

CHAPTER 6

MANUFACTURING EXPORT SHARES AND COST COMPETITIVENESS OF ADVANCED INDUSTRIAL COUNTRIES

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Introduction

In recent months there has been considerable public discussion on the efficacy of devaluation as a policy instrument, capable of rectifying the UK's chronic tendency to trade deficit by assisting UK industries in improving their shares of home and world markets. It is generally agreed that the Marshall-Lerner conditions hold in the long run—i.e. that an effective devaluation¹ will eventually leave the balance of trade in a better position than it would otherwise have been for a given level of output.

The main points at issue are: first, given the strongly adverse trends in UK trade, how large an effective devaluation would be required to achieve a satisfactory balance of trade at reasonably full employment; second, whether any once-for-all devaluation could be sufficient in the long run, or whether the devaluation must be progressive or repeated; and third, whether devaluation on the scale and frequency required is at all feasible in terms of its effects on inflation and the distribution of income.

As a contribution to discussion of the first two issues, this study examines manufacturing exports of the six largest trading nations over the last twenty years. It will be argued on the basis of this evidence that the UK has failed to secure enough effective devaluation, up to the present, to prevent a continuation of the long-run decline in the UK's manufacturing export share and that further continuing real devaluation will be necessary if the decline in export share is to be halted. Even on fast world trade growth assumptions and allowing for the contribution to the balance of payments of North Sea oil, it will be crucial to hold the UK share of manufactured exports at about its present level if there is to be a return to full employment in the 1980s.

The main steps in the analysis are:

- (a) for the UK and each of five major trading competitors; to examine changes in shares of manufactured exports and changes in cost competitiveness over the past twenty years;
- (b) using what we believe to be uncontroversial views about the elasticity of exports with respect to relative costs and prices, to examine how far changes in export shares were determined by changes in relative costs and how far there remained unexplained and persistent residual trend changes in these shares;

¹An effective devaluation is here defined as a decline in the exchange rate in excess of relative increases in unit labour costs.

- (c) then to consider on the same basis what scale of changes in cost competitiveness (relative to those which actually occurred) would have been necessary to offset the unexplained trend changes in each country's export share and thus hold each country's export share constant;
- (d) on optimistic and pessimistic assumptions about the growth in world trade in manufactured goods up to 1985, and assuming relative cost competitiveness fixed at average 1976 levels, to predict export shares (and therefore export volumes) for each country and confront them with past rates of growth in exports;
- (e) (for the UK only) to consider what would need to happen to net exports of manufactures and relative costs for reasonably full employment and a satisfactory balance of trade to be achieved in the 1980s.

Changes in export shares and relative costs

The UK share of the volume of world² manufacturing exports fell by over 50% in the two decades from 1956 to 1976 (see Table 6.1). This is part of a longer-term decline whereby the export share fell from about 33% in 1899 to 8.3% in 1976. Whatever the effects of more flexible exchange rates since 1967, they have not been sufficient to halt this decline in the UK share. In the two decades from 1956 to 1976 four countries, West Germany, France, Italy and Japan, increased their combined share of world trade by almost 20 percentage points from 27.2 to 46.8%—half of this increase accruing to Japan. Smaller industrial countries taken together lifted their share of world manufactured exports by almost 3 percentage points in the same period. On the other hand the share of the USA fell by over 40% (13 percentage points) and the UK share fell by over half (9 percentage points).

Indices of relative unit labour costs for the six main industrial exporting countries are shown in Table 6.2. For each country, indices of the level of unit labour costs in manufacturing industry in dollars were calculated using OECD indices of manufacturing earnings in dollars and dividing these by indices of trends in productivity. Indices of relative unit labour costs were then constructed by dividing each country's index of dollar unit costs by an index of the weighted average of the unit costs of the other five countries—the weights in each case being determined by the export shares of each country at the base date of 1970.

²In this article the coverage of data on world exports is restricted to developed market economies (with one or two exceptions equivalent to the group of OECD member countries).

Table 6.1 Percentage shares of the volume of manufactured exports from industrial countries (selected years, 1956-76)

	USA	UK	West Germany	France	Italy	Japan	Smaller* Industrial Countries
1956	30.0	17.8	14.4	6.0	2.6	4.2	25.0
1960	23.1	15.3	17.8	8.4	4.2	5.4	25.8
1965	20.2	12.2	17.6	7.7	6.0	8.7	27.5
1970	17.4	9.7	18.1	7.9	6.5	10.7	29.7
1975	18.7	8.6	17.1	8.4	6.6	12.5	28.0
1976	17.2	8.3	17.8	8.4	6.5	14.1	27.8

*Includes Canada, Belgium, Luxemburg, Netherlands, Switzerland, Sweden.

Source: *Monthly Bulletin of Statistics*, United Nations.

Table 6.2 Indices of relative unit labour costs for six large exporting countries (selected years, 1956-76)

	UK	USA	West Germany	France	Italy	Japan
1956	96.4	123.0	67.9	150.0	95.0	102.9
1960	105.5	128.4	78.6	118.7	88.8	89.7
1965	105.2	105.0	92.1	113.4	101.5	90.2
1970	97.0	97.9	98.6	101.4	98.8	107.9
1975	97.0	63.0	111.5	120.0	112.9	136.4
1976	90.4	68.1	111.1	118.4	103.3	140.2

Source: OECD *Main Economic Indicators*.

The most striking points to emerge from this calculation are the large and persistent rise in measured relative costs in Germany, and the enormous decline in measured relative costs in the USA since 1960. Movements in the other four countries fall between these two extremes. Relative costs in Japan were falling between 1956 and 1965, but increased sharply thereafter. Relative costs in the UK deteriorated gradually up to 1967 and subsequently showed only a moderate tendency to improve, in spite of a substantial nominal devaluation of sterling; most of the sterling depreciation merely compensated for the persistently lower growth of productivity and higher inflation in the UK than in other countries.

Now turning back to the export shares shown in Table 6.1, we find trends in startling contrast to those in relative costs. In West Germany there has been a large and persistent increase in relative costs, yet her share of the volume of exports, after rising at the beginning of the period, remained constant between 1960 and 1976. Thus a 40% rise in relative costs over 16 years was associated with West Germany's export share increasing at the expense of other industrial countries. In contrast the USA was unable to prevent her export share falling by over 40%, in spite of an almost 50% reduction in measured relative costs.

Explanation of changes in export shares in terms of cyclical effects, changes in relative cost competitiveness, and residual trends

To identify more precisely how much of the movement of export shares can be explained by changes in relative costs and to measure the magnitude of any persistent residual trend changes, a statistical model was postulated in which export shares are a function of the volume of world trade itself (to isolate cyclical

fluctuations), appropriately lagged indices of relative costs, linear trends, and random disturbance terms.

If each country maintained its share of world exports through the trade cycle, there would obviously be no need to adjust export shares for cyclical effects. But since it is likely in practice that the response of individual countries' exports to fluctuations in trade differs, it is necessary to make some allowance for this as a first step to isolating the underlying trends.

A large number of statistical experiments were carried out to ascertain the response of export shares in the six large industrial countries to cyclical variations in world trade. These experiments comprised specifications, some in which the elasticities with regard to relative costs were freely estimated, others in which they were imposed; a variety of time periods and lag structures were employed in each case. The values for cyclical elasticities finally selected were: UK -0.2, USA +0.1, France -0.2, Italy -0.45, West Germany 0, Japan +0.15, the 'Rest' +0.1.¹ These values are small enough, except for Italy, to mean that cyclical factors are a small component of changes in export shares.

In this study effective devaluation is measured in terms of relative unit labour costs in a common currency, because this takes account not only of changes in exchange rates but also of differences in the rates of increase in money earnings and productivity growth. When it comes to measuring elasticities most other work has been conducted in terms of changes in relative prices rather than costs. Relative export prices tend to move less than relative costs for two reasons. Firstly, some part of a fall in relative unit labour costs may be reflected in increased export profits rather

¹The weighted sum of these elasticities, using 1970 export shares as weights, is zero—see Appendix to this chapter.

Table 6.3 Long-run price elasticities of demand for exports estimated in previous studies

Country	Number of estimates	Range of estimates	'Best' point estimate
USA (manufactured exports)	10	-0.56 to -2.62	-1.24
Japan (manufactures)	12	-0.35 to -4.14	-1.77
France (total exports)	6	-1.06 to -2.27	-1.31
West Germany (total exports)	6	-0.65 to -1.88	-1.11
UK (manufactures)	3	-1.00 to -3.00	-2.00
Italy (total exports)	7	-0.03 to -1.96	-0.93

Source: *Price Elasticities in International Trade*, by R. M. Stern, J. Francis and B. Schumacher, for the Trade Policy Research Centre, Macmillan, 1976.

than in lower export prices.¹ But even if there were no increase in export profits, relative prices still move less than relative unit labour costs, because of the effect of changes in the cost of imports on export prices. Price elasticities are therefore likely to be higher than cost elasticities.

The first step in establishing a plausible range of values for relative cost elasticities was to examine the results of other studies of export price elasticities in the six large countries. It was fortunate that we could draw on a recent summary of earlier studies commissioned by the Trade Policy Research Centre, on which Table 6.3 is based.

Altogether evidence from 44 studies is available for the countries with which we are concerned. The range of elasticities shown for each country is wide, but the authors give 'best' estimates which average -1.4, varying from -0.93 for Italy to -2.00 for the UK. For the reasons given above, relative prices probably only change about half as much as relative costs. It is therefore to be expected that relative cost elasticities would be roughly half the magnitude of price elasticities, and, on the evidence of earlier studies, would vary between -0.5 and -1.00.

The next stage was to estimate relative cost elasticities from our own annual data for each of the six countries, whilst imposing preferred values for cyclical elasticities. Estimates of relative cost elasticities were made separately for six countries, over three distinct time periods (1956-76, 1956-73 and 1960-76) and using a short and long geometric lag formulation. With the exception of Germany the estimated elasticities were all of the right sign, clustering at the higher end of the expected range around -1.0, and statistically significant. The sensitivity to the time period selected was small, but the longer lag structure resulted in rather higher relative cost elasticities (see Table 6.4). The preferred estimate of relative cost elasticities for all countries is -1.0. But because of some variation between countries, and particularly in view of the statistically poor results for Germany, we carried out the further analyses discussed below using three alternative values for cost elasticities: -0.5, -1.0 and -1.5.

Cyclical and relative cost elasticities were also freely estimated simultaneously. On the whole the results

were more variable. Nevertheless the results were distinctly encouraging, in that there was conclusive evidence of significant and strong elasticity effects consistent with the results of other studies shown in Table 6.3. Of the 18 freely estimated relative cost coefficients shown in the Appendix Table 6A1, 13 were near to -1.0.

Table 6.5 shows the manufactured export shares of the six large trading nations, progressively adjusted for cyclical variations in world trade about trend and for variations in lagged relative cost changes relative to the base year 1970.

It is clear from the final columns of the table that there are considerable unexplained trends remaining in the export shares of several countries, after making adjustments for variations in world trade and for changes in relative cost competitiveness. These unexplained residual trends are summarised in Table 6.6 for the preferred relative cost elasticity of -1.0. The residual trend shares are not highly sensitive to the assumed value of the relative cost elasticity within the plausible range, -0.5 to -1.5.

Table 6.4 Estimated relative unit labour cost elasticities for six industrial countries - imposed trade elasticities

	Shorter lag 1956-76	Longer lag		
		1956-76	1956-73	1960-76
UK	-0.71 (4.5)	-1.10 (6.5)	-1.10 (5.0)	-1.37 (5.0)
USA	-0.80 (8.3)	-0.98 (9.0)	-0.86 (4.4)	-1.00 (6.8)
France	-0.64 (3.2)	-1.10 (3.1)	-1.70 (4.2)	-0.44 (1.0)
Italy	-0.58 (1.5)	-1.3 (1.6)	-2.3 (2.3)	-1.1 (1.3)
W. Germany	+0.23 (0.8)	-0.2 (0.4)	-0.44 (0.8)	-0.3 (1.4)
Japan	-0.73 (7.4)	-0.83 (7.1)	-0.98 (6.1)	-1.00 (5.5)

Notes: Figures in parentheses refer to *t* ratios. The shorter lag involves a decline in the weight of earlier years at the rate of 60% per year; the longer lag involves a 30% decline per year.

Most striking amongst these residual trends are the consistent upward movements of the adjusted export share of West Germany and Japan at the expense of the UK and the USA. These are extremely persistent

¹At times relative cost indices and relative export price indices diverge sharply. This implies substantial changes in profit margins. A case in point is that of Japan in 1975/6 when, although relative unit labour costs increased, relative export prices fell. However, these changes in profit margins are unlikely to persist for very long.

Table 6.5 Manufactured export shares of six large countries adjusted for variations in world trade and relative costs

		Actual share	Adjustment for variation in world trade	Share after adjusting for variation in world trade	Adjustment for relative costs			Export share after all adjustments		
					Elasticity			Elasticity		
					-0.5	-1.0	-1.5	-0.5	-1.0	-1.5
UK	1956	17.82	+0.40	18.22	0.59	1.38	2.34	17.63	16.84	15.88
	1960	15.32	+0.03	15.35	0.02	0.20	0.55	15.33	15.15	14.80
	1965	12.24	-0.10	12.14	-0.26	-0.48	-0.65	12.40	12.62	12.79
	1970	9.65	+0.08	9.73	-0.11	-0.22	-0.32	9.84	9.95	10.05
	1975	8.63	-0.09	8.54	0.05	0.15	0.30	8.49	8.39	8.24
	1976	8.27	-0.07	8.20	0.17	0.40	0.68	8.03	7.80	7.52
USA	1956	30.02	-0.32	29.70	-2.61	-4.99	-6.10	32.31	34.69	36.80
	1960	23.13	-0.03	23.10	-2.68	-5.35	-7.96	25.78	28.45	31.06
	1965	20.23	+0.09	20.32	-1.28	-2.55	-3.82	21.60	22.87	24.14
	1970	17.35	-0.06	17.29	-0.55	-1.11	-1.66	17.84	18.40	18.95
	1975	18.70	+0.10	18.80	2.37	4.52	6.46	16.43	14.28	12.34
	1976	17.17	+0.08	17.25	2.48	4.69	6.65	14.77	12.56	10.60
West Germany	1956	14.39	0	14.39	2.80	5.18	7.16	11.59	9.21	7.23
	1960	17.80	0	17.80	2.76	5.24	7.42	15.04	12.56	10.38
	1965	17.58	0	17.58	1.18	2.34	3.47	16.40	15.24	14.11
	1970	18.12	0	18.12	0.61	1.20	1.80	17.51	16.92	16.32
	1975	17.10	0	17.10	-0.81	-1.54	-2.19	17.91	18.64	19.29
	1976	17.77	0	17.77	-0.79	-1.47	-2.04	18.56	19.24	19.81
France	1956	6.03	+0.14	6.17	-1.11	-2.31	-3.60	7.28	8.48	9.77
	1960	8.39	+0.01	8.40	-0.76	-1.47	-2.12	9.16	9.87	10.52
	1965	7.75	-0.06	7.69	-0.50	-1.00	-1.50	8.19	8.69	9.19
	1970	7.95	+0.06	8.01	-0.36	-0.72	-1.10	8.37	8.73	9.11
	1975	8.44	-0.08	8.36	-0.38	-0.71	-1.01	8.74	9.07	9.37
	1976	8.42	-0.08	8.34	-0.40	-0.76	-1.07	8.74	9.10	9.41
Italy	1956	2.58	+0.13	2.71	0.13	0.28	0.46	2.58	2.43	2.25
	1960	4.18	+0.02	4.20	0.23	0.49	0.77	3.97	3.71	3.43
	1965	6.00	-0.11	5.89	0.07	0.17	0.29	5.82	5.72	5.60
	1970	6.55	+0.11	6.66	0.07	0.15	0.24	6.59	6.51	6.42
	1975	6.61	-0.15	6.46	-0.12	-0.19	-0.23	6.58	6.65	6.69
	1976	6.50	-0.13	6.37	-0.08	-0.11	-0.10	6.45	6.48	6.47
Japan	1956	4.19	-0.07	4.12	0.21	0.47	0.74	3.91	3.65	3.38
	1960	5.37	0	5.37	0.44	0.90	1.36	4.93	4.47	4.01
	1965	8.70	+0.05	8.75	0.78	1.52	2.21	7.97	7.23	6.54
	1970	10.71	-0.06	10.65	0.36	0.71	1.06	10.29	9.94	9.59
	1975	12.51	+0.10	12.61	-1.11	-2.22	-3.34	13.72	14.83	15.95
	1976	14.06	+0.09	14.15	-1.37	-2.73	-4.10	15.52	16.88	18.25

and sizeable residual trends in export shares after allowing for the effects of significant and sometimes large changes in relative costs. These figures imply that progressive effective devaluation of sterling on a large scale would have been necessary to preserve the UK share of world trade, if it is assumed, for the moment, that the trends themselves are not influenced by changes in relative costs.

In the case of Germany it is worth emphasising that, under the assumptions of the analysis, her share of world trade would have risen by 10 percentage points between 1956 and 1976 had she not been willing to let relative costs in dollar terms rise by 64%. This large rise in relative costs prevented Germany's actual share of world manufactured exports from growing

more rapidly. Japan's relative costs on the other hand did not rise fast enough to prevent her export share rising by a large amount and it is this aggressive Japanese stance more than anything else which has been the cause of the rapid deterioration in UK and US export shares.

Whatever the causal factors lying behind these strong residual trends, it is clear that the amount of effective devaluation required at any one point in time must take account of them and that repeated effective devaluation will be needed as long as they persist. This would only cease to be the case if the residual trends were eventually reversed by successive devaluations and/or by some other kind of intervention, such as industrial policy or protection.

Table 6.6 Changes in manufactured export shares for which there is no adequate explanation in terms of relative costs and world trade (Relative cost elasticity assumed equal to -1.0)

	UK	USA	W. Germany	France	Italy	Japan
1956-1960	-1.69 (-10.0)	-6.24 (-18.0)	+3.35 (+36.3)	+1.39 (+16.4)	+1.28 (+52.7)	+0.82 (+22.5)
1960-1965	-2.53 (-16.7)	-5.58 (-19.6)	+2.68 (+21.3)	-1.18 (-12.0)	+2.01 (+54.2)	+2.76 (+61.7)
1965-1970	-2.67 (-29.1)	-4.47 (-19.5)	+1.68 (+11.0)	+0.04 (+0.5)	+0.79 (+13.8)	+2.71 (+37.5)
1970-1975	-1.56 (-15.7)	-4.12 (-22.4)	+1.72 (+10.2)	+0.34 (+3.9)	+0.14 (+2.2)	+4.89 (+49.2)
1970-1976	-2.15 (-21.6)	-5.84 (-31.7)	+2.32 (+13.7)	+0.37 (+4.2)	-0.17 (-2.6)	+6.94 (+69.8)
Total 1956-76	-9.04 (-53.7)	-22.13 (-63.8)	+10.03 (+108.9)	+0.62 (+7.3)	+4.05 (+166.7)	+13.23 (+362.5)

Notes: Figures not in parentheses refer to changes in the share in terms of percentage points per period.
Figures in parentheses refer to percentage changes in the share during the period.

Table 6.7 Changes in relative costs necessary to maintain constant shares through selected periods (per cent)

	1960-65		1965-70		1970-76	
	Required	Actual	Required	Actual	Required	Actual
UK	-22.2	-2.6	-25.5	-5.5	-16.8	-2.9
USA	-23.5	-12.5	-14.8	-0.7	-26.5	-25.7
France	-9.1	-1.6	+0.2	-2.4	+18.0	+11.4
Italy	+57.9	+10.0	+4.0	-4.9	+3.1	+3.8
W. Germany	+9.5	+10.9	+3.2	+0.1	+8.4	+10.6
Japan	+64.0	+1.3	+37.6	+11.8	+59.9	+21.8

Note: Required and actual changes in relative costs are both measured as a ratio of end-period lagged relative costs to initial (unlagged) relative costs.

The scale of changes in cost competitiveness which would have been required to maintain constant manufacturing export shares

This section shows the amount of effective devaluation that would have been needed in each country to hold export shares constant through three selected time periods (including the amount necessary to offset cyclical movements). The required effective devaluations are compared with what actually took place.

Table 6.7 shows the required and actual changes in relative costs for each country and period. The results are most revealing. In all three periods the UK failed to secure anything like sufficient effective devaluation to maintain her export share. Even the large nominal devaluations which took place between 1970 and 1976 were far short of that required to reduce relative costs by enough to hold the 1970 export share. The USA, with a similarly declining export share, also failed to halt the decline in the 1960s, but managed a very large effective devaluation in the early 1970s. West Germany was remarkable in the sense that the actual increase in relative costs in each period was very close to that required to maintain her export share constant. Japan, by contrast, held relative costs well below the level required to maintain her export share constant, even though relative costs increased by as much as 21.8% in the latter period.

The general picture to emerge, therefore, is of a trading system dominated by strong long-run trends in export shares whose effects were reduced but not

reversed by effective devaluations and revaluations. This result goes some way to explaining the 'Kaldor paradox' that *ex post* the value of net exports appeared to respond perversely to effective devaluations.¹ The reason is that relative cost changes, although moving in the right direction, have not been large or frequent enough to reverse the strong underlying trends in export shares.

Prospects for growth in world trade and UK manufactured exports up to 1980 and beyond

In this section the prospects for export growth of each country up to 1980 and beyond are examined on the assumption that cost competitiveness remains at 1976 levels, given an optimistic and a pessimistic assumption about the growth of exports of OECD countries as a whole.

In setting a relatively optimistic and relatively pessimistic assumption for growth of trade, regard must be had to past relationships between trade and output, as well as to what is thought possible by OECD countries in the future (see Table 6.8).

Relative costs for each country would remain at their 1976 level if:

- (i) productivity growth in each were to be the same,
- (ii) the growth in earnings in each were to be the same,

¹N. Kaldor, 'Economic crisis: exports and the sinking pound', *The Times*, 9 November 1976.

Table 6.8 Growth in OECD countries 1963-1976

Percentage change in	1963/4-1973/4 Average	1975	1976	1977 forecast*
GNP	5.0	-1.2	5.0	3.75
Industrial production	5.7	-7.8	8.5	5.0
Manufactured exports	10.7	-4.5	9.5	6.5

*Forecast by OECD, December 1976.

Table 6.9 Expected growth in the volume of manufactured exports 1976-85 if world trade grows by 9% per annum and 11% per annum respectively and if all countries' relative costs are fixed at 1976 levels, and remain unchanged until 1985

	Growth rates in export volumes (% per year)			Export shares (% of total)		
	Actual 1963-1976	Projected 1976-85		Actual 1976	Projected 1976-85	
		A	B		A	B
UK	5.8	4.64	6.14	8.3	5.7	5.5
USA	7.5	3.60	5.64	17.2	10.3	11.0
France	10.1	7.51	9.05	8.4	7.4	7.2
Italy	10.1	11.61	12.71	6.5	8.0	7.5
W. Germany	9.2	10.42	12.41	17.8	19.9	19.9
Japan	13.5	14.56	16.93	14.1	22.0	22.5
The Rest	9.7	8.27	10.41	27.8	26.2	26.5
Total	9.3	9.00	11.00	100	100	100

(A) world manufactured exports assumed to grow at 9% per annum.

(B) world manufactured exports assumed to grow at 11% per annum.

(iii) there was no further movement in exchange rates,

(iv) adverse movements in any one or two of these were matched by compensating favourable movements in the other(s).

If the UK fails to keep unit costs in line with those in other countries, because of faster inflation or lower productivity growth than in other countries, further devaluation of sterling relative to other currencies will be needed for the UK to achieve even the export growth averaging 5 to 6% per annum projected in the table.

If the UK is to maintain its 1976 share of manufactured exports to 1980 and beyond, a further fall in UK relative costs of the order of 30% will be required to raise the growth of manufactured exports from the projected figure of 6% per annum to somewhere between 9% and 11% per annum. This compares with a 15% reduction in actual relative costs achieved between 1965 and 1976. In the absence of a significant improvement in the trend of UK inflation relative to other countries, this could only come about by further effective depreciation of the exchange rate.

It would be hoped that such a substantial acceleration in the growth of export volumes, if sustained over a number of years, would itself lead to increases in investment, innovation and productivity, which would reduce unit costs in such a way that repeated devaluations would not be required. At this point what we have termed the decline in the residual trend share would have been halted.

As far as West Germany and Japan are concerned, their high output growth rate has been and will continue to be dependent on rapid export growth to pay for rapidly growing imports. With unemployment at historically high levels in all countries, there will be

great reluctance on the part of countries like Japan and Germany to allow their currencies to appreciate and thereby limit their rate of growth of manufactured exports.

So far as the future growth of output is concerned, the medium term strategy adopted by the OECD Council at Ministerial level in June 1975 suggested that 'an annual growth rate (in GNP) for member countries collectively of 5% per annum or somewhat more during the five years 1976-1980 was feasible'. Events since then may have reduced the growth prospects in some member countries, but by no means in all. On this basis the optimistic growth assumption for industrial production might be in the region of 6% a year and the pessimistic assumption around the 4% mark, the latter implying that the OECD countries in general may not return to full employment by 1980.

Growth assumptions for industrial output can be transformed into assumptions for manufactured exports using the following relationship between OECD industrial production and world manufactured exports (1963-1976):

$$\ln X = -5.4 + 0.054t + 0.85 \ln Y$$

$$(10.8) \quad (9.9) \quad (7.2)$$

$$R^2 \quad 0.997$$

where X is the volume of world exports of manufactures

Y is the volume of industrial production in OECD countries

t = time

figures in parentheses are t ratios.

This suggests growth in manufactured exports of OECD countries of 11% a year on the optimistic GNP growth assumption, and 9% a year on the pessimistic assumption.

Table 6.9 shows the growth of exports of each country which would be expected if relative unit

labour costs were held constant for all countries at their 1976 level over the period to 1985, on both assumptions about the growth in world trade.

Implications for the UK manufacturing sector 1976-81 and beyond

The analysis so far has been concerned with manufactured exports. It suggests that, given quite rapid growth in world trade and with the 1976 level of cost competitiveness held, these may grow by an average of about 6% per annum between 1976 and 1985. The main reason for this low figure is the persistent adverse trend in UK exports which remains after making allowance for changes in relative costs. We believe that these trends will not be easily reversed.

It remains to consider the prospects for the UK manufacturing sector as a whole. For this we use a projection of the main CEPG model, conditional on cost competitiveness being held constant with the basic balance of payments moving into a modest surplus of about £1,000m per annum (at 1975 prices) after including the full expected benefits of North Sea oil. This may not be what actually happens, but it is a sensible set of conditions on which to assess the prospects for UK manufacturing industry.

Table 6.10 sets out the main trends in UK manufacturing industry over the past 15 years and confronts these with the conditional projections for the next decade. The growth in the volume of manufactured exports has been accelerating, although as we have seen, it lags lamentably below those of many trading partners. The acceleration is no doubt due in part to such relative cost reductions as have been achieved in recent years. The acceleration of export growth is expected to continue in the next two years as the effects of recent sterling depreciation work themselves through, giving a growth rate approaching 7% per annum between 1976 and 1981. But with cost competitiveness held constant at its 1976 level, the growth of exports after 1981 slows down in response to the adverse residual trends. In the early 1980s the projected growth rate is down to 5.3% per annum.

The rapidly increasing contribution of North Sea oil to the balance-of-payments position will necessitate increased growth of domestic demand, if a large balance-of-payments surplus is to be avoided. One of the important unknowns is how quickly the UK manufacturing sector could respond to a rapid increase in both export and domestic demand. Table 6.10 assumes that the response would be large and could take place before existing spare production capacity was exhausted. Hence an increase in manufacturing production of 5.8% per annum (1976-81) is shown. Given that cost competitiveness is held at its 1976 level, such unprecedented growth rates in output are associated with projected growth rates for import volumes of 14.3% over the same period. Although the model indicates that the demand conditions necessary for such a radical transformation in UK growth rates will exist, it is in our view likely that supply constraints will prevent such rapid growth from taking place.

The main reasons for this can be seen from the experience of the UK manufacturing sector between 1970 and 1976, as shown in Table 6.10. The annual growth rate in manufacturing production averaged only 0.63% per annum throughout this period. But this does not mean that there are huge amounts of spare capacity. Manufactured imports, growing at over 9% per annum, were taking a rapidly increasing share of the UK market for manufactured goods. The rate of industrial closures was high and the rate at which new factories opened declined sharply relative to the 1960s. Throughout the period manufacturing investment in real terms failed to exceed its 1970 level.

Six years of such an experience is not the ideal situation from which to organise a quick response to a rapid increase in demand of an unprecedented magnitude. Manufacturing investment is expected to rise in 1977 by perhaps 15-18% in real terms, but increases approaching this magnitude were necessary in 1959/60 and 1964/5 merely to sustain the growth rate of 3% per annum through the cycle. Continuing growth of this magnitude is unlikely to be sustained by the capi-

Table 6.10 The UK manufacturing sector

	Annual average growth rates per period in manufacturing (% per annum)					Annual average level of net exports	Average import share* per period		
	Production	Employment		Productivity				Import volumes	Export volumes
Actual									
1960-65	3.23	0.33		2.88		6.2	3.84	+2108	8.0
1965-70	2.71	-0.52		3.26		9.4	5.83	+2004	10.4
1970-76	0.63	-2.21		2.92		9.1	6.04	+1641	16.3
Projected		A	B	A	B				
1976-81	5.8	+2.7	+1.7	3.0	4.0	14.2	6.82	+583	21.2
1981-85	2.7	-0.3	-1.2	3.0	4.0	9.7	5.29	-3646	28.4

*The import share is defined here as $\frac{M}{DP-X+M}$ where DP is

the value of gross output of the manufacturing sector at 1970 prices. The indicator may be biased by changes in the ratio of finished to semi-finished manufactured imports relative to the 1970 base.

(A) assumes productivity growth of 3% per annum.

(B) assumes productivity growth of 4% per annum.

tal goods industries. Moreover it should not be forgotten that in many capital-intensive manufacturing industries it takes 2-3 years for new industrial plant to be installed and the average time for entirely new plants to reach full production capacity is about seven years. Given these kinds of supply constraint, and notwithstanding the possible achievements of the national industrial strategy, it is difficult to see how an output growth rate approaching 6% per annum could be sustained over the next five years, and how such a growth rate could be associated with only a 14% growth rate in the volume of manufactured imports.

But assuming the projections in Table 6.10 were

APPENDIX

The form of equation used to analyse and project export shares is

$$\ln \left(\frac{X_i}{W} \right) = a_{0i} + a_{1i}t + a_{2i} \ln \left(\frac{W}{W^*} \right) + a_{3i}(RCL_i - \ln RC_{i, 1970}) \quad (1)$$

where X_i is exports of manufactures of the i th country, in 1970 dollar terms

W is total OECD exports of manufactures, i.e. $\sum X_i = W$

W^* is the trend value of W , obtained from fitting a log trend to the period 1956-76.

$RCL_{i,t} = \lambda \ln RC_{i,t} + (1-\lambda)RCL_{i,t-1}$

where λ is the geometric lag parameter on relative unit labour costs, RC
 t is a time trend

The relative unit labour cost indices are constructed from the formula

$$\ln RC_i = \ln ULC_i - \sum_{j \neq i} \beta_{ji} \ln ULC_j \quad (2)$$

where ULC_j is the j th country's unit labour costs, expressed in a common currency and β_{ji} is the share of j 's exports in total OECD exports (excluding 'the rest' and country i) in 1970. (Since no information is readily available for the rest's unit labour costs, this composite country is assumed to have constant relative costs throughout.)

The elasticity of the i th country's export share with respect to the world cycle is thus a_{2i} ; note that this is equivalent to an elasticity of $(1+a_{2i})$ for the level of exports. The elasticity of the share with respect to relative costs is a_{3i} . The regressions referred to in the text involved either freely estimating all four coefficients in the above equation or imposing an a priori value of one or other of a_{2i} and a_{3i} and estimating the three remaining coefficients. For the chosen values of a_{2i} and a_{3i} , the residual shares for the past shown in tables 6.5 and 6.6 are obtained as

$$\exp \left[\ln \left(\frac{X_i}{W} \right) - a_{2i} \ln \left(\frac{W}{W^*} \right) - a_{3i} (RCL_i - \ln RC_{i, 1970}) \right]$$

The projected trend shares for the future can then be obtained by estimating the coefficients a_{0i} and a_{1i} , conditional on the assumed values for a_{2i} and a_{3i} , and using these estimates to project the trend. Projected

feasible from the supply side point of view, the long-term prospects for the UK manufacturing sector remain unfavourable. When the growth in North Sea oil revenues begins to slow down in the early 1980s, an increasing contribution to the balance of trade will be required from manufacturing, if growth is to be sustained. But by this time net exports of manufactured goods are expected, under the conditions of the projection, to be in a sizeable deficit in excess of £3,000m per annum and deteriorating rapidly. A reversal of this trend would require further effective devaluation or other measures, such as protection, to allow growth to take place and thereby avoid a reduction in living standards as oil revenues decline.

actual shares can then be obtained by adjusting for the assumed future levels of total OECD exports in relation to trend and of relative costs.

The export shares must, for consistency, sum to unity in any particular year, both for actual shares and after adjustment for cyclical factors and/or relative costs. Formally this imposes constraints on the admissible values of the sets of coefficients a_{1i} , a_{2i} and a_{3i} , but with a logarithmic equation of the form shown above these constraints can in general only be exactly enforced for one year. Thus it may be shown that in any given year, the condition that ensures that the sum of cyclical adjustments to shares is zero is

$$\sum_i a_{2i} \frac{X_{it}}{W_t} = 0 \quad (3)$$

and unless the shares never change, or the a_{2i} are all zero, then this condition cannot be satisfied for every year. The preferred elasticities given in the text do obey this condition for the base year, 1970.

The corresponding condition for the relative costs term is more complex, as it must take account of the construction of the relative cost indices: an increase in i 's unit labour costs will increase i 's relative costs but will reduce j 's relative costs to an extent which depends on i 's share in the trade of j 's competitors. The requirement here is that any change in unit labour costs in a given year should generate changes in relative costs with consequent changes in shares, the sum of which is zero. This condition is in fact a set of multiple conditions, namely

$$\sum_i a_{3i} \beta_{ji} \frac{X_{it}}{W_t} = 0 \quad \text{for each country } j \quad (4)$$

where β_{ji} is defined in (2) ($\beta_{ii} = -1$)

The extent to which these conditions are not fulfilled thus depends on the extent to which shares are unequal and to which they change as compared with the base year, even if it is assumed (as in the text) that a_{3i} is the same for each country (excluding the rest).

Where any such discrepancies arise due to the non-fulfilment of these conditions, then the relevant adjusted shares have to be scaled in order that they should sum to unity (generally these further adjustments are fairly small). A similar procedure is followed when the residual shares are projected by a trend into the future.

Table 6A1 World trade and relative unit labour cost elasticities with all parameters freely estimated

	1956-76		1956-73		1960-76	
	World trade	Relative cost	World trade	Relative cost	World trade	Relative cost
UK	-0.28 (2.7)	-1.14 (6.0)	-0.18 (1.1)	-1.02 (2.8)	-0.22 (1.7)	-1.47 (5.0)
USA	+0.07 (0.5)	-0.99 (8.9)	+0.06 (0.3)	-0.9 (3.4)	-0.01 (0.1)	-0.95 (5.8)
France	-0.29 (1.4)	-1.0 (3.0)	+1.25 (4.1)	-4.1 (7.9)	-0.21 (1.1)	-0.44 (1.0)
Italy	-0.56 (2.0)	-1.59 (1.6)	-0.27 (0.9)	-2.6 (2.2)	-0.57 (1.7)	-1.25 (1.3)
W. Germany	+0.01 (0.1)	-0.21 (0.4)	-0.9 (6.5)	-0.84 (2.5)	+0.18 (1.7)	-0.12 (0.6)
Japan	-0.09 (0.5)	-0.76 (6.0)	+0.34 (1.0)	-1.1 (4.0)	-0.5 (2.3)	-1.1 (7.0)