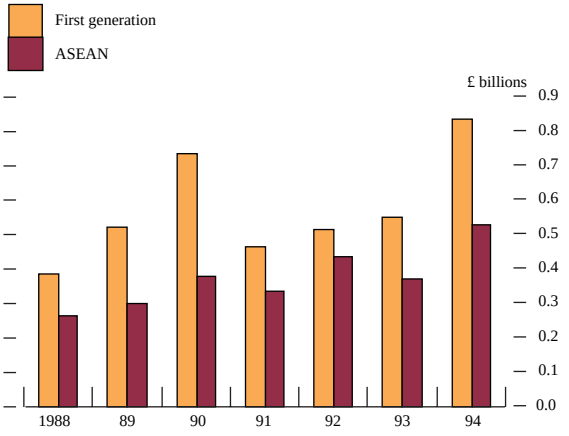
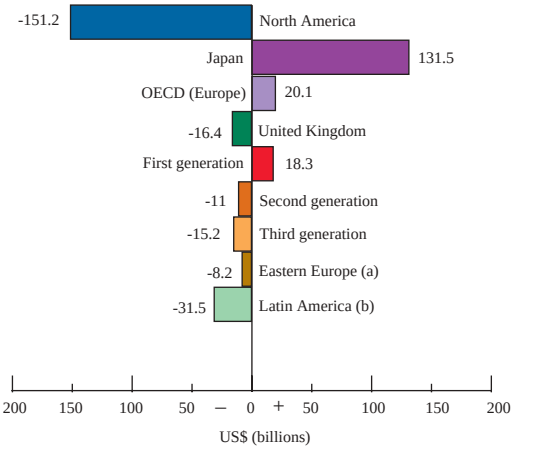


Chart 6
Current account balances (1993)



(a) Hungary, Poland and the Czech Republic.
(b) Brazil, Argentina and Mexico.

(1) Indonesia, Thailand, Malaysia, Philippines, Brunei and Singapore. There is no data to show the United Kingdom's current account position with these countries individually.

surpluses and, in fact, all but the first-generation Asian NIEs had current account deficits in 1993. And, in 1994, the United Kingdom had current account surpluses with both the first generation Asian NIEs and the ASEAN countries.

The growth in OECD trade with the NIEs has coincided with a sharp decline in the costs of transport and communication and also with changes in the domestic policies of many NIEs, away from import substitution and towards export promotion. These policy changes have been reflected in a general increase in the outward orientation of these economies. According to a number of studies of the Republic of Korea, Malaysia, Indonesia and Thailand, protectionist measures were reduced during the 1970s and 1980s.(1) As a measure of the openness of OECD and newly industrialised economies, Table B provides the sum of their exports and imports as a percentage of total GDP. It reveals

Table B
Openness of economy

Sum of exports and imports as a percentage of GDP

	1972	1982	1992
OECD average (a)	40	52	48
United Kingdom	32	40	39
United States	9	15	17
Asian NIEs			
Hong Kong	122	146	252
Singapore	192	321	279
Taiwan	—	—	71
Republic of Korea	39	62	51
Thailand	31	42	66
Indonesia	29	41	48
Malaysia	63	91	139
Philippines	30	36	48
India	7	13	16
China	—	15	36
Eastern Europe			
Hungary	67	77	61
Poland	—	33	35
Czechoslovakia	—	66	82
Latin America			
Mexico	10	21	23
Argentina	11	15	12
Brazil	15	15	14

Source: *International Financial Statistics Yearbook* 1994 and 1995.

(a) Unweighted mean (excluding Turkey).

a similar pattern to the growth of OECD trade with the NIEs, which significantly increased first with the four Asian tigers and then, somewhat later, with the second-generation and, to a lesser extent, the third-generation Asian NIEs. The Eastern European economies appear to be more open than the Latin American economies, perhaps because they are generally smaller.

As well as an increase in trade between the OECD and the NIEs, the past 20 years or so has also seen a change in the nature of this trade. Whereas in 1970 around 42% of Asia's exported goods were manufactures, by 1990 this figure had risen to 74%.(2) These changes in the composition of trade are mirrored in the newly industrialised countries' domestic economies. As the NIEs have grown, the structure of their economies has evolved, with fewer resources being devoted to agriculture and more to manufacturing. For example, between 1965 and 1988, the share of agriculture in the output of East Asia fell from 41% to 22%.(1) The reasons for these changes are complex, but are likely to be linked to the acquisition of new capital, technology and skills, which have allowed the NIEs over time to move up the product chain, away from agriculture and towards manufacturing.

In general, one would expect that economies at similar stages of development would tend to trade in similar products. The Heckscher-Ohlin theory predicts that a region will specialise in and export those goods and services that make relatively intensive use of the factors of production with which it is relatively well endowed. However, as countries develop, they can invest in new factors of production, such as capital and skill, and so augment their initial endowments. So, countries at similar stages of development will generally have acquired similar proportions of the factors of production. This means that they will tend to specialise in the production of similar products so that trade between them will mainly take place in goods produced in broadly the same industries—the incentive to trade will be based on imperfect competition between them and on economies of scale. By contrast, trade between countries at different stages of development will be predominantly inter-industry, since the relative supplies of their factors of production will tend to differ, giving the countries a comparative advantage in specialising in different industrial sectors.

The facts appear to support this theory. Wage rates should increase as countries develop and their skill levels rise. Chart 7 plots estimated hourly wage rates for the NIEs and a number of OECD countries against an index—the Grubel-Lloyd index(3)—of the extent of intra-industry trade between each country and the United Kingdom. It shows that as wages rise towards UK levels, so does the proportion of trade with the United Kingdom that is intra-industry. Table C shows the Grubel-Lloyd index for the United Kingdom's trade with the OECD and with different groups of NIEs. It shows that, as expected, those NIEs which have been developing longest tend to trade more with the United Kingdom in broadly similar products, reflecting their acquisition of similar relative supplies of factors of production over time.

(1) Source: *The East Asian Miracle*, World Bank, 1993.
(2) Source: *World Economic Outlook*, IMF, October 1995.
(3) The Grubel-Lloyd index measures the proportion of one country's trade (with one, a subset or all foreign countries) that is accounted for by trade in products within the same industry (ie intra-industry trade). It is calculated as:

$$GLI_j = \frac{\sum_i^n \left[(x_i + m_i) - |x_i - m_i| \right]}{\sum_i^n (x_i + m_i)}$$

where x_i and m_i are the total exports and imports between the United Kingdom and country or region j in industry i and where there are a total of n industries, measured here at the two digit Standard International Trade Classification (SITC) level. The index varies between 0 (no intra-industry trade) and 1 (only intra-industry trade).

Chart 7
Estimated hourly wages and the Grubel-Lloyd index (1992)

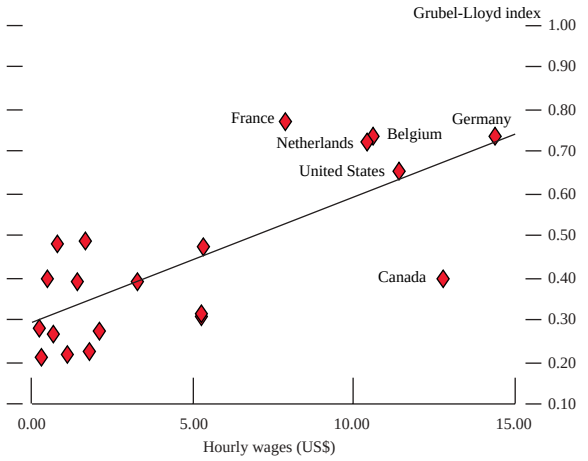


Table C
Grubel-Lloyd index(a) for trade with the United Kingdom by region

Region	Grubel-Lloyd index
OECD	0.83
First generation Asian NIEs (b)	0.48
Second generation Asian NIEs (b)	0.37
Third generation Asian NIEs (b)	0.33
Eastern Europe 3	0.40
Latin America 3	0.33

(a) Defined in footnote (3) on page 72.
(b) Defined in the introduction.

Human resources

Over time, the NIEs have not only switched resources from agriculture to manufacturing, but, to varying degrees, they have also gradually evolved from low-skilled manufacturing towards high-skilled manufacturing. This is consistent with an increasing supply of skilled labour in the NIEs, which has been created through, for example, investment in education. Over time, their comparative advantage is gradually switching away from lower-skilled industries and towards higher-skilled industries. Table D presents three general measures of skill levels from educational data.

According to these measures, OECD countries generally appear to have lower illiteracy rates and higher school enrolment ratios than the NIEs. However, illiteracy rates measure only one basic aspect of skill and enrolment ratios relate to people who have yet to enter the workforce. An alternative measure of the endowment of skilled labour was provided by Barro and Lee (1993), who constructed measures of the stock of human capital by looking at the proportion of the population aged over 25 that had attained different levels of education (see Table E).

These estimates suggest that OECD and Formerly Centrally Planned Economies (FCPEs) have the highest stock of human capital, but a major problem with such data is that it does not reflect the quality of the education. Two commonly used (though imperfect) proxies of educational quality are government expenditure on education as a percentage of GNP and the primary school pupil-teacher ratio. As Table D shows, these two measures generally support the view that the quality of education is highest in OECD and FCPE countries.

Table D
Educational data

	Illiteracy	Enrolment ratios (a)		Education quality proxies	
	Per cent (a) (1990)	Primary and secondary (1991)	Tertiary (1991)	Government Expenditure on education as a percentage of GNP (1991) (a)	Primary pupil/ teacher ratio (1991) (b)
United Kingdom	—	95 90	27.8 90	5.9 90	20
United States	0.5 79	99 89	76.2	5.3 89	. .
Japan	—	98 89	31.3	4.7 89	21
Canada	3.4 86	106 90	98.8	7.4 90	15
France	—	104	40.0	5.8	12
Western Germany (c)	—	107 90	36.1 90	4.1 90	17
Italy	2.9	82	31.7	3.1	12
Holland	—	99 90	37.6 90	6.3 90	17
Belgium	—	101	38.2 90	5.2	10
Hong Kong	11.9 71	88	17.6 89	3.0 90	27
Taiwan (d)	7.6	92	21.0	5.5	27
Republic of Korea	3.7	97	39.9	4.1	34
Singapore	17.1 80	87 89	11.8 84	3.4 88	26
Thailand	7.0	62 90	16.3 89	3.8 90	18
Philippines	6.4	97	27.8	3.0	33
Malaysia	21.6	76	7.3 90	5.6	20
Indonesia	18.4	81 89	9.5	0.9 88	23
India	51.8	68 90	6.7 87	3.1 89	60
China	22.2	86	1.6	2.3	22
Argentina	4.7	96	43.4	1.5	18
Brazil	18.3	89	11.7	4.6 89	23
Mexico	12.4	85	15.2 90	4.5	30
Czechoslovakia	—	90	16.3	3.5	. .
Hungary	1.1 80	86	15.3	6.1 90	12
Poland	1.2 79	94	21.5	4.6	17

. . not available.

Note: Enrolment ratios may be greater than 100 because some pupils are older or younger than the standard school ages.

(a) Source: UNCTAD, *Handbook of International Trade and Development Statistics*, 1993.
(b) Source: World Bank, *World Development Report*, 1994.
(c) Primary pupil/teacher ratio data is for Eastern and Western Germany.
(d) Source: *Monthly Bulletin of Statistics of the Republic of China*.

Overall, it would appear that the OECD is relatively well endowed with higher-skilled labour and the NIEs with lower-skilled labour, but the FCPE countries also appear to be well endowed with higher-skilled labour. But this position is not static: the extent of investment in human capital has been cited as an important factor in the development of some of the NIEs, a view which is given some support by 'endogenous growth' theories, which stress the important role of human capital in stimulating growth.(1) Indeed, between 1960 and 1985, the fastest rate of growth in years of schooling of the population aged over 25 occurred in the East Asian economies, which include the first and

Table E
Highest educational level attained (1985)

Percentage of population aged over 25 years

	No school	Primary	Secondary	Higher	Average years' schooling
Latin America	22.4	56.6	13.9	7.1	4.47
Eastern Asia (a)	23.6	51.3	18.8	6.3	5.19
South Asia	69.0	13.7	14.1	3.2	2.81
FCPEs	2.3	36.1	51.9	9.8	9.17
OECD	3.3	37.7	40.8	18.2	8.88

Source: Barro, R and Lee, J, 'International comparisons of educational attainment', *Journal of Monetary Economics*, 32, 1993, pages 363–94.

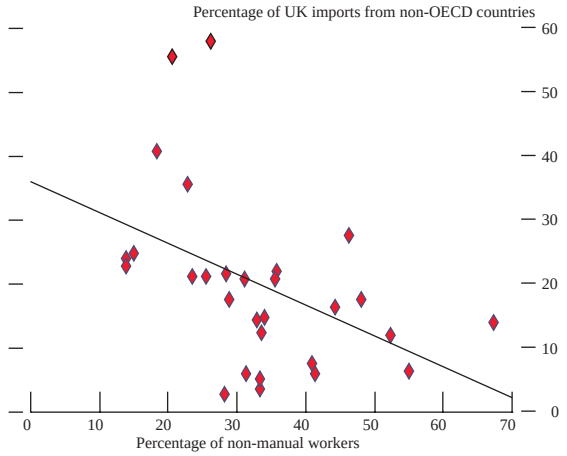
(a) Includes first and second generation Asian NIEs.

(1) See for example Romer, P, 'Increasing returns and long-run growth', *Journal of Political Economy*, 94:5, pages 1,002–37, October 1986.

second generation Asian NIEs. In addition, in comparative cognitive tests of school children, those in first-generation Asian NIEs often perform strongly, matching—or even exceeding—the performance of some OECD countries.(1)

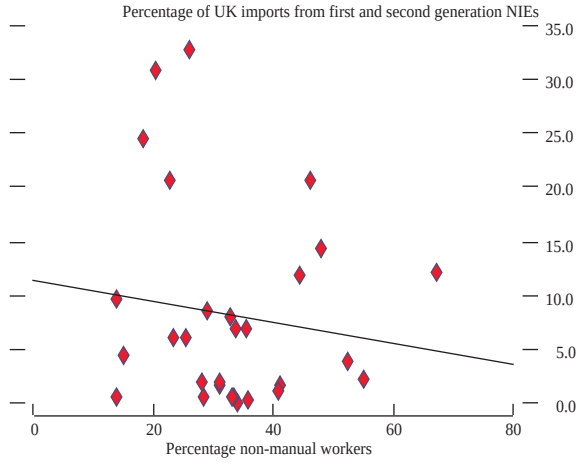
Table D shows that, despite this apparently rapid increase in the quantity of skilled labour in the first and second generation Asian NIEs over the period, they do not yet appear to have reached the levels of the OECD countries. Given this evidence, the Heckscher-Ohlin theory would predict that UK imports from OECD countries would tend to be greater in products requiring relatively higher skills and, by contrast, imports from the NIEs would tend to be greater in products requiring relatively lower skills. Charts 8 and 9 show a proxy for higher skill levels—the percentage of non-manual workers employed—in 28 mainly manufacturing industries. These are plotted against the industries' share of UK imports from non-OECD and from the first and second-generation NIEs.(2)

Chart 8
Share of total UK imports from non-OECD countries in 1992 and the percentage of non-manual workers by industry



The line is based on a simple regression.

Chart 9
Share of total UK imports from first and second generation NIEs in 1992 and the percentage of non-manual workers by industry



The line is based on a simple regression.

The charts show that, as the proportion of non-manual workers in an industry increases, the share of imports from non-OECD countries and the first and second-generation NIEs decreases. The industries where the share of imports is highest, from both non-OECD countries and the first and second-generation Asian NIEs, are clothing, leather, fur and travel goods and footwear—all of which are industries with relatively low-skilled workers.

However, Chart 9 shows the relationship is seemingly less strong for the first and second-generation Asian NIEs. This may illustrate the dynamic nature of the gains from trade. The first and second-generation NIEs have been growing strongly for a number of years and have invested heavily in human and physical capital. During the 1980s, some of the fastest growing UK imports from the Asian NIEs were for high-technology products, such as electronic equipment and office machinery.

Despite this pattern changing over time, Chart 9 also suggests that the share of UK imports from the first and second-generation Asian NIEs still tends to be greater in the products of relatively lower-skilled industries.

It is difficult to be precise about the skill content of UK imports from non-OECD countries. Because the production of many goods is split into stages, it is increasingly feasible, as transport costs have fallen, for firms to locate different stages of production in different countries. The higher-skill stages can be performed in skill-rich regions and the components then transported to relatively lower-skilled, labour-rich regions for final assembly.

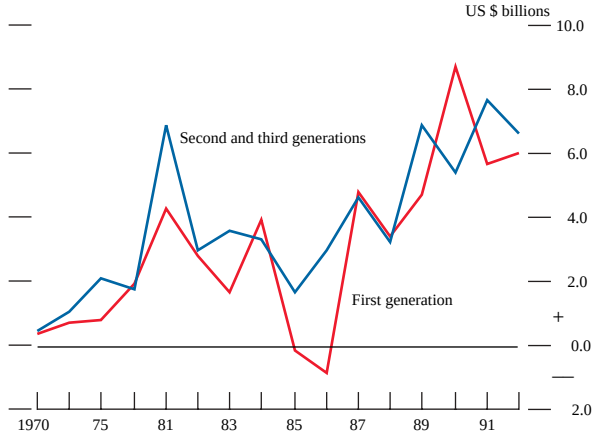
Capital flows

Theories of economic development often stress the role of capital accumulation. If it is assumed that OECD countries are relatively well-endowed with capital and that capital is relatively scarce in the NIEs, then the marginal return on capital must be less in OECD countries than in the NIEs. So OECD countries would find it advantageous to lend savings to the NIEs rather than invest all their savings domestically. By contrast, the NIEs may not to have enough savings to take advantage of all their domestic investment opportunities. They would consequently benefit from borrowing from OECD countries and expanding investment up to the point where the marginal efficiency of investment is equal to the world interest rate.(3) We would therefore expect to see a flow of capital from the OECD, where returns would be relatively low, to the NIEs, where returns would be relatively high.

This theory suggests that net capital flows from the OECD to the NIEs would be positive. Chart 10 shows that this was

(1) Source: *The East Asian Miracle*, The World Bank, 1993.
(2) These figures are estimates based on broadly matched Standard International Trade Classification and Standard Industrial Classification data.
(3) See, for example, the two-gap model of Chenery, H B and Bruno, M, 'Development Alternatives in an Open Economy: The Case of Israel', *Economic Journal*, 1962.

Chart 10
Net private capital flows from DAC countries to the Asian NIEs (1970–92)



Source: *Key Indicators of Developing Asian and Pacific countries*, Asian Development Bank, 1994 and *UNCTAD Handbook of International Trade and Development Statistics*, 1992.

the case for total net private capital flows from the DAC[1] group of OECD countries to the Asian NIEs between 1970 and 1992. And these net outflows appear to have increased over the period. In 1992, China received $11 billion in foreign direct investment—the largest such inflow to any developing country.

The implications of trade with the NIEs

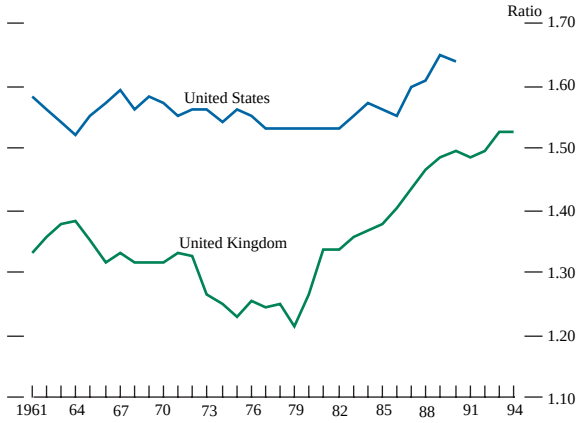
What are the implications for the OECD economies of the significant changes to the size and nature of trade between the OECD and the NIEs?

Both NIEs and OECD countries should benefit from increased trade. Trade stimulates more efficient allocation of resources between the regions, since it allows each to concentrate on producing the goods and services in which it has a comparative advantage. It can then obtain the other products it requires through trade. As a result, output in both regions will increase and, in addition to these efficiency gains, output will no longer be constrained by the size of the domestic market. Not only will each region be able to produce and sell more, but both will be able to obtain goods and services from the other region at a lower resource cost than could be achieved domestically.

The increase in trade between OECD countries and the NIEs seems to have coincided with important structural changes in OECD economies, including an apparent decline in the relative demand for lower-skilled labour. In the United States and United Kingdom, this seems to have taken the form of an increase in wage inequality between higher and lower-skilled labour since the late 1970s, as illustrated in Chart 11. It shows the ratio of non-manual to manual workers' wages in the United Kingdom and the ratio of non-production to production workers' wages in the United States.

In many OECD countries, a fall in the relative demand for lower-skilled workers appears to have led to an increase in

Chart 11
Ratio of non-manual to manual workers' wages in the United Kingdom and non-production to production workers' wages in the United States



Source for US data: Sachs, J D and Shatz, H J, 'Trade and Jobs in US manufacturing', *Brookings Papers on Economic Activity*, 1, 1994.

their unemployment levels, compared to higher-skilled workers. As Table F shows, with the exceptions of Australia and Canada, there has been a higher proportionate increase in male unemployment among less educated members of the workforce than among more highly educated members in all the OECD countries. This is consistent with a fall in demand for unskilled workers relative to supply, without the full adjustment of wages that would be required to maintain full employment.

Table F
Male unemployment rates by educational attainment

Country and age group		Lower secondary or less	Upper secondary or higher	Ratio
Australia (25–54)	1982	5.8	2.3	2.50
	1990	7.1	3.2	2.26
Canada (25 and over)	1979	6.8	3.8	1.80
	1990	11.0	6.3	1.74
France (25–64)	1979	3.7	2.6	1.40
	1990	8.3	4.1	2.02
Western Germany (25–54)	1978	4.1	1.8	2.25
	1987	14.6	5.0	2.91
Italy (25–64)	1980	1.6	3.4	0.47
	1989	4.7	4.6	1.04
Japan (25–64)	1979	2.7	1.5	1.87
	1992	3.0	1.6	1.90
United Kingdom (25–55)	1979	5.4	2.2	2.49
	1990	8.7	3.3	2.68
United States (25–64)	1979	6.6	3.2	2.06
	1989	9.7	3.9	2.51

Data not available for NIE countries.

Source: *The OECD Jobs Study* (1994).

Table G illustrates recent changes in sectors' shares of total manufacturing employment in the United Kingdom, with the industries ranked by the proportion of their workers that are non-manual. It shows that the three industries with the highest proportion of non-manual workers all increased their share of manufacturing employment between 1971 and 1994. Of the other eight sectors, only two increased their share of manufacturing employment.

(1) Development Assistance Committee of the OECD. As of 1992, this comprised all Member States of the OECD with the exceptions of Greece, Turkey, Luxembourg and Iceland.

Table G
Share of total manufacturing employment in the United Kingdom by industry

Industry	1971	1994	Change	Per cent of non-manual workers 1994	Per cent of imports from non-OECD countries (1992)
Chemicals and other man-made fibres	5.6	6.7	1.1	55	6.4
Paper products, publishing etc	7.3	10.8	3.5	55	—
Office machinery, electrical engineering and instruments	13.0	14.3	1.3	52	17.1
Mechanical engineering	14.4	13.9	-0.5	41	5.8
Other transport equipment	5.4	4.0	-1.4	41	7.7
Metal goods not elsewhere specified	7.2	6.3	-1.0	33	14.3
Metal manufacturing, ore and other mineral extraction	10.4	6.8	-3.6	32	13.2
Timber, wooden furniture, rubber, plastics etc	7.8	11.2	3.4	31	20.9
Food, drink and tobacco	9.8	11.2	1.4	31	20.7
Motor vehicles and parts	6.4	4.7	-1.7	28	2.9
Textiles, leather, footwear and clothing	12.8	10.1	-2.7	22	39.5

There are a number of possible explanations for these structural changes in OECD labour markets. One possibility is that it may be linked to the increase in trade with developing countries and, in particular, the NIEs. According to Stolper and Samuelson,(1) a refinement of the Heckscher-Ohlin theory provides a framework for analysing the effect that trade has on the returns to the factors of production in the two regions. This theory claims that as trade increases, there is increased demand for a region's exported good, and its price rises. Since OECD countries appear to have a relatively large supply of higher-skilled labour, the Heckscher-Ohlin theory predicts that they will tend to export goods that use higher-skilled labour relatively intensively. As the price of these exports increases, firms will wish to produce more and so will require more higher-skilled labour. There will be the opposite effect on the demand for lower-skilled labour as the supply of imported goods rises, lowering their prices.

The implication of this for OECD labour markets is that the wages of higher-skilled labour will rise relative to those of lower-skilled labour. In the simple versions of this model, the overall employment of higher and lower-skilled labour is assumed to remain unchanged. However, if, for example, there are labour market imperfections or lags in the process of labour market adjustment, it may be the case that, in the short run, some mix of lower wages and lower employment will be the outcome for lower-skilled labour in the OECD. Nevertheless, any such changes in employment should prove temporary since, over time, the labour market should adjust.

In the NIEs, the outcome is reversed, with the wages of lower-skilled labour increasing and those of higher-skilled labour falling. Relative factor prices are therefore equalised across regions as the relative wages of higher-skilled labour rise in the OECD and fall in the NIEs, and the relative wages of lower-skilled labour fall in the OECD and rise in the NIEs. In reality, such adjustments may be imperfect or slow.

It is important to stress that the theoretical framework does *not* imply that there will be an decrease in *aggregate* demand in the OECD, following an increase in trade with the NIEs. Indeed, the fact that the NIEs have current account deficits or relatively small surpluses suggests that their trade has not contributed to a reduction in aggregate demand in OECD countries. Rather, the theoretical framework is concerned with changes in *relative* demand, for lower and higher-skilled labour.

Another important caveat to this theory is necessary: the theoretical framework outlined above is essentially a two period model—in the first period there is no trade and in the second free trade. Reality is much more complex. In particular, it is possible for countries to alter their endowments of the factors of production over time and this process is particularly evident in the Asian NIEs. The first-generation Asian NIEs have invested heavily in education, raising their supply of higher-skilled labour above that of other Asian NIEs. This has been reflected in the nature of their trade with the OECD, which now tends to be more intra-industry (ie in similar, but different goods), than OECD trade with other Asian NIEs. They also have a greater proportion of higher-skilled manufacturing exports than other non-OECD countries. Hourly wages are also somewhat higher than in the other NIEs and earnings have grown rapidly. All this suggests that the first-generation Asian NIEs have been able to increase their supply of higher-skilled labour. Were this process to continue, the first generation of NIEs would increasingly have a comparative advantage in production of skilled-labour intensive goods and trade with the OECD would be predominantly intra-industry. The theoretical framework outlined here would no longer be appropriate for analysing trade with the first-generation NIEs, as it relies on differences in endowments of the factors of production. It would, though, remain relevant for later generations.

Although this theory predicts that lower-skilled workers in the OECD may experience a decline in their relative wages, consumers of imported goods should benefit because, as the supply of imports increases, their prices should fall. This could imply that, even if the nominal wages of lower-skilled workers do decline following an increase in trade, they may still be better off in real terms if the price of their consumption basket falls as a result of cheaper imports.

The mechanism through which the labour market is ultimately affected by increased trade between OECD countries and the NIEs is through changes in import and export prices. The international prices of higher-skilled, labour-intensive goods should increase in OECD countries, whereas the international prices of lower-skilled, labour-intensive goods should fall. However, studies have generally found that this is either not the case or the effect is not large enough to explain the observed widening of wage inequalities.(2) Another prediction of the theoretical framework is that the ratio of higher to lower-skilled

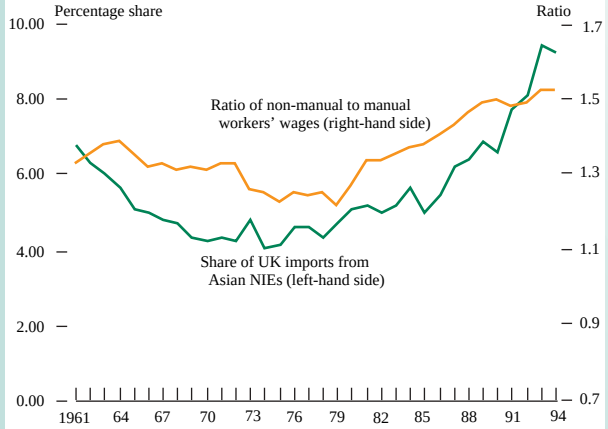
(1) Stolper, W and Samuelson, P A, 'Protection and real wages', *Review of Economic Studies*, November 1941, pages 58–73.
(2) See for example, Sachs, J and Shatz, H, 'Trade and jobs in US manufacturing', *Brookings Papers on Economic Activity*, 1, 1994, pages 1–84.

What has caused the increase in the ratio of non-manual to manual workers' wages ?

This box investigates a number of different factors contributing to the rise in the ratio of non-manual to manual workers' wages in the United Kingdom. The theoretical framework used in the main article predicts that, following an increase in trade between two regions with different factor endowments, factor prices would tend to equalise. Lower-skilled labour wages would tend to fall in the United Kingdom and rise in the NIEs, whereas higher-skilled labour wages would tend to rise in the OECD and fall in the NIEs. However, there are a number of other plausible explanations, including the impact of technological progress and labour market reforms.

The increase in the ratio of non-manual to manual workers' wages appears to have begun around the early 1980s. By contrast, the increase in the share of UK imports from the Asian NIEs (used to proxy for all the NIEs) appears to have begun around the early to mid 1970s (see the chart). However, the mid to late 1970s was a period characterised by incomes policy. In particular, some form of incomes policy was in place from late 1972 until 1979. These policies made exemptions for the low paid, who tend to be manual workers. In addition, incomes policies generally have a greater impact on public sector workers, who are predominantly non-manual in nature. These factors may help to explain the decline in the ratio of non-manual to manual workers' wages during that period. They may also have overwhelmed any impact on wage inequality from increasing competition with the NIEs.

Ratio of non-manual to manual workers' wages and the share of UK imports from the Asian NIEs



(a) Source: New Earnings Survey.
(b) Source: Overseas Trade Statistics of the United Kingdom.

As well as incomes policy, the ratio of non-manual to manual workers' wages may also have been influenced by changes in the structure of the labour market. In particular, there were a series of labour market reforms in the early 1980s, which included changes to trade union laws. Trade union membership has declined sharply since the early 1980s, particularly among manual workers.

An increase in technology may be expected to reduce the demand for manual workers relative to that for non-manual workers. New technology will often be used as a substitute for manual labour; as a result its introduction will tend to increase non-manual wages relative to manual wages.

Empirical results

In order to assess tentatively the impact of these various factors on the ratio of non-manual to manual workers' wages, an equation is estimated over the sample period 1961 to 1993. The coefficients from this equation represent long-run elasticities for each explanatory variable with respect to the ratio of non-manual to manual workers' wages. A dummy variable (D) was included to allow for the effects of incomes policy over the period 1973 to 1979. The estimated long run relationships are given by the equation below:

$$NMM = -0.24 + 0.07\,PM + 0.17\,IMP - 0.11\,TUM - 0.72\,D^{(1)}$$

$$(-0.23)\quad (3.32)\quad (2.93)\quad (-0.38)\quad (-3.57)^{(2)}$$

where *NMM* is the ratio of non-manual to manual workers' wages, *IMP* is the share of total imports to the United Kingdom from the Asian NIEs, *PM* is investment in plant and machinery at constant prices, as a crude proxy for an increase in technology, and *TUM* is trade union membership, as a proxy for labour market reforms (all measured in logs).

These results suggest that, in this simple framework, both increases in technology and the rising share of imports from the Asian NIEs have had a significant impact on the relative wages of non-manual and manual workers in the United Kingdom.

In general, studies of the impact of imports on demand for lower-skilled labour have found some effect, but not enough to explain all of the observed changes in wage inequality and relative unemployment. This is often attributed to the fact that, although imports from the NIEs have increased, they are still of a relatively small magnitude in terms of OECD GDP. Technological progress is therefore often seen as a significant explanation.(3)

(1) Estimated using the Autoregressive Distributed Lag approach, ARDL(1,0,0,1) selected using Schwarz Bayesian Criterion. This approach identifies the appropriate long-run relationship between the variables by analysing various combinations of lags.
(2) Long-run *t*-ratios.
(3) See, for example, Lawrence, R and Slaughter, M, 'International trade and American wages in the 1980s: giant sucking sound or small hiccup?', *Brookings Papers on Economic Activity*, Microeconomics 2, 1993, pages 161–226.

workers employed should decline in all industries as trade with the NIEs increases. This is because industries economise on the use of higher-skilled labour as their relative wages increase. Full employment is, nevertheless, maintained because the output of the sector that uses higher-skilled labour relatively intensively has increased. In fact, a number of studies have found this not to be the case and that this ratio has actually risen.(1) Also, Table G shows that there does not appear to be an obvious relationship between the changing employment pattern in the United Kingdom and the sectoral share of imports from the non-OECD countries, suggesting that other factors may have been important.

If increased trade between the OECD and the NIEs leads to rising wages for higher-skilled workers relative to lower-skilled workers in the OECD, it could also be expected to have had the opposite effect in the NIEs. However, the experience of a number of NIEs contradicts this expectation. Between 1985 and 1988, the ratio of non-production to production workers' wages in Mexico's maquiladora(2) enterprises increased from 2 to 2.5. In addition, between 1980 and 1990, the wages of university graduates in Chile rose by 56% relative to those of high school graduates.(3)

So, there are a number of facts that appear to be inconsistent with the theoretical framework, implying that international trade may not be the major cause of growing wage inequalities in a wide variety of countries. One possible alternative explanation for this divergence in wages is technological progress, which enables capital equipment (eg computers) to substitute for lower-skilled labour. This would also be expected to cause a decline in the relative demand for unskilled labour, but not necessarily just in OECD countries. In order for technology to explain the recent decline in demand for unskilled labour, it must be the case that this new technology is biased against unskilled labour and that, over the past few years, it has had a greater impact on the demand for unskilled labour than previously. A number of studies have suggested that increased computer usage in the 1980s fits this profile and have found it to be correlated with the decline in demand for unskilled labour in some OECD countries.(4)

It is possible that the trade and technology explanations for the decline in demand for unskilled labour may be related. For example, firms which face increasing competition may engage in 'defensive innovation'—investing in new technology in order to increase their productivity and remain competitive. This would make it very difficult to isolate the effect of technology alone.

It is also possible that certain labour market reforms, such as the reduction in trade union power, may have had a disproportionate impact on the wages and employment of unskilled labour. The box on page 77 presents some tentative estimates of the extent to which technology, labour market reforms and the share of imports from the Asian NIEs may each have affected the ratio of non-manual to manual workers' wages.

Implications for the future

Although OECD trade with the NIEs is increasing, it is still quite low, both as a share of total trade and as a percentage of OECD GDP: most OECD trade is with other OECD countries. However, given that the share is rising rapidly, what are the likely implications of the rapid growth in trade between the OECD and the NIEs?

Economic theory suggests that the growth in trade with the NIEs will bring about some short-run frictions in the OECD economies. There will be an increase in the relative demand for those resources required to produce goods and services in which the OECD economies have a comparative advantage. There may be a temporary increase in lower-skilled workers' unemployment, but utilising comparative advantage means that resources will be allocated more efficiently, improving global welfare. Growth will be higher both within the OECD and in the NIEs.

The United Kingdom has experienced a shift of resources away from lower-skilled, labour-intensive, manufacturing sectors and towards higher-skilled manufacturing and service industries. As the NIEs' domestic economies grow, their demand for imports is also likely to increase, leading to higher demand for UK exports of goods and services. In addition, the United Kingdom currently runs a current account surplus with many of the Asian NIEs.

The changing scale and nature of OECD trade with the NIEs appears to be closely linked to the changing structure of their domestic economies. As the NIEs have developed, they have been able to alter their supplies of the factors of production such as capital stock and skill levels, and over time this seems to have been reflected in the type of products in which they trade with OECD countries. In particular, as their capital stocks and skill levels grow, their trade increasingly takes place in similar industries to those in which OECD countries have specialised.

In conclusion, while there is some evidence that trade with the NIEs may be having some adverse impact on demand for lower-skilled labour in OECD countries, most studies have found that this impact is relatively modest and that other factors, such as technology, may have played a significant role. Increased trade with NIEs can be expected to deliver benefits to OECD countries by making it possible for production to be increasingly specialised internationally and for economic growth to be faster as a result.

(1) See for example, Bound, J and Johnson, G, 'Changes in the structure of wages in the 1980s: an evaluation of alternative explanations', *American Economic Review*, June, 1992, pages 371–92.
(2) Maquiladora industries are exempt from import and export duties.
(3) Source: *World Development Report*, World Bank, 1995.
(4) See for example Machin, S, 'Changes in the relative demand for skills in the UK labour market', *Discussion Paper No 952*, Centre for Economic Policy Research, 1994.