Commonwealth Economic Papers: No.13

The World Economic Crisis:

a Commonwealth perspective

Selected background papers prepared
for a Commonwealth Group of Experts

Commonwealth Secretariat

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"The World Economic Crisis: A Commonwealth Perspective"

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PREFACE

The papers included within this volume were prepared to assist the Group of Experts which Commonwealth Heads of Government, meeting in August 1979, had requested the Secretary-General to assemble in order "to investigate and report on the factors inhibiting structural change and a sustained improvement in economic growth" and to "identify specific measures by which developed and developing countries, Commonwealth and non-Commonwealth, might act to reduce or eliminate such constraints as a matter of urgency". The Group consisted of ten experts who served in their personal capacities and were drawn from a representative range of developed and developing countries. During the first half of 1980 they met three times, and in July 1980 their Report was published by the Commonwealth Secretariat under the title "The World Economic Crisis : A Commonwealth Perspective".

Most of the papers were drafted within the two months between the first and second meetings of the Group. Two were written by consultants to the Secretariat and the remainder by staff of its Economic Affairs Division. The short time available for the work ruled out new and major research efforts, and the papers represent an effort to assemble, digest and present background information on some of the principal issues pertinent to the Group's terms of reference. Conclusions expressed in the papers are, of course, those of the authors and do not necessarily reflect the views of members of the Group or of Commonwealth Governments.

Seven groups of issues are covered by the papers, viz. the past record of and future prospects for economic growth, the special problems of the least developed countries, the balance of payments problems of developing countries, the trend toward protectionism in OECD and the need for positive adjustment policies, the energy issue, the current state of commodities, food and agriculture, and the relationship between disarmament and development.

Despite the short time in which the papers were drafted, it was felt that their content would be of interest to a wider audience than the Group of Experts for whom they were written. It should, however, be emphasised that no attempt has been made to update or otherwise revise the papers in the light of hindsight. They are essentially as submitted to the Group.

Bimal Jalan
Director, Economic Affairs

ECONOMIC GROWTH:
THE RECORD AND THE PROSPECTS

Economic Affairs Division
Commonwealth Secretariat

January 1980

Economic Growth: The Record and the Prospects

CONTENTS

I. Introduction

1. A number of studies are available on the economic performance of both developed and developing countries during the post-war period. The OECD and national agencies (such as the NIESR in Britain) also provide periodic quantitative projections of growth prospects in certain countries. For the longer-term, in addition to the work of Leontief on the "Future of the World Economy" and a number of independent studies (e.g. the work of the Meadows team on "The Limits to Growth"), the OECD recently carried out an elaborate study of the likely growth scenarios in OECD countries on alternative assumptions (commonly referred to as the "Interfutures" Report). For the developing countries, several UN agencies, particularly the World Bank, make periodic projections of likely growth rates in GNP and in particular sectors until 1990 or 2000. The projections for developing countries are often based on some simple relationships that are assumed to exist between their growth rates and those in advanced countries, and the availability of foreign capital for investment.

2. The purpose of this note is modest. It does not attempt to survey or critically examine the vast literature that exists on the subject. It is merely an attempt to recapitulate the highlights of the post-war economic performance in the developed and developing economies, and to provide a short summary of the main alternative growth scenarios for the future. An Annex on the impact of oil on the balance of payments of developing countries provides information on the share of oil in total imports, the financing of current account deficits, the debt servicing implications, the adjustment experience of the 1970s, and projections of the aggregate oil import bill and current account deficit.

II. The Past Record

3. The twenty-five years from 1948 to 1973 was a period of unprecedented economic growth. World production grew at an average annual rate of 5 per cent, an all-time record, and resulted in an average annual growth in per capita incomes of approximately 3 - 3.2 per cent in the OECD countries and 3.1 per cent in the developing countries. During the same period the value-added in world industry increased from $ 234 billion to $ 1,023 billion at 1970 prices, i.e. at an annual rate of more than 6 per cent (1), while agricultural production almost doubled in the developed market-economy countries and grew by 130 per cent in the developing countries. Table 1 shows the post-war record of growth in world trade and industrial production in relation to previous periods.

4. The high rates of growth until 1973 were accompanied by an absence of major depressions in the advanced economies. As Rostow has noted, "cycles became primarily systematic fluctuations in the rate of growth, rarely broken by the absolute declines in the output which marked-off the classical cycles of the past"(2). Although experience with trade cycles varied considerably

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1. Unless otherwise stated, all values are in 1970 United States dollars.

2. W.W. Rostow, The World Economy: History and Prospect, page 338.

among different economies, by and large their duration was shorter than in previous periods and fluctuations in income and employment were notably less. There was no cyclical period when GNP actually declined; the only difference between the upswing and the downswing phases was the rate at which GNP was expanding. The period until 1973 was also marked by the relatively low level of unemployment in most industrialised economies, and the comparatively low sensitivity of employment levels to changes in output.

5. For the Western economies and Japan, the period until the early 1970s was characterised by relative price stability (see Table 2). Up to 1971, the annual rates of increase in consumer price indices in most of the economies were less than 6 per cent. They accelerated, however, during 1972-74.

6. The performance of the developing countries as a group was also impressive. The average annual growth rate in the 1950s had been about 2 per cent and in the 1960s it accelerated to 3.4 per cent. On average, per capita income increased by almost 3 per cent annually during 1950-1975. Although comparable historical data are not available, partial evidence suggests that these rates were higher than previously. They also compared favourably with the experience of industrialised countries during the early phase of their industrialisation. In most of the presently industrialised countries, income per capita had grown by less than 2 per cent annually for the hundred years beginning in the mid-19th century. Even in Japan, the longer-run rate of growth in income per capita had been less than 2.5 per cent per year.(1).

7. With the increase in output, there were significant changes in the economic structure of the developing countries. Industry was the fastest growing sector, and during 1960-75 its contribution to total output increased from 17 per cent to 23 per cent in low-income countries and from 32 per cent to 38 per cent in middle-income countries. The structure of production is shown in Table 3 and the sectoral growth in Table 4.

8. Aggregate figures on the growth of developing countries as a group, of course, disguise wide differences in the performance of particular regions or countries. The most striking difference is that between the low-income and the middle-income countries(2). Growth rates were significantly lower than elsewhere in the low-income countries of Africa and Asia where the majority of the world's poor live. In countries accounting for half the population of the developing world, the income per person increased by less than 2 per cent per year. The growth rate in the low-income countries was only 3.1 per cent compared with 6 per cent in the middle-income countries. Growth of agricultural production for low-income countries was 2.1 per cent and that of industrial production 5.4 per cent, as compared with 3.5 per cent and 7.9 per cent respectively for the middle-income countries (all figures are average annual rates for the period 1960-75).

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1. World Development Report 1978, IBRD. The subsequent paragraphs draw heavily on this Report, particularly Chapter II.

2. Low-income countries are defined as those with per capita incomes of US $ 300 and below; middle-income countries are those with per capita incomes above US$ 300 among the developing countries (all data on the basis of 1977 GNP per capita).

9. The poor performance of the low-income countries reflects the lower rates of growth in the large poor countries of Asia (viz. India, Pakistan, Indonesia, and Bangladesh). The large Latin American countries, with the exception of Brazil, have also grown relatively slowly. The same is true of many African countries south of the Sahara. Among the fastest growing developing countries have been four countries in East and South-east Asia (viz. South Korea, Hong Kong, Taiwan and Singapore), countries in the Middle East and North Africa, and those of Southern Europe.

10. Although precise figures are not available, the record on redistribution, institutional reform, the reduction in poverty levels was (with a few exceptions) far from satisfactory. According to World Bank estimates, about 40 per cent of the population of developing countries is still living in 'absolute poverty'. The majority of them are in rural areas in the countries of South Asia, Indonesia, and Sub-Saharan Africa. In addition to the 'absolute poverty', many more people have inadequate access to essential public services, such as health-care, safe drinking water, and sanitation. These people include substantial proportions of the populations of middle-income countries. In the poorest countries, the incomes and consumption levels of the poorer half of the population have stagnated, and in countries where agriculture has expanded more slowly than population (parts of South Asia and Sub-Saharan Africa) the incomes of some of the rural population probably declined.

11. Unemployment and underemployment have continued to be acute in much of the developing world. Rapid urbanization has created a variety of strains and social costs which have been evident in the growth of slums and shanty towns, in the pressing demand for schools and hospitals, and in the overloading of transportation facilities. Some progress has been made in respect of education and health, but the deficiencies are many and the gaps in the availability of basic facilities are still very wide, both among and within countries.

12. On the whole, however, there is little doubt that by historical standards, the post-war period (until the early 1970s) was one of significant economic advance for both the industrialised and the developing countries. Although the period is too recent to permit an authoritative analysis of the factors responsible for the sustained growth performance of the 1950s and the 1960s, among the factors that have been noted in the literature as having contributed to the expansion of the world economy are: the primacy attached to economic growth as an objective of government policy; expansion in investment in European economies due to United States' assistance under the Marshall Plan; the growth in trade facilitated by a stable international monetary environment and reduction in tariff barriers; relatively cheap energy, cheap raw materials and cheap food; labour migration into economies facing labour shortages; and substantial acceleration in the flow of capital, both governmental and private, from the developed to the developing countries.(1)

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1. See, for example, Rostow, op. cit.: OECD Interfutures: Facing the Future; H.W. Arndt, The Rise and Fall of Economic Growth; C.P. Kindleberger, Europe's Postwar Growth; World Bank, World Development Reports; and W. Kasper, "Some Broad Perspectives of World Economic Growth", in W. Kasper and T.G. Parry, Growth, Trade and Structural Change in an Open Australian Economy.

III. Recent Developments

13. The sustained growth in the industrialised countries came to a halt in 1974-75 when there were actual declines in GDP. Although there was some recovery late in 1975 and in 1976, rates of growth in the industrialised countries continued to be substantially lower than in the corresponding periods of the 1960s. For the 1970s as a whole, the growth in output of the industrialised countries averaged about 3.4 per cent, as against almost 4.8 per cent during the previous decade. The events which led to this lowering of growth are well known, and some of them go back to the 1960s. The breakdown of the Bretton Woods monetary system in 1971 was a direct result of the loss of confidence in the dollar against the background of continuing massive US external payments deficits. A high rate of monetary expansion in 1972-73 (facilitated by the absence of the usual balance of payments constraints) fed a commodity boom on which was superimposed a series of agricultural harvest failures. The 1972-73 boom was exacerbated by the supply bottlenecks which appeared in response to rapidly rising inflation in many parts of the world. Prices of food, raw materials and industrial products all increased disproportionately compared with earlier upswings. The world was already beginning to adopt restrictive policies in 1973 when the oil crisis came.

14. As a result of these developments the combined current account position of the OECD area, which had been in surplus in the 1960s and early 1970s, swung into a $ 33 billion deficit in 1974. The deficit nearly vanished in the first half of 1975, as the severe recession brought a fall in imports while exports to OPEC countries rose sharply, but it subsequently widened as OECD economic activity picked up and demand from the developing countries slackened.

15. Inflation rose sharply in 1972-73 in response to the very rapid increase in demand and to the rise in food, energy and other commodity prices. Fifteen years of relative price stability came to an end; Europe moved from inflation rates of under 5 per cent per year to over 10 per cent. The average rate of inflation in OECD countries more than doubled between the 1960s and 1970s. Unemployment rates also increased throughout the OECD area to levels unprecedented since the second world war. The OECD Secretariat has computed a crude "discomfort index" (the sum of the rates of inflation and of unemployment). This index (see Table 5) rose from around five and a half percentage points in the 1960s to 17 percentage points in 1974-75. As Rostow puts it, there was a "convergence of stagnation and inflation unique in modern economic history".

16. As noted by the World Bank , "with the collapse of a sustained and simultaneous boom in the industrialised countries, the peaking of major commodity prices and the sharp increase in imported oil, 1974 marked a turning point in the economic performance and prospects of developing countries".(1) The immediate effect of recession in the industrialised countries, on top of the balance of payments constraints due to the energy crisis, was reflected in the lower growth rates of imports in the developing countries. The average annual rate of growth of imports during 1974-77 declined to 3.8 per cent, which was almost half that of the previous ten years. Similarly, the growth of exports also declined, to a little over 4 per cent, and that of GDP to less than 5 per cent. The period subsequent to the first

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1. World Development Report, 1979.

oil crisis saw a significant reduction in growth rates of middle-income countries, particularly those which had relied on trade as the primary engine of growth. Middle-income countries in all regions (except the Middle East and North Africa) showed a reduction in growth rates by about 2 percentage points compared with those registered in the previous ten years. A surprising development, however, was the acceleration of growth in the low-income Asian countries, particularly India. Despite severe balance of payments problems, the average annual rate of growth of GDP in these countries was over 5 per cent. Much of the improvement was attributable to an expansion in agricultural output to above 3 per cent, which was substantially higher than the average for the previous ten years. Part of this improvement was due to better weather but there is some evidence that substantial investments made in the agricultural sector were beginning to yield results by the mid-1970s. The slow expansion in international trade and import capacity, however, affected the growth of industrial output in almost all developing countries, including the low-income countries of South Asia. By the end of the decade, it was becoming clear that the prospects for industrial growth in these economies were likely to be severely affected by increasing balance of payments problems.

IV. Short-term Forecasts

17. The economic outlook for 1980 suggests that little progress has been made so far in solving the problems of the 1970s; indeed, countries are finding it increasingly difficult to deal with some of them. (1) As a result of the steep oil price increase in 1979 and anti-inflation policies of certain governments, growth in the OECD area is expected to decline from over 3 per cent in 1979 to 0.3 per cent in 1980.(2) The out-turn could be much worse, particularly if the industrialised countries are not better prepared than they were in 1979 to deal with short-term energy supply problems which might arise and/or if the poorer oil-importing countries are forced to curtail further their imports from the OECD countries in order to cope with higher oil prices. Although no estimates are available for developing countries, their growth will almost certainly be damaged further by the increases in oil prices and the recession in the industrialised countries.

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1. For instance, the OECD Secretariat estimates that an increase of 10 per cent in oil prices in 1980 would affect the OECD's real output almost twice as much as an equivalent rise in 1979. This is mainly because (a) the net import bill of OECD area is now larger, both in absolute terms and in relation to GNP; and (b) only about 15 per cent of any further increase in OPEC oil revenue, compared with about half of any such increase in early 1975, is likely to be spent within 12 months, as OPEC import volumes had already grown at a very rapid rate.

2. On the assumption that OPEC oil prices would remain unchanged in real terms after the increases announced up to November 1979, the OECD forecasts were for an overall 1 per cent growth rate in 1980; these were revised downward to virtual stagnation after the increases announced towards the end of 1979.

18. Since the Caracas meeting of OPEC in December 1979, estimates of the combined current account deficit of the OECD countries have been revised upwards to more than $75 billion, compared with $30 billion in 1979. Oil price rises, coupled with the effects of recession in the industrialised economies, will continue to aggravate the balance of payments problems of the net oil-importing developing countries. Towards the end of 1980, their combined current account deficit could be running at an annual average rate of $60-70 billion, equivalent to almost a third of their expected export earnings, compared with a quarter on average during 1975-78(1). The average rate of inflation in the OECD countries is not expected to fall below the present level of 10 per cent, while unemployment is likely to rise from about 17 million to more than 20 million.

19. The short-term problems could also complicate further the longer-term prospects. The OECD Secretariat has pointed out the danger of a 'low-growth trap', in which future recovery would be increasingly hampered by the lack of past investment at a time of monetary stringency and higher interest rates. It stresses that positive help on the supply side involves encouraging structural change and concentrating state aid on industries with fair medium-term prospects. Effective energy policies remain, however, a key element in this structural/investment approach; lower demand for energy during the recession will not minimise the urgency with which these policies need to be pursued.

V. Longer-term Prospects

20. Apart from the more than usual uncertainty surrounding the world economy at present, longer-term prospects can only be assessed on the basis of a number of assumptions, all of which are liable to important changes. A number of alternative 'scenarios' is available which throw some light on possible trends, though these are not meant to be forecasts in the sense of probable results. The outcome is dependent on assumptions regarding factors such as technological change, the price of conventional energy, the development of alternative energy sources, and the policies pursued by industrialised and developing countries. However, it is worth noting that most scenarios are pessimistic, and indicate that unless there is a substantial change in technological possibilities and/or government policies, the rest of this century will be characterised by low growth rates, high inflation and high poverty levels.

(a) GDP growth and production patterns

21. For example, the global average economic growth of 5 per cent per annum, achieved during 1948-1973, is postulated up to the year 2000 by the Interfutures Report in a 'high growth' scenario ('Scenario A' in Table 6) (2) which is critically dependent on the developed societies maintaining a consensus in favour of high growth and bringing about important changes in energy consumption levels, further trade liberalisation and considerable improvements in resource transfers to the developing countries. All other scenarios investigated in the Interfutures Report indicate lower growth rates, compared with the previous quarter century. Even the 'high-growth' scenario for the world economy suggests a somewhat lower growth (4.3 per cent per annum), than in the 1950s and 1960s for the OECD countries, compensated by an acceleration in the developing economies.

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1. Further notes on the impact of the oil price rises on the balance of payments of developing countries are given in the Annex to this Paper.
2. This scenario assumes that productivity losses incurred during the recession will be recovered and the long-term productivity in the USA will grow at an annual rate of 1.84 per cent per annum, with productivity in other OECD countries converging towards the US trend. See Interfutures, op.cit.

22. It is perhaps important to note that the developed countries could still hope to sustain reasonably high (1) rates of growth up to the year 2000, provided that a consensus in favour of 'high growth' was maintained and the necessary policy changes and structural adjustments were effected. Two important policy assumptions of the 'high-growth' scenario in the Interfutures Report are: (a) that energy policies would make it possible to reduce the income elasticity of demand for energy from 0.8 to 0.6 in OECD countries (2), and (b) that further trade liberalisation would take place with regular and more rapid reductions (5 per cent annually) in the trade bias for manufactures.

23. But if conflicts between social groups in the OECD countries and resistance to policy changes were to hold up structural adjustments, the economic prospects of these countries would worsen considerably, and their average growth, under this 'moderate growth' scenario ('Scenario B2' in Table 6) would drop to 3.5 per cent. (3) In fact, it seems that the failure of the industrialised countries to make structural adjustments, apart from adversely affecting the developing countries, would damage their own economic growth more severely.

24. In either of the scenarios considered, the prospects for the developed countries remain far from satisfactory. While slower growth in the OECD countries means that the share of the developing countries in world income would improve (to 32 per cent in the year 2000), more than 600 million of their people would still live in absolute poverty even if the 'high growth/ structural changes' scenario of the Interfutures Report could be realised for the OECD countries. In spite of significant increases in food production, which are far from assured, malnutrition would remain widespread, particularly in South Asia and Sub-Saharan Africa; it would be much worse if the growth in the OECD countries were to be lower and their aid flows to the developing countries remained at about present levels.

25. The share of developing countries (excluding China) in world industrial production would be around 16.5 per cent under both the 'high' and 'moderate' growth rate scenarios for the world economy (Table 7). Structural rigidities in the OECD countries, if not overcome, would reduce the annual growth in their industrial production from 4.0 per cent (which is itself lower than the rate achieved in 1960s) of the 'high growth' scenario to 3.4 per cent in the 'moderate growth' one (Table 7). The growth in developing countries' industrial production would also be adversely affected in this latter scenario, even though their share in a smaller aggregate would be higher.

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1. While lower than the average growth rate of 1948-73, a 4.3 per cent growth rate, if achieved, will be significantly higher than the average of 3.4 per cent registered during 1973-78.
2. The income elasticity of demand for energy in the developing countries will also need to be reduced, from 1.6 to 1.0.
3. The World Bank's assumptions for alternative scenarios for developing countries include GDP growth in industrialised countries of 3.5 per cent (low), 4.2 per cent (base) and 4.9 per cent (high).

(b) International trade

26. Under the 'high growth' scenario, world trade is expected to continue to grow at around 7 per cent per annum, about the same as during 1948-1971, reflecting relatively high rates of growth in GDP and further trade liberalisation. Growth in exports of capital goods from the OECD countries and of manufactures from the developing countries (9.5 per cent per annum) would compensate for a slowing down in trade in oil and food products. But a slower growth in the world economy, resulting from a failure to deal with structural rigidities, could reduce the growth in world trade to 6.5 per cent per annum, with a steep reduction in intra-OECD trade and a smaller one in the growth of exports of developing countries.

27. The relative share of developing countries (excluding China) in world exports of manufactures would increase under the 'high growth' scenario ('Scenario A') to 18.2 per cent from 10.3 per cent in 1970 (Table 8). It would be even high under other scenarios but that would be of smaller world totals, reflecting much slower growth in exports of manufactures from the OECD countries.

(c) The effect of a breakdown in North/South relations

28. The adverse effects of a slower growth in world production and trade, resulting from structural rigidities, could be further aggravated by a worsening of economic relationships between major groups of countries. If this were to happen, both the developed and developing countries would suffer a further loss in the growth of their incomes, even though the developing countries' relative share in the more slowly growing aggregates could be expected to be larger.

29. One of the Interfutures scenarios ('Scenario C') examines the effect of a hypothetical breakdown in relations between the North and South which might result from an increasing disillusionment of the developing countries with progress towards the establishment of a new international economic order. Such a breakdown would lead to collective self-reliance among developing countries, an intensification of intra-OECD co-operation centred around the USA, and the reduction of their ODA to 0.1 per cent of GDP, concentrated in Sub-Saharan Africa and South Asia. (OPEC countries could only partially compensate for this reduction in aid by tripling their own aid.)

30. Both the developed and developing countries would be adversely affected by such a breakdown. World production would increase by a factor of only 2.4, compared with 2.9 in the 'moderate growth' scenario, and the average per capita income would increase to US $1,530 at the end of the century, compared with US $1,920 in the 'moderate growth' scenario (Table 6). Although the developing countries' share in world income would be 33 per cent, their per capita income would be only US $656 against US $790 in the 'moderate growth' scenario.(1) It is interesting to note that the adverse effect of a breakdown in North/South relations on the growth of income of developed countries would be relatively greater than on that of developing countries.

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1. The comparable figures under the 'high growth' scenario are: world per capita income US$2,210; developing countries' per capita income US$860.

(d) Effect of increased protectionism

31. Another Interfutures scenario ('Scenario D') explores the effect of increased protectionism between the three major poles (USA, EEC and Japan) of the OECD, which might be a response by the advanced societies to pressures for structural adjustment in a situation of slower growth and social conflicts. At the same time, it is assumed that the trade rivalry between the OECD partners would lead the three poles to develop preferential links with specific regions in the Third World, which become their partners. The combined effect would be a further reduction in the growth of income, compared with the 'moderate growth' scenario, for both the developed and developing countries, though the relative share of the latter in world income would be larger. The adverse effect is, however, only slight, though increased protectionism would presumably have a much more severe effect if it were not accompanied by preferential arrangements with developing countries. Moreover, the effect of increased protectionism is considered here in relation to the 'moderate growth' scenario, which is itself more adversely affected by the absence of structural adjustments and trade liberalisation required under the 'high growth' scenario. The differences in incomes between the 'high growth' scenario and the 'protectionist' scenario are indeed very considerable for both the developed and developing countries.

Table 1

Growth in World Trade and Industrial Production, 1720-1971

(average annual percentage rates of increase)

Period	World trade	World industry
1720-1780	1.10	1.5*
1780-1830	1.37	2.6
1820-1840	2.81	2.9
1840-1860	4.84	3.5
1860-1870	5.53	2.9
1870-1900	3.24	3.7
1900-1913	3.75	4.2
1913-1929	0.72	2.7
1929-1938	-1.15	2.0
1938-1948	0.00	4.1
1948-1971	7.27	5.6

*1705-1785.

Source: W.W. Rostow, The World Economy: History & Prospect, page 67.

Table 2

Consumer Price Indexes in the United States and Other Major Industrial Countries, 1955-74

(1970 = 100)

	United States	Average annual rate of increase (%)	Canada	Average annual rate of increase(%)	Japan	Average annual rate of increase(%)	France	Average annual rate of increase(%)
1955	69.0		69.9		52.6		50.4	
1956	70.0		70.9		52.8		51.4	
1957	72.5		73.2		54.4		53.2	
1958	74.5		75.0		54.9		61.2	
1959	75.4		75.9		54.7		65.0	
1960	76.3	1.5	76.7	1.7	56.7	3.8	67.3	4.9
1961	77.0		77.1		59.7		69.5	
1962	77.9		78.0		63.8		72.9	
1963	78.8		79.4		69.2		76.1	
1964	79.9		80.8		71.9		79.0	
1965	81.3		82.8		76.7		81.0	
1966	83.6		85.9		80.6		83.2	
1967	86.0		88.9		83.8		85.4	
1968	89.6	4.1	92.6	3.8	88.3	5.5	89.3	1.7
1969	94.4		96.8		92.9		95.0	
1970	100.0		100.0		100.0		100.0	
1971	104.3		102.9		106.3		105.5	
1972	107.7		107.8		111.5		111.7	
1973	114.4	8.6	116.0	8.9	124.5	16.9	119.9	10.1
1974	127.0		127.9		152.4		135.5	

	Germany	Average annual rate of increase(%)	Italy	Average annual rate of increase(%)	Netherlands	Average annual rate of increase(%)	United Kingdom	Average annual rate of increase(%)
1955	70.1		62.2		57.8		59.0	
1956	71.9		64.3		58.9		61.9	
1957	73.3		65.2		62.7		64.2	
1958	75.0		67.0		63.8		66.2	
1959	75.7		66.7		64.3		66.5	
1960	76.7	2.3	68.2	3.4	66.4	3.1	67.2	3.1
1961	78.5		69.7		67.0		69.5	
1962	80.9		72.9		68.3		72.5	
1963	83.3		78.3		70.9		73.9	
1964	85.2		83.0		74.8		76.3	
1965	88.1		86.7		78.7		80.0	
1966	91.2		88.8		83.3		83.1	
1967	92.5		91.6		86.0		85.2	
1968	93.9	3.4	92.8	3.6	89.1	5.7	89.2	5.6
1969	96.4		95.2		95.8		94.0	
1970	100.0		100.0		100.0		100.0	
1971	105.3		105.0		107.5		109.5	
1972	111.1		110.9		115.9		117.0	
1973	118.8	6.8	122.4	12.4	125.2	8.6	126.7	11.7
1974	126.8		140.0		136.6		145.9	

Source: Rostow, op.cit. pages 351-352 (quoting Economic Report of the President (February 1975), p.359).

Table 3

Developing Countries: Distribution of Gross Domestic Product, 1960 and 1975a

(per cent)

	Agriculture		Industry		Services	
	1960	1975	1960	1975	1960	1975
Low Income Countries	50	41.	17	23	33	36
Middle Income Countries	22	15	32	38	46	48

a Median values, at current prices.

Source: World Bank, World Development Report 1979, pages 15 and 130.

Table 4

Developing Countries: Growth of Production, 1960-75

(average annual rates, per cent)

	Gross Domestic Product	Agriculture	Industry	Services
Low Income Countries	3.1	2.1	5.4	3.7
Middle Income Countries	6.0	3.5	7.9	6.7

a Median values, at 1975 prices.

Sources: World Bank, World Development Report 1978, page 4.

Table 5

"Discomfort Index" for Seven Major Countries, 1959-76

Year	Unemployment rate (%) (1)	Increase in consumer prices (%) (2)	"Discomfort Index" (1+2)
1959	3.8	1.2	5.0
1960	3.4	1.7	5.1
1961	3.6	1.6	5.2
1962	3.1	2.1	5.2
1963	3.2	2.3	5.5
1964	2.9	2.0	4.9
1965	2.7	2.6	5.3
1966	2.5	3.2	5.7
1967	2.8	2.8	5.6
1968	2.7	4.0	6.7
1969	2.6	4.9	7.5
1970	3.1	5.6	8.7
1971	3.7	5.0	8.7
1972	3.7	4.4	8.1
1973	3.2	7.7	10.9
1974	3.7	13.4	17.1
1975	5.4	11.1	16.5
1976	5.3	8.1	13.4

Source: OECD.

Table 6

Gross domestic product and per capita GDP, 1975 and 2000: Comparisons for selected scenarios

	Growth of GDP (per cent per annum)				Proportion of world GDP (per cent)					GDP per capita (1970 US $)					Growth of GDP per capita (per cent per annum)			
Period	1975-2000				1975	2000				1975	2000				1975-2000			
Scenario	A	B2	C	D		A	B2	C	D		A	B2	C	D	A	B2	C	D
1. United States	3.2	2.4	2.4	2.7	28.7	19	18	24	21	5132	9870	8130	7780	8450	2.7	1.9		
2. Canada	3.8	2.9			2.7	2	2			4531	8730	7020			2.7	1.8		
3. Japan	6.9	6.0	2.5	5.6	6.8	10	10	5	9	2371	10260	8230	3590	7560	6.0	5.1	1.7	4.7
4. EEC	4.4	3.3	2.0	3.0	18.5	16	14	13	14	2752	7960	6110	4450	5680	4.3	3.2	1.9	2.9
5. Western Europe other than EEC	6.0	5.4	2.7	4.6	4.0	5	5	3	4	1049	3950	3420	1790	2800	5.4	4.8	2.2	4.0
6. Australia and New Zealand	3.8	3.2	2.4	3.7	1.3	1	1	1	1	2568	5600	4910	4020	5490	3.2	2.6	1.8	3.1
Total OECD	4.4	3.5	2.3	3.4	62.0	53	50	47	49	3044	8000	6470	4880	6270	3.9	3.1	1.9	2.9
7. Eastern Europe	5.0	4.8	4.2	4.8	15.9	16	18	20	18	1700	5330	5080	4730	5080	4.7	4.5	4.2	4.5
8. Latin America	7.0	6.5	5.3	6.3	6.2	10	10	11	10	745	2300	2040	1730	1950	4.6	4.1	3.4	3.9
9. South Asia	5.0	4.5	3.9	4.0	2.2	2	2	2	2	101	210	184	148	160	3.0	2.4	1.5	1.9
10. South East Asia	7.0	6.3	5.6	6.1	2.2	4	4	4	3	224	720	620	510	580	4.8	4.2	3.3	3.9
11. China	6.0	6.0	5.5	6.0	5.6	7	8	9	8	256	800	800	710	800	4.7	4.7	4.2	4.7
12. North Africa and Western Asia	7.0	6.0	5.4	6.0	3.9	6	6	6	6	845	2450	1940	1680	1940	4.3	3.4	2.8	3.4
13. Sub-Saharan Africa	5.9	4.4	3.6	5.7	1.3	2	1	1	2	164	380	266	223	360	3.4	2.0	1.2	3.2
Total, Third World	6.5	6.0	5.3	5.9	21.6	31	32	33	32	290	860	790	656	750	4.4	4.1	3.3	3.9
World total	5.0	4.4	3.5	4.3	100	100	100	100	100	960	2210	1920	1530	1850	3.4	2.8	1.9	2.7

Note: South Africa is not included among regions 1 to 13 but is included in the world total.
Value data in terms of 1970 US$.

Source: OECD Interfutures, page 89; growth rates calculated by Commonwealth Secretariat from Interfutures, page 89.

Table 7

Trends in World Industrial Production, 1970 and 2000

Product	Growth of world value-added in industry, 1970-2000 (per cent per annum)								Regional distribution of value-added in industry (per cent)									
	Machinery		Other Products		Total				Machinery			Other Products			Total			
Scenarios									1970	2000		1970	2000		1970	2000		
	A	B2	A	B2	A	B2	C	D		A	B2		A	B2		A	B2	C	D
OECD	4.6	3.7	3.9	3.2	4.0	3.4	2.3	3.3	75.4	61.6	59.4	67.1	49.2	48.6	68.5	51.4	50.5	48.7	49.6
United States	3.5	2.6	3.0	2.2	3.1	2.3	2.3	2.4	31.1	18.7	17.0	30.4	17.2	16.4	30.3	17.3	16.5	23.1	18.7
Canada	4.1	3.2	3.8	2.9	4.0	2.9			2.9	2.2	1.9	2.7	2.0	1.8	2.7	2.0	1.8		
Japan	6.3	6.0	6.0	5.6	6.0	5.7	2.6	5.0	10.6	13.5	15.0	6.5	8.4	9.2	7.1	9.0	10.2	5.8	8.5
EEC	4.4	3.5	3.7	3.1	3.8	3.2	2.1	3.1	26.4	22.0	21.0	21.3	14.5	14.8	22.4	15.8	15.9	14.9	15.7
Other countries	6.4	4.8	5.4	4.4	5.5	4.4	2.8	4.4	4.5	5.8	4.4	6.5	7.2	6.3	6.2	7.0	6.1	4.9	6.6
Eastern Europe	6.4	5.6	5.2	4.9	5.4	5.0	4.4	5.0	17.2	21.8	21.5	19.9	21.0	23.6	19.3	21.0	23.2	24.0	23.0
China	8.1	8.0	7.3	7.3	7.4	7.3	5.9	7.3	2.7	4.3	6.3	4.5	8.8	10.2	4.2	8.0	9.6	8.2	9.6
Third World	9.0	8.3	7.5	6.9	7.6	7.1	6.4	7.3	4.6	12.3	12.6	8.4	17.2	17.9	7.7	16.4	16.7	19.1	17.7
Latin America	9.2	8.7	7.9	7.4	8.1	7.6	7.1	7.8	3.0	8.2	8.9	4.2	9.7	10.0	4.0	9.4	9.9	11.0	10.7
East and South-East Asia	8.4	7.8	8.3	7.5	7.2	6.5	7.5	7.2	1.3	1.7	1.8	1.2	3.1	3.1	2.4	3.0	2.9	3.6	2.7
South Asia			5.5	4.6			4.1	4.5		1.2	1.1	1.3	1.5	1.6		1.5	1.5	1.4	1.4
North Africa/Middle East	10.0	7.5	7.3	6.4	7.5	6.4	7.0	7.0	0.3	1.1	0.6	0.9	1.9	1.8	0.8	1.7	1.6	2.4	2.0
Black Africa	5.5	4.6	5.4	4.6	5.4	4.6	3.4	4.7	0.1	0.1	0.1	0.7	1.0	1.0	0.5	0.8	0.8	0.7	0.9
World	5.4	4.6	5.0	4.3	5.0	4.4	3.2	4.4	100	100	100	100	100 a	100	100	100 b	100	100	100

a Adds to 96.2 in original source.

b Adds to 96.8 in original source.

Source: OECD Interfutures, pages 330-1.

Table 8

The pattern of trade in manufactures, 1970 and 2000

(percentages)

Initial situation

Importing areas

Exporting areas: 1970	A	B	C	Total
A	51.8	5.3	25.8	82.9
B	3.4	0.9	2.5	6.8
C	8.3	0.9	1.1	10.3
Total	63.5	7.1	29.4	100.0

Scenario A

Importing areas

Exporting areas: 2000	A	B	C	Total
A	40.8	7.4	19.6	67.8
B	6.4	1.6	6.0	14.0
C	9.7	2.8	5.7	18.2
Total	56.9	11.8	31.2	100.0

Scenario B2

Importing areas

Exporting areas: 2000	A	B	C	Total
A	36.2	8.7	20.1	65.1
B	6.5	1.5	6.0	14.0
C	11.8	3.3	5.8	20.9
Total	54.5	13.5	31.9	100.0

Scenario C

Importing areas

Exporting areas: 2000	A	B	C	Total
A	45.2	8.3	10.1	63.6
B	6.9	1.3	6.5	14.7
C	5.3	3.4	12.9	21.7
Total	57.5	13.0	29.5	100.0

Scenario D

Importing areas

Exporting areas: 2000	A	B	C	Total
A	23.8	8.4	33.6	65.8
B	6.2	0.6	3.8	10.6
C	15.9	2.7	5.0	23.6
Total	45.9	11.7	42.4	100.0

Note: A = Developed market economy countries.
B = Centrally planned economy countries (including China).
C = Developing countries (excluding China).

Source: OECD Interfutures, page 332

ANNEX

IMPACT OF OIL ON THE BALANCE OF PAYMENTS OF DEVELOPING COUNTRIES

The following brief notes provide information on:

I. the share of oil in the total imports of net oil-importing developing countries;

II. the financing of current account deficits;

III. debt service implications of external borrowing;

IV. the adjustment experience of developing countries to the external shocks of the 1970s; and

V. projections of the short-term increase in the oil import bill and the current account deficit.

I. Share of oil in total imports

2. Available data on crude petroleum imports suggest that the gross oil import bill for net oil importing developing countries increased from $4.4 billion in 1973 to $18.9 billion in 1978. This increase of 330 per cent reflects almost entirely the oil price increases, since the quantities imported changed little over the period – 3.7 million barrels per day in 1973 to 4.4 million barrels per day in 1978 or an increase of less than 20 per cent. (Nine countries[1] feature prominently as net importers of crude; these nine countries accounted for 72 per cent of all net oil imports of developing countries between 1973 and 1978).

1. These nine countries are: Singapore, Cuba, Thailand, Philippines, India, Taiwan, Turkey, Republic of Korea and Brazil.

3. While the oil imports of the majority of net oil-importing developing countries may not be large in absolute terms and the quantities may have even declined in some cases, their values increased sharply as a proportion of the total imports of these countries. On average, the available data for 36 net oil-importing developing countries suggest that oil imports as a proportion of total imports rose from 7 per cent to nearly 14 per cent between 1973 and 1978, with the proportions being considerably higher in a number of cases (see Table 1)[1].

II. Financing of current account deficits

4. Owing to a combination of the oil price increases, the rise in the prices of traded goods, and general global recession, the combined current account deficit of net oil-importing developing countries almost quadrupled between 1973 ($8.7 billion) and 1974 ($31.8 billion). The deficit reached $36.3 billion in 1975 and, after some improvement in 1976 and 1977, it was estimated to be $29 billion in 1978 and over $46 billion in 1979.

5. There was considerable variation among groups of net oil-importing developing countries with regard to the size and financing of their deficits. Low-income countries' deficits are estimated to have increased 2.7 times between 1973 and 1979, compared with 5.3 times for all net oil-importing developing countries and 4.5 times for major exporters of manufactures.

6. Taking the larger grouping of all non-oil developing countries (data for net oil-importing countries are not available), in 1973 the whole of the current account deficit was less than the total of official unrequited transfers, direct investment inflows and long-term official loans to these countries. Since then, with the exception of 1977, increased flows from these sources have not been able to match the tremendous increases in the current account deficits. These countries therefore had to resort to large-scale short- and long-term private borrowing (see Table 2). As regards private borrowing, countries such as Brazil, Mexico, the Philippines, Korea and Argentina, with access to international capital markets, were at opposite ends of the spectrum from Kenya, Tanzania and Sri Lanka. Low-income countries have had to rely to a far greater extent on officially provided long-term capital to finance their deficits[2]. Those countries better able to borrow internationally were able to sustain relatively high import growth and increased current account deficits.

7. A notable feature of international lending during the period since 1973 has been the rapid increase in commercial bank lending - this grew by 43 per cent on average. Relatively little use was made of IMF credit to finance deficits. Even when there was recourse to Fund resources, drawings were primarily from the compensatory financing facility and the oil facility, both of which sources carry low levels of conditionality.

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1. Data for these 36 countries include oil imports other than crude petroleum.
2. Eighty-three per cent of current account deficits of low-income countries was financed by official transfers between 1973 and 1978 compared with 36% in the case of the middle-income countries.

III. Debt service implications

8. Increased borrowing left many non-oil developing countries with greatly increased debt service commitments. The growth of external debt, the heavy reliance on bank financing, and the shortening of loan maturities resulted in a $16 billion increase in debt service payments from developing countries between 1973 and 1978, or an increase of 2½ times over the period. Interest payments rose proportionately more than amortization, reflecting greater use of relatively expensive commercial bank credits and the postponement of amortization payments. While the debt service commitments for future years were increasing even more rapidly, a significant number of countries were already faced with debt servicing difficulties in 1978. As at end 1978, eighteen countries were classified by the IMF as having debt servicing problems[1]. (The IMF classifies countries as having debt servicing problems if current account payment arrears that constitute an exchange restriction are reported as of the end of a given year, or if a multilateral debt renegotiation has recently been conducted or requested.)

9. To get some idea of the combined burden of financing oil imports and meeting debt service commitments in relation to countries' (merchandise) export earnings, illustrative country data are included in Table 3. For a number of countries, oil imports and debt service absorbed between 31 and 60 per cent of their merchandise export earnings in 1978.

IV. Adjustment experience of developing countries in the 1970s

10. While some countries were able successfully to finance their much enlarged deficits, net oil-importing countries as a group were forced to implement strenuous and sometimes painful policies of adjustment. In fact, there is considerable evidence to suggest that the combined annual deficits of net oil-importing countries in real terms (i.e. after taking into account inflation and growth) during 1974-78 were not significantly larger than in 1973. Thus adjustment often involved serious compression of imports and curtailment of economic activity and growth.

11. Detailed information on the economic impact on individual developing countries of the international economic situation of the early to mid-1970s is available in a UNDP/UNCTAD study of a sample of thirteen developing countries.[2]

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1. These countries were Congo, Dominican Rep., Gabon, Ghana, Guinea, Guinea Bissau, Guyana, Jamaica, Madagascar, Nicaragua, Pakistan, Peru, Sierra Leone, Sudan, Togo, Uganda, Zaire and Zambia.

2. The countries in the sample are Brazil, India, Indonesia, Ivory Coast, Jamaica, Kenya, Republic of Korea, Peru, Philippines, Sri Lanka, Tanzania, Uruguay and Zambia. See UNDP/UNCTAD, The balance of payments adjustment process in developing countries. Report to Group of Twenty-four, 1979.

It was expected that there would be variation between the experiences of individual countries, depending on their "initial conditions", objective capacity to adjust, subjective assessments of duration and severity of external disequilibrating forces, etc., but certain common threads do emerge from the study. These are set below:

(i) during 1974-1976 all the countries experienced at least one year of sharp deterioration in their current accounts; for most of the countries, greatly increased current account deficits characterized the whole period;

(ii) while this current account deterioration was accompanied by increased long-term capital inflows, basic balances for most of the countries swung into deficit during one or more years after 1973, leading to recourse to payments finance and reserve drawings;

(iii) over the same period (1974-76) overall economic performance deteriorated in most of the countries - most of them recorded a slow-down in growth compared with 1971-73; at the same time price inflation accelerated in all the countries;

(iv) price effects (movements in the prices of internationally traded goods) may have been the dominant source of change in trade accounts - negative price effects in particular, were directly associated with deteriorations in the trade accounts;

(v) changes in terms of trade had a discernible impact on countries' national incomes - rough estimates by UNDP/UNCTAD show that nine of the thirteen countries in their sample suffered once-for-all losses in national income of between 4 and 20 per cent, (five of them of more than 10 per cent) due to adverse movements in their terms of trade;

(vi) only a small number of countries (such as Brazil, Ivory Coast and Korea) was able to adjust trade balances while increasing their command, in real terms, over goods and services from abroad, i.e. increasing their import capacity; some countries suffered deterioration in both trade balance and import capacity; [1]

(vii) there was some evidence of a direct relationship between the level of imports (particularly 'developmental' imports) and GDP growth - those countries in which there was no significant compression of imports during 1974-76 recorded increases in output and investment which were significantly higher than in those where significant import compression took place;

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1. Data in Table 4 give some idea of the relationship between trade balances and import capacities for individual countries, and of the influence of terms of trade changes on national income.

(viii) governments of non-oil developing countries employed the full range of trade, exchange-rate and other macro-economic policies in their attempt to counter the effects of the international economic situation of the 1970s. Some of them consciously attempted to marry short- and long-run planning; but they faced severe problems and had few successes; and

(ix) very little of the international adjustment took the form of an increase in exports from the non-oil developing world - a fact which is probably a major shortcoming of the process of international adjustment.

V. Oil import bills and current account deficits in the short-term

12. With aggregate net imports of crude petroleum estimated at approximately 4 million barrels per day in 1980, and given the increase in prices since 1978, net oil-importing developing countries face an incremental oil bill of about $24 billion in 1980.

13. After taking account of other likely direct and indirect influences on their balance of payments, the current account deficits of net oil-importing developing countries may exceed $60 billion by end-1980.[1] With increasing doubts about the capacity of the international banking system to continue to provide increasing amounts of finance to these countries, and with the grave economic and social difficulties that could result from even further adjustment, the already grim prospects facing non-oil developing countries are likely to be aggravated. The international community will have to set in motion significant remedial action if the worst fears are not to be realised.

1. A 1980 deficit of $62 billion has been projected by the IMF for net oil-importing developing countries.

Annex table 1

Oil importing developing countries: oil imports

Country	Oil imports		As percent of total imports	
	1973	1978	1973	1978
	$ million			
Bangladesh	92	167	10.5	12.2
Barbados	4	11	2.4	3.5
Burundi	2	7	6.5	7.1
China (Taiwan)	99	1,586	2.6	14.4
Costa Rica	17	45	3.7	3.8
Cyprus	24	80	5.3	10.6
El Salvador	19	73	5.1	7.1
Ethiopia	20	63	9.3	13.8
Fiji	20	42	9.1	11.8
Gambia, The	2	10	6.3	9.9
Guatemala	27	69	6.3	6.4
Honduras	21	57	8.0	8.2
India	308	1,060	9.6	14.3
Ivory Coast	26	170	3.7	9.7
Jamaica	71	242	10.5	26.0
Kenya	47	239	7.6	14.1
Korea, Rep. of	277	2,210	6.5	14.8
Madagascar	15	52	7.4	15.0
Malawi	7	30	5.0	8.8
Mauritius	12	46	7.1	9.2
Morocco	55	301	4.8	10.1
Nicaragua	17	78	5.2	13.1
Niger	7	15	8.1	11.8
Pakistan	55	408	5.6	12.3
Panama	88	208	17.5	24.2
Paraguay	6	43	4.9	11.2
Philippines	166	907	9.2	17.7
Senegal	21	71	5.8	11.4
Sierra Leone	6	33	3.8	18.2
Sudan	25	89	5.7	9.1
Thailand	172	813	8.4	15.2
Togo	5	20	5.0	7.0
Upper Volta	9	18	11.4	8.6
Uruguay	51	33	17.9	4.4
Yemen P.D. Rep.	68	220	39.8	65.7
Zambia	32	104	4.8	12.5
TOTAL	1,893	9,620	7.1	13.9

Source: Commonwealth Secretariat estimates based on IMF, International Financial Statistics.

Annex table 2

Non-oil developing countries: current account financing, 1973-79

(billion US dollars)

	1973	1974	1975	1976	1977	1978	1979
Current account deficit	11.3	30.6	38.2	25.5	21.0	31.9	42.0
Financing through transactions that do not affect net debt positions	8.4	10.9	11.3	10.6	11.9	12.8	16.7
of which:							
Net unrequited transfers received by governments of non-oil developing countries	4.2	6.2	6.3	5.8	6.7	6.9	9.0
Net external borrowing	10.6	22.6	27.5	26.1	20.7	32.4	31.3
of which:							
Long-term from official sources, net	4.6	6.9	10.7	9.4	11.1	12.4	13.4
Other long-term borrowing from non-residents, net	5.9	9.5	11.0	12.9	11.8	17.9	16.7
Use of reserve-related credit facilities, net	0.1	1.4	1.7	3.4	0.4	0.3	0.1
Other short-term borrowing, net	0.9	4.6	6.3	4.2	-1.8	-0.9	n.a.

Source: IMF.

Annex table 3

Ratios of oil imports and debt servicing to exports [a]

1973 and 1978

(per cent)

	oil imports / exports		debt servicing / exports		oil & debt / exports	
	1973	1978	1973	1978	1973	1978
I. All non-oil developing countries [b]	7.5	14.9	14.7	20.8	22.2	35.7
II. Selected non-oil developing countries [c]						
Korea, Republic of	8.6	17.4	19.3	14.1	27.9	31.5
Bangladesh	25.7	30.4	2.8	17.1	28.6	47.5
Barbados	7.4	8.5	6.7	5.7	14.1	14.2
Cyprus	13.9	23.5	4.8	7.6	18.7	31.1
Fiji	21.3	20.7	1.8	4.6	23.1	25.3
Gambia, The	9.1	25.6	1.4	1.3	10.5	26.9
India	10.6	16.5	22.3	14.7	32.9	31.2
Jamaica	18.2	31.9	9.6	27.9	27.8	59.8
Kenya	9.8	23.4	6.2	11.8	16.0	35.2
Malawi	7.1	16.0	11.2	11.1	18.3	27.1
Mauritius	8.8	14.4	1.8	3.3	10.6	17.7
Sierra Leone	4.7	27.0	10.0	28.3	14.7	55.3
Zambia	2.8	11.6	31.6	27.8	34.4	39.4

a Merchandise exports only.

b Aggregate oil imports for all non-oil developing countries include crude petroleum only.

c Oil imports for individual countries are based on IMF sources which in some cases include refined as well as crude petroleum.

Source : IMF; World Debt Tables (IBRD); and Secretariat estimates based on UN World Energy Supplies, Series J, 1979.

Annex table 4

Changes in trade balances and in import capacity, 1974-77 and the effect of terms of trade on gross national income

	Change in trade balance[a] (millions of dollars)	Change in import capacity (per cent)	Change in trade balance[a] (millions of dollars)	Change in import capacity (per cent)	The influence of terms of trade changes on national income[d] (per cent)
	1974 to 1976		1976 to 1977		
Brazil	2,641	-25	2,487	30	-4.5
India	1,039	25[c]	-107	10[c]	-4.2
Indonesia	-710	19	1,749	6	49.3
Ivory Coast	90	24	311	8	17.5
Jamaica	-75	-5	162	-30	-16.5
Kenya	240	-13	79	-4	-13.0
Korea, Rep. of	1,333	36	295	24	-19.5
Peru	-724	15	419	-2	2.7
Philippines	-669	30	252	1	-4.6
Sri Lanka	183	-8	66	-1	-11.3
Tanzania	203	-20	-70	-5	-11.6
Uruguay	63	48	-28	-24	-7.7
Zambia	-180	-27	-162	-22	13.3

Source: UNDP/UNCTAD, op. cit. ppII-39 and II-43.

a Minus sign indicates increase in deficit or reduction in surplus.

b The sum of earnings from exports of goods and services, net receipts of transfers and long-term capital and changes in reserves and related items less gross payments on account of investment income. This sum is then deflated by changes in import prices.

c Merchandise export earnings deflated by import prices.

d Calculated from the formula: $dY/Y = -(P_m M/Y)(dP_m/P_m - a dP_x/P_x)$, where $a = P_x X/P_m M$. and where Y=real gross national income, E=real domestic expenditure, P_x and P_m =prices of exports and imports, respectively and X and M = quantum of exports and imports, respectively. Minus sign indicates decline in real gross national income.

THE LEAST DEVELOPED COUNTRIES : ECONOMIC TRENDS AND PROSPECTS

Economic Affairs Division
Commonwealth Secretariat

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The Least Developed Countries : Economic Trends and Prospects

CONTENTS

I. Introduction

1. The creation of a category of 'least developed countries' (LLDCs)[1] among the developing countries in November 1971 was the first formal recognition that terms such as 'developing countries' and 'the Third World' were general expressions for countries with widely different circumstances and needs. At present, thirty-one countries, with 257 million people or 12.5 per cent of the population of all the developing countries, are included in the United Nations list of LLDCs.

2. The main reason for identifying the hard-core poor countries was the conviction that their economies were so rudimentary that without special attention they did not have the capacity to take full advantage of the policy measures aimed at assisting the developing countries as a whole. Moreover, the growing preoccupation with 'basic needs' and 'poverty-oriented programmes' meant more donors wanted to concentrate their assistance where poverty was greatest.

3. The criteria used in identifying these countries were threefold : low per capita GDP ($100 or less in 1968); a low share of manufacturing in GNP (10 per cent or less in 1968); and a low literacy rate (20 per cent or less for persons above 15 years).

4. The definition of LLDCs has been the subject of arguments, some of which can be briefly mentioned here. First, it has been argued that the LLDCs are only one form in which 'spatial inequalities' in development might occur, and that the wider problem of regional backwardness need not coincide with national borders. Hence, to the extent that the present UN definition of 'least development' eliminates depressed areas within countries, the need for poverty-focused aid programmes is far greater than has so far been considered.(2) Secondly, it has been suggested that the criteria used for selecting LLDCs are too narrow - they provide an incomplete indicator of economic welfare - and the cut-off points, particularly in the case of GDP, are too arbitrary. Some composite indices, reflecting a much wider range of economic and social indicators should have been used.(3) Thirdly, the specification of the list is regarded as a formal recognition of the widely

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1. The original twenty-five countries identified as 'least developed' by the United Nations General Assembly in November 1971 were Afghanistan, Benin, Bhutan, Botswana, Burundi, Chad, Ethiopia, Guinea, Haiti, the Lao Peoples Democratic Republic, Lesotho, Malawi, Maldives, Mali, Nepal, Niger, Rwanda, Sikkim (now part of India), Somalia, Sudan, Uganda, United Republic of Tanzania, Upper Volta, Western Samoa and the Yemen Arab Republic. In December 1975, four countries (Bangladesh, Central African Republic, Democratic Yemen and The Gambia) were added to the list and in December 1977 two more countries (Cape Verde and the Comoros) were added.

2. See Percy Selwyn, "The Least Developed Countries as a Special Case", World Development, Vol. 2, 4-5, April-May 1974.

3. See A.I. MacBean, "Identifying the Least Developed in the International 'Line Up'", The World Economy, Vol. 2 No. 1, January 1979.

differing circumstances of the Group of 77 - a situation which may not always work toward strengthening the unity of the Group.

5. The purpose of this note, however, is not to pursue this debate in detail, but primarily to review the recent economic trends of the LLDCs and to outline some of the major infrastructural bottlenecks to their present and future development. Before examining the economic trends, it is perhaps useful to consider briefly the basic characteristics of the LLDCs.

II. Major Characteristics of the Least Developed Countries

6. Table 1 gives a statistical summary of the basic economic and social characteristics of the LLDCs. Depending on location, geography and population, there are substantial differences in the development potential of these countries.

7. Sixteen of them, mostly in interior Africa, are landlocked. Many are also at a considerable distance from the major developed country markets, and have little access to regular shipping lanes, except perhaps for Haiti and some of the countries in West Africa. This means that they are likely to be burdened with fairly heavy transport costs.

8. Most LLDCs are small in terms both of land area and size of population. Only seven out of the thirty-one have populations greater than 10 million. Bangladesh - a nation whose features link it more closely to the rest of South Asia than to any such broad groupings as LLDCs - is the most striking exception, with over 82 million people. Other relatively populous LLDCs such as Afghanistan, Ethiopia, Sudan and Tanzania, have rather low population densities. This means that, even discounting their low incomes per capita, their markets are too small for medium-size industrial manufacturing enterprises to be viable.

9. Geographically more striking is the fact that all but a few of the smaller countries on the list are located contiguously in two areas, which can be characterised as the most depressed regions of the world. One such region extends across the middle of Africa, with the exception of Kenya and some West African coastal states. The other, beginning with Afghanistan, stretches eastwards across South Asia and some East Asia countries. The problems of LLDCs have not always been perceived in the context of poverty belts extending over entire regions of the world. Having poor neighbours is neither a necessary nor a sufficient explanation for any country's poverty. But a country which is part of such a large impoverished region tends to find it more difficult to surmount poverty, whereas one located in a prosperous and rapidly developing region is likely to derive many advantages from the economic level and rapid progress of its neighbours.(1)

10. Because many of these countries lie in semi-arid zones, they suffer from a shortage of arable land. In most cases, even arable farmland is not being used to its full potential. Production of the principal cash crops is erratic because of the low level of technology and the consequent importance of weather and disease in influencing yields. On average, agriculture contributes about 44 per cent of GDP but employs about 83 per cent of the population, largely in subsistence farming. Even so, two-thirds of the

1. See J.F. Rweyemamu, Problems and Prospects of the Least Developed Countries, mimeograph, April 1978, page 4.

LLDCs are food-deficit countries.(1) Output fluctuations have very far reaching effects not only on rural nutrition and agricultural incomes, but also on export earnings, savings and investments, the demand for manufactured products, and the prices and supplies of urban food.

11. A corollary of the predominance of subsistence agriculture is the low level of industrialisation. The share of manufacturing in gross output is not more than 10 per cent in most LLDCs. This means that they cannot benefit significantly from trade measures relating to manufactured and semi-manufactured products, until such actions as are likely to stimulate industrial production and diversification are undertaken.

12. In terms of health, the LLDCs are also very poor countries. With few exceptions, average life expectations run from 39 years in Ethiopia to 46 in Malawi (see Table 1). Infant deaths per thousand live births are generally well over 145, compared to an average of 110 for the developing countries as a whole and 17 for developed countries. The ratio of population per physician is higher than the LDC average by a factor of nearly two or more in every case.

13. Low literacy rates are a particularly striking feature of the LLDC group. The average for the Third World is about 40 per cent for persons over 15 years, but the rates within the LLDCs run from a low of 8 per cent in Niger to 25 per cent in Botswana. Primary school enrolments are in most cases substantially below those of the other developing countries. Reflecting these patterns, modern mechnical skills are scarce and the overall administrative and governmental organisation of LLDCs is weak. In addition, economic infrastructure (communications, power, water and transport) is inadequate.

III. International Action in Assisting the Least Developed Countries

14. Following the official adoption of the category by the UN General Assembly in 1971, a comprehensive package of measures for the LLDCs was elaborated and unanimously adopted at UNCTAD III (Santiago, 1972) in Resolution 62 (iii). Since 1972, the situation and prospects of LLDCs have been kept under review. After the disruptions of the international economy in the early 1970s, UNCTAD IV (Nairobi, 1976) adopted further measures to assist not only the LLDCs but also developing island and landlocked countries.

15. At UNCTAD V (Manila, 1979), however, it was noted that "despite some improvement in the implementation of special measures, the economic performance of the least developed countries has been very unsatisfactory and the prospects remain, with a few exceptions, desperate. Progress in the implementation of these measures has been slow or lacking in many cases, and in any event has been inadequate to overcome the economic stagnation facing most of these countries. Furthermore, most of the special measures have been formulated in very general terms, specifying types of action which

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1. See National Foreign Assessment Centre (CIA), Least Developed Countries : Economic Characteristics and Stake in North-South Issues, page 3, May 1978.

should be undertaken in favour of the least developed countries, but not the rate or extent of such action".(1)

16. Against this background, UNCTAD V considered further proposals for special measures in favour of LLDCs and decided on "a substantially expanded programme of action", with both immediate and longer-term phases. The first phase or "the crash programme" is aimed at an immediate expansion of resources to strengthen efforts to improve nutrition, health, education, transport and communications, housing and job creation; to supply on a massive scale inputs for agricultural production such as fertilisers and pumps, and to provide technical assistance to overcome management and other urgent bottlenecks, in order to pave the way for much longer-term development. The long-term phase, i.e. the programme of action for the 1980s, is concerned with the identification of, and the mobilisation of international support for, transformational projects that could lead these economies to self-sustained development.(2)

17. Notwithstanding the overall lack of progress in the implementation of the special measures, there has been remarkable improvement in the volume of concessional financial flows to LLDCs since the 1972 Santiago resolution. Official Development Assistance (ODA) flows from DAC members to LLDCs increased from $786 million in 1972 to $2,191 million in 1977. Multilateral assistance increased from $289.2 million in 1972 to $951.8 million in 1977. The proportion of ODA flows going to LLDCs increased from 12.8 per cent in 1972 to 17.6 per cent in 1977. Financial flows from OPEC countries have become increasingly important. However, it should be noted that a substantial proportion of ODA, specially in the drought years of 1974-1975, was part of the special action taken by DAC members in favour of the most-seriously-affected (MSA)(3) countries - twenty-four of which are also included in the LLDC category - in the form of food grants and current import financing.(4) The course of official aid flows to LLDCs is given in Table 2.

18. However, the distribution of this aid has not always been consistent with need. Special historical, political, or trading links, and general donor support for the development objectives of certain recipients have influenced the allocation of aid to LLDCs. For instance, in 1976, 90 per cent of the aid from Socialist countries (including China) went to Afghanistan, Uganda and Sudan, and 89 per cent of that from OPEC to LLDCs went to the Sudan, Yemen Arab Republic and Yemen Democratic Republic.

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1. See UNCTAD, Outline for a substantial new programme of action for the 1980s for the least developed countries, TD/240, May 1979, page 2.
2. See UNCTAD Resolution 122 (V), E/1979/109, July 1979.
3. The following countries are MSAs but not least developed: Burma, Cameroon, Democratic Kampuchea, Egypt, El Salvador, Guinea Bissau, Guatemala, Guyana, Honduras, India, Ivory Coast, Kenya, Madagascar, Mauritania, Mozambique, Pakistan, Senegal, Sierra Leone, Socialist Republic of Vietnam and Sri Lanka.
4. See OECD, Development Cooperation, 1977 Review, Paris 1977, page 121.

19. The sectoral breakdown of DAC bilateral ODA commitments to LLDCs during 1973-1975 shows that 56 per cent of the aid was concentrated on short-term needs (current imports 15 per cent, food aid 35.3 per cent, budget support 2.7 per cent, emergency aid 2.8 per cent) and only 10 per cent on agricultural development programmes. This may have been inevitable in view of the economic difficulties these countries had to face during this period. Nevertheless, it means that only a small proportion of the resources flowing to them was directed to meeting the objectives of self-sustaining growth.

IV. Recent Economic Trends (1)

20. Table 3 gives a comparative summary of selected structural indicators for LLDCs and the developing countries as a whole. The following paragraphs contain a further comparative analysis of some of the key indicators in order to show the sharply lagging performance of the LLDCs.

(i) Growth of GDP

21. Despite the recession of 1974-1975, the developing countries as a whole made some progress during the period 1970-1977, with an average per capita GDP growth rate of 3.2 per cent, though this was lower than the target of 3.5 per cent set for the LDCs in the second UN International Development Decade. For the LLDCs, however, the growth performance was extremely disappointing, with an annual average rate of only 0.7 per cent. In fact, six of these countries (Cape Verde, Central African Republic, Comoros, Lao, Uganda and Upper Volta) experienced negative growth rates during this period. In order to underline the urgent need for special measures for the LLDCs, their historical growth rates (1960-1977) have been projected until 1990. This shows little change in the absolute levels of GDP per capita from their present low levels. Table 4 shows growth rates of LLDCs in comparison with those of all developing countries.

(ii) Agricultural and food production

22. In contrast to the 1960s when agricultural and food production roughly kept pace with population growth, the growth rate in agricultural production in LLDCs slowed to less than 2 per cent per annum during the first eight years of the 1970s, and was far below the 4 per cent target of the second UN International Development Decade, as shown in Table 5.

23. Within the above overall trends, however, particular country patterns differ considerably. For instance, two countries - Malawi and Sudan - showed improved agricultural and food production over the period 1970-1977, largely as a result of the application of new techniques. Food production per capita in Mali, Niger and Upper Volta - countries in the Sahel - fell considerably because of persistent drought during the early 1970s. Similarly, food production in Ethiopia and Uganda declined sharply because of political problems.

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1. The statistical data on LLDCs contained in this section were largely drawn from the UNCTAD Handbook on International Trade and Statistics, 1979.

(iii) Manufacturing production

24. The annual average growth rate of real GDP arising from manufacturing in LLDCs showed a significant slowdown in the 1970s, from 6.3 per cent in 1960-1970 to 5.2 per cent in 1970-1978, as compared to 7.2 per cent and 6.3 per cent in the developing countries as a whole during the same periods. In 1977, the share of manufacturing in GDP averaged only 9 per cent in the LLDCs and 19 per cent in all developing countries. However, there were large variations among individual countries : from 3 per cent in Lao, Lesotho and Western Samoa, to 13 per cent in Haiti and Mali respectively.

(iv) Gross domestic investment

25. The growth rate of domestic investment in LLDCs, which had been relatively favourable during the 1960s, was also significantly lower on average during the 1970-1977 period, as shown in Table 6. Investment actually declined in Bangladesh, Ethiopia, Comoros, Mali and Uganda.

(v) External trade

26. The overall performance of the LLDCs in external trade is very low and showed a marked stagnation in the 1970s. In 1977, their exports constituted 11.3 per cent of GNP, compared with 16.6 per cent for the developing countries as a whole (excluding the major petroleum exporters). Even allowing for the fact that a significant portion of foreign trade in most of these countries goes unrecorded, the summary of key trade results given in Table 7 is indicative of the position.

27. Despite the doubling in real terms of total external financial flows to LLDCs between 1970 and 1976, the import volume of these countries grew only slowly. In per capita terms, imports reached $35.2 in 1978, only $2.9 more than in 1970. The per capita export purchasing power in 1978 averaged only $17.5 and had actually declined by $ 6.2 compared with eight years earlier. LLDC imports in value terms increased at an average annual rate of 16.0 per cent between 1970 and 1978, compared with 19.5 per cent for all non-OPEC developing countries. Most of this increase was due to rising costs of grain and fuel. On average, nearly 20 per cent of the LLDC import payments during this period went on food. The second single most important LLDC import was petroleum which accounted for a steadily growing share of imports into each country.

28. The very low absolute level of per capita exports and downward trend in real terms is one of the major structural handicaps of the LLDCs. The failure of these countries to achieve significant growth in per capita output during the 1970s is, inter alia, directly related to foreign exchange constraints which sharply limited their ability to import the resources needed to stimulate and support growth. The increase in concessional assistance to LLDCs during the decade was offset by the decline in their export purchasing power.

29. Moreover, in contrast to all developing countries, the commodity structure of the exports of the LLDCs as a group is more heavily concentrated in food items and agricultural raw materials, as indicated by Table 8.

30. This dependence on exports of a few primary products makes LLDCs vulnerable to sudden price swings and to climatic influences; moreover, for none of the commodities does world demand grow as fast as for manufactured goods or fuels.

V. Some Critical Infrastructural Needs of the Least Developed Countries

31. To sum up, the main structural handicaps of the LLDCs include :

- very high proportion of the population in the subsistence sector ;
- extremely low agricultural productivity and weak agricultural support institutions, necessitating heavy dependence on food imports ;
- extremely low level of exploitation of natural resources - minerals, energy, water, etc. - because of lack of knowledge, skills and finance for resource development ;
- limited development of manufacturing industry ;
- extremely low level of exports per head of population and, even with aid flows, very limited absolute availabilities of imports ;
- acute scarcity of skilled personnel at all levels ;
- very weak institutional and physical infrastructure, including administration, education, health, housing, transport and communication ; and
- one or more major geographical and climatological handicaps, such as remoteness, drought and desertification.

32. The overall performance of the LLDCs is likely to worsen - they will be even poorer, have higher food deficits, and be even further disadvantaged relative to the rest of the world by 1990 than they are today.

33. To reverse the record of decline and stagnation of the 1970s and to provide for accelerated development in LLDCs will require extraordinary efforts by the countries themselves, along with a substantial expansion of support from the international community. If the LLDCs accept this challenge, they will need to make maximum effort to mobilise domestic resources in the form of increased savings and use of trained manpower.

34. However, until the LLDCs can make more progress with social overhead investments in agriculture, transport, communications, health and education, they are not themselves in a position substantially to finance a reversal of past low growth rates. Therefore, substantially increased aid, largely on grant terms, in support of well designed development programmes

is essential. In UNCTAD's "Comprehensive new programme of action for the LLDCs", it is proposed that efforts should be made to develop and implement programmes which could double the national income of each of the LLDCs by 1990, as compared to the levels reached in the late 1970s. To bring this about, it is estimated that net disbursements of concessional assistance to these countries should be raised at least fourfold in real terms, i.e. from about $3.5 billion in 1977 to about $14 billion by 1990. If the objectives of the decade are to be realised, it is important to increase rapidly the flow of concessional resources early in the 1980s so that the bulk of the proposed increase is achieved by mid-decade.

35. It is not feasible to formulate detailed goals and objectives which would apply equally to all the LLDCs. Each country will have to elaborate its own development programme. However, there a number of key broad areas which ought to be given greater attention by all LLDCs. These are: (a) agriculture; (b) mineral, energy and water resources; (c) physical infrastructure; (d) manufacturing; and (e) eradication of disease.

(i) Agriculture

36. With more than 80 per cent of the population of the LLDCs dependent on agriculture, this sector has to be the core of their development programmes. Progress in agriculture has been the most sluggish and the requirements for its transformation are enormous. The major changes needed to accelerate agricultural production and to attain food self-sufficiency in LLDCs include:

- modernising the production process by encouraging increased use of inputs, particularly water and fertilisers, and improved technology ;

- improving human resources and institutional structures in rural areas to ensure equitable access to land and water for the poorest people ;

- improving the physical infrastructure by means of considerable investment in land development, irrigation, transport, processing and marketing ;

- increased financial flows to support larger use of inputs ; and

- appropriate changes in the production mix for domestic consumption and export.

(ii) Mineral, energy and water resources

37. Major emphasis should be placed on the exploration of mineral, energy and water resources. Many LLDCs have not been able to undertake a systematic survey of their resources, particularly minerals. There is thus a need to improve mineral prospecting and exploitation in these countries, especially those minerals with a high growth potential. This will require heavy capital outlays on infrastructure, especially on transport. The present timing of these investments appears propitious for investors in view of the expected demand and the current underutilisation of capacity, especially

of transport and mining equipment in the industrial countries.(1) International assistance to LLDC governments in planning, evaluating, negotiating and executing mining development should receive greatly increased support. Also, LLDCs have a significant potential for exploiting solar or wind energy and energy from other non-conventional sources, utilisation of which could reduce imports. The international community should help finance projects in this area.

(iii) Physical infrastructure

38. A major emphasis must be placed on the development of the basic physical infrastructure needed to support the improvement of the productive sectors as well as to support essential social services. These include transport and communications, both major trunk lines and feeder routes, ports and airports, water and irrigation development, storage and distribution facilities, hospital and school buildings, and housing. Investment in such facilities will often be very costly and may require long gestation periods but the facilities are crucial to the structural transformation of the LLDCs.

(iv) Manufacturing

39. As indicated earlier, per capita growth of manufacturing in the LLDCs declined significantly in the 1970s, compared with the 1960s, and without substantial international assistance it may deteriorate further during the 1980s and 1990s. To avoid this, the LLDCs, with strong external support, should undertake ambitious programmes of industrial development, particularly in small-scale agro-based and agro-support industries, as one of the keys to achieve more rapid growth. A minimum target (as recently proposed by UNIDO) for any such effort should be to increase the average annual growth of value-added in manufacturing from the 2.25 per cent achieved during 1970-1976 to 8 per cent in 1990.

(v) Eradication of disease

40. The economic development of the LLDCs, especially those in Africa, is still hampered considerably by tropical diseases. Most of these are water-based, e.g. schistomiasis and malaria; others are arthropod-borne infections, e.g. river-blindness and sleeping sickness. The prevention and control of the water-related diseases is not possible unless there are improvements in water supply and sanitation. In the case of arthropod-borne infections, control is through the application of insecticides to the localised breeding sites of parasites. This is a time-consuming and expensive process. In view of the large area affected and high costs involved in the necessary research and control operations, substantially increased external support will be crucial if such diseases are to be eradicated.

Table 1

Least-developed Countries: Economic and Social Characteristics

Countries	Population	GDP per capita		Manufacturing share in GDP	Food production: average annual growth rates		Exports: average annual growth rates	Education		Health	
		Levels	Average annual growth rates					Adult literacy rate	Primary school enrolment rate	Life expectancy at birth	Inhabitants per physician
	(millions)	(US$ at 1976 prices)	(per cent)	(per cent)	(per cent)		(per cent)	(per cent)	(per cent)(f)	(years)	(number)
	1977	1977	1970-1977	1977	1970-1974	1970-1978[c]	1970-1978	1977	1977	1977	1976
Afghanistan	14.74	135	1.2	17[b]	5.1	3.1	17.4	12.0	18.0	42.0	28,290
Bangladesh	82.71	90	1.3	8	0.2	1.9	3.0	22.0	83.0	47.0	11,350
Benin	3.29	175	0.4	7	1.1	1.8	-4.9	11.0	53.0	46.0	34,380
Bhutan	1.23	75[a]	..	..	2.4	2.1	..	..	..	43.6[d]	..
Botswana	0.71	449	4.7	7	6.3	4.2	27.6	25.0	92.0	48.0	..
Burundi	4.14	82	0.7	10	3.4	2.8	17.0	10.0	22.0	45.0	45,430
Cape Verde	0.31	235	-4.6	2	..	..	4.6	37.0	..	50.0[e]	..
Central African Republic	1.87	218	-3.3	8	3.7	2.4	14.8	..	79.0	46.0	29,410
Chad	4.21	122	0.9	11	-2.0	1.2	10.2	15.0	41.0	43.0	41,160
Comoros	0.32	220	-2.7	9	..	..	9.2	20.0	51.0	46.0	..
Ethiopia	28.98	102	0.4	10	-0.2	-0.0	12.8	10.0	23.0	39.0	84,850
Gambia	0.55	212	2.3	1	1.6	-0.2	16.2	10.0	32.0	41.0	..
Guinea	4.64	185	0.4	7	-1.3	0.4	27.5	9.0	33.0	44.0	15,500
Haiti	4.75	249	2.0	13	1.9	0.8	19.1	23.0	49.0	51.0	11,170
Lao	3.46	100	-2.6	3	2.0	1.9	13.2	..	85.0	42.0	..
Lesotho	1.25	142	2.2	3	1.6	1.4	24.5	40.0	19.0	50.0	17,800
Malawi	5.53	143	4.4	9	5.8	2.6	15.1	25.0	56.0	46.0	48,500
Maldives	0.14	121[a]	..	..	..	..	5.0	..	..	..	..
Mali	6.12	93	0.6	13	-4.8	2.6	18.5	10.0	28.0	42.0	32,460
Nepal	13.14	99	0.4	10	1.8	1.2	11.4	19.2	60.0	45.0	38,650
Niger	4.86	173	0.9	5	-5.7	1.8	20.0	8.0	21.0	42.0	42,970
Rwanda	4.37	91	4.1	12	0.3	3.4	20.1	23.0	61.0	46.0	39,350
Samoa	0.15	350[a]	..	3	..	..	10.2	97.8	91.0	68.0	..
Somalia	3.35	170	1.9	8	0.8	0.4	15.2	50.0	40.0	43.0	..
Sudan	16.95	279	0.5	6	4.5	4.1	9.7	20.0	39.0	46.0	9,760
Uganda	12.35	259	-2.8	6	1.6	1.7	10.4	..	51.0	53.0	28,330
Tanzania	16.09	176	1.9	9	0.0	1.9	9.4	66.0	70.0	51.0	18,490
Upper Volta	6.39	74	-2.8	10	-0.9	1.9	18.0	..	16.0	42.0	61,800
Yemen Arab Rep.	5.52	270	3.9	5	5.2	1.5	17.1	13.0	26.0	47.0	18,770
Yemen Democratic	1.80	169	1.9	..	6.3	3.5	8.6	27.1	78.0	47.0	9,210

[a] 1976.
[b] Including mining.
[c] Trend rates.
[d] 1970-75.
[e] 1960-65.
[f] Estimated.
.. Not available.

Source: UNCTAD: TD/B/AC.17/14 18 January 1980.
World Bank: World Economic and Social Indicators.
World Bank: World Development Report, 1979.

Overseas Development Council, The United States and World Development Agenda, 1979.

Table 2

Least Developed Countries : Official Aid Flows

(US $ million)

	Bilateral				Multilateral
	DAC countries	OPEC	Socialist countries*	Total	Total
1970	387	Negl	90	477.0	178.0
1971	481	Negl	175	656.0	232.0
1972	786	Negl	215	1,001.0	289.2
1973	1,096	23.7	255	1,374.7	447.7
1974	1,393	321.8	170	1,884.8	571.0
1975	1,990	583.5	140	2,713.5	998.9
1976	1,492	637.7	165	2,294.7	867.1
1977	2,191	750.8	NA	2,941.9**	951.8

* Source : National Foreign Assessment Centre (CIA), Research Paper ER 78-10253, May 1978.

** Excluding resources from Socialist countries.

Table 3

Comparative summary of selected structural indicators of least developed countries and all developing countries

	Least developed countries	All developing countries
Agriculture		
Share in total GDP (%), 1976	44.5	18.2
Agricultural labour force as % of total force, 1977	83	61
Output per worker in agriculture ($), 1977	196	433
Cereals: yield per hectare as % of world average (1974-1976)	59	71
Per capita trade in food and agricultural raw materials (1975):		
Exports ($)	9.3	24.1 a
Imports ($)	7.1	14.6 a
Mining and fuels		
Share in total GDP (%), 1976	1.1	13.4
Per capita trade in ores and metals (1975)		
Exports ($)	1.0	6.9 a
Imports ($)	1.3	6.3 a
Per capita trade in fuels (1975):		
Exports ($)	1.1	11.4 a
Imports ($)	2.7	17.0 a
Per capita energy consumption in kilograms of coal equivalent (1975)	45	149
Manufacturing		
Share in total GDP (%), 1976	8.7	17.5
Per capita trade (1975):		
Exports ($)	1.7	18.0 a
Imports ($)	14.5	46.6 a
Investment		
Gross domestic investment per capita ($), 1977 b	22	86
Government		
Government consumption expenditure per capita ($), 1977 b	15	70
Transport and communications		
Passenger cars per 1,000 population 1976	1.7	11.9
Telephones per 1,000 population 1976	2.0	13.9
Education and literacy		
Primary enrolment ratio (%), 1975	49	76
Secondary enrolment ratio (%), 1975	13	19
Adult literacy rate (%), 1974	21	40
Health		
Physicians per 100,000 population, 1974	6.2	14.4
Infant mortality (per 1,000 live births), 1975	146	111

Source: UNCTAD secretariat estimates, based on data of the Statistical Office of the United Nations, World Bank, World Development Report 1978, Washington D.C., August, 1978, and other international sources.

a Excluding major petroleum exporters.

b At 1976 prices.

Table 4

Developing Countries : GDP Growth and Levels

	All developing countries	Least developed countries
Growth in total GDP (per cent per annum)		
1960-1970	5.3	3.1
1970-1977	5.8	3.2
Growth in per capita GDP (per cent per annum)		
1960-1970	2.8	0.8
1970-1977	3.2	0.7
1970-1980 target rate for DDII	3.5	
Level of GDP per capita ($)		
1977	505	139
1990*	732	152
Projected per capita increment ($)		
1977-1990*	227	13

* Projected at 1960-1977 GDP growth rates, and assuming a 2.5 per cent per annum population growth.

Table 5

Developing Countries :
Growth in Agricultural and Food Production and in Population

(per cent per annum)

	Agricultural production			Food production		Population
	1960-70	1970-77	1970-80 target	1960-70	1970-77	1970-77
All developing countries	2.7	2.6	4.0	3.0	2.7	2.5
Least developed countries	2.5	1.7	4.0	2.5	0.9	2.5

Table 6

Developing Countries : Domestic Investment

	Share in GDP (per cent)	Real annual average growth rate (per cent)	
	1976	1960-70	1970-77
All developing countries	17	6.6	9.5
Least developed countries	16	6.0	3.3

Table 7

Developing Countries : Import Volume and Export Purchasing Power

(constant 1977 dollars per capita)

	Average 1965-1968	1970	1977	1978
Import volume				
All developing countries*	63.7	76.0	93.0	97.8
Least developed countries	29.5	32.3	34.0	35.2
Export purchasing power				
All developing countries*	51.1	62.6	76.3	76.0
Least developed countries	22.7	23.7	19.1	17.5

* Excluding major petroleum exporters.

Table 8

Developing Countries : Commodity structure of exports, 1977

(percentages)

	All developing countries *	Least developed countries
Food	32.7	52.2
Agricultural raw materials	7.5	21.6
Fuels	15.9	6.1
Ores and metals	9.9	8.1
Manufactured goods	33.7	10.9
Unallocated	0.3	1.1
Total	100	100

* Excluding major petroleum exporters.

THE IMF's ROLE IN THE BALANCE OF PAYMENTS PROBLEMS OF NON-OIL DEVELOPING COUNTRIES

Economic Affairs Division
Commonwealth Secretariat

March 1980

The IMF's Role in the Balance of Payments Problems of Non-oil Developing Countries

CONTENTS

I. IMF Response and Financing Role

1. The IMF's response to developments in the balance of payments of 'non-oil developing countries'(1) after 1973-74 has been largely ad hoc in nature. Temporary 'oil facilities' were established in 1974 and 1975 under which the Fund borrowed and recycled some SDR 6.9 billion(2). An Extended Fund Facility (EFF) was also created in 1974 to assist countries to overcome structural balance of payments maladjustments and at the end of 1975 the Compensatory Financing Facility (CFF) was liberalised. Also, as part of the Jamaica package in early 1976, credit tranches were temporarily widened until the coming into force of quotas under the Sixth General Review in April 1978. In addition, a Trust Fund, which is administered by the Fund but is not a part of the Fund's regular resources, was created to provide highly concessional assistance to low-income countries for the period 1976-80 from the profits of sales of IMF gold. The Supplementary Financing Facility (SFF) (initially for two years) came into effect in February 1979 and permitted substantial additional access in conjunction with the use of the Fund's resources in credit tranches and/or extended arrangements. Also during 1979, the CFF was further liberalised to permit enlarged access. During the period since 1973-74, two quota reviews took place. Under the Sixth Review, overall Fund quotas increased from SDR 29 billion to SDR 39 billion while under the Seventh Review (likely to come into effect at the end of 1980) quotas will increase to about SDR 59 billion.

2. Thus, whereas at the end of 1973 the theoretical maximum access to the Fund by a country was 225 per cent of quotas, by the end of 1979 the figure had increased to 480 per cent. When considering quota increases (for non-oil developing countries from SDR 6.7 billion at end-1973 to SDR 8.8 billion at end-1979 and SDR 13 billion at end-1980), availability from the the Fund appears to have increased substantially (see Table 1).

3. Table 2 shows current account deficits and 'autonomous transactions deficits'(3) and gross and net drawings from the IMF during the three years prior to the first oil crisis and subsequently. In the three years 1971-73 cumulative IMF net drawings were SDR 0.4 billion, representing some 1 per cent and 13 percent respectively of current account and autonomous deficits. During 1974-76 cumulative current deficits almost tripled, while autonomous deficits rose ten times. Although net drawings from the IMF increased thirteen times, this support still represented a relatively small share - 6 per cent and 17 per cent respectively - of current and autonomous deficits. During 1977-79 the Fund made a negative contribution, with repurchases exceeding drawings by as much as SDR 0.7 billion(4).

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1. The definition of 'non-oil developing countries' used in this note is the one employed by the IMF in its International Financial Statistics prior to March 1980 when the definition was amended to include seven countries previously classified as more developed primary producing countries.
2. SDR 2.5 billion to 'non-oil developing countries'.
3. Those deficits for which countries had to look for finance - these were defined as current account deficits net of long-term official flows and direct foreign investment.
4. However, the Trust Fund has provided almost SDR 1.5 billion to low income countries since 1976. Also, SDR allocations of SDR 1.5 billion were made to non-oil developing countries in 1979.

4. Most of the IMF assistance provided in 1974 and 1975 came from the temporary 'oil facilities' and in 1976 from the liberalised CFF (Table 3). This in many cases was largely supplemented by the use of the reserve or the first credit tranches. That very little use was made of other facilities can be seen from the fact that out of 90 non-oil developing country members of the Fund, only three had higher tranche drawings and two extended facility drawings outstanding at the end of 1976 (Table 4). During 1977-79, given the limited availability of other facilities, it would have been reasonable to expect that facilities which were under-utilised before would be resorted to(1). Yet at the end of 1979 only 13 countries had outstanding drawings under higher tranches and seven under extended arrangements.

5. The constraints (all interdependent) on the use of the Fund's resources have time and again been spelt out by developing countries. On the facilities they have been reluctant to use, the problems are as follows: that the resources available from the Fund are small in relation to the size of their balance of payments problems and that conditionality attached to the use of these resources is harsh. Since the 1973-74 oil crisis, two other specific problems have emerged. First, given the nature of their balance of payments problems, adjustment is required to take place in too short a period of time; and secondly, sufficient attention is not paid towards promoting structural adjustment in developing countries so as to minimise disruptive effects on their development programmes. Sections II-IV below deal with some of these issues. Section V deals with the CFF, which countries have been willing to use and where quota ceilings rather than conditionality is the effective constraint.

6. A more fundamental issue concerns the asymmetry of the adjustment mechanism which imposes the entire burden of the adjustment on deficit countries. The question of the IMF's role with regard to surplus countries is considered in Section VI below. Now that the Brandt Commission has completed its work and published its report, Section VII summarises those of its main recommendations which are directly relevant to the subject matter of this note.

II. Size of Available Resources

7. Table 5 shows the relationship between the size of the non-oil developing countries' current account deficits and that of the total theoretical maximum drawings from the Fund, based on their quotas. The theoretical maximum drawings are not intended to infer that these amounts would actually be available to finance the deficits, given that the Fund's resources are of a revolving nature and that annual availability is governed by its operational policy considerations. Yet when compared over a period with current account deficits, they illustrate the Fund's reduced ability to provide support in relation to the size of the deficits. For example, whereas at the end of 1973 the theoretical maximum availability was such as to finance nearly nineteen months of '1973 annual deficits', by the end of 1976 it had been reduced to less than a year's '1976 deficits'. When maximum availability under low conditionality facilities - reserve tranche, first credit tranche and compensatory facilities - alone are considered in relation to the current deficit, they show a dramatic decline. At the end of 1973 they could have covered 70 per cent of the 1973 deficits; at the end of 1979 they could cover only 40 per cent of that year's deficits.

8. Despite this reduced ability to provide financial support, it has been argued that the Fund's assistance provides a seal of approval of the soundness of a country's policies which greatly facilitates access to resources from the private market and also official aid. However, difficulties in relying on the private market are well known; it cannot be considered a certain source of finance because capital market conditions are subject to large and rapid

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1. However, the Trust Fund has provided almost SDR 1.5 billion to low income countries since 1976. Also, SDR allocations of SDR 1.5 billion were made to non-oil developing countries in 1979.

changes(1) and because not all countries can be sure at any given time that they will have access to such markets (2). Indeed, commenting early in 1980 on the prospects ahead, the Managing Director of the Fund, Mr. Larosiere, admitted, "If we do not pursue imaginative solutions at the level of the monetary system itself, we shall fail individual countries which are making efforts to adjust, because resources will not be channelled to them in sufficient quantities and in realistic terms. The present financial system may need to be complemented by new arrangements".(3)

9. The question naturally arises as to what the Fund itself could do to ensure that countries do not face the difficulties raised by the Managing Director. The Executive Directors of the Fund can now relax or waive the present limits on the amounts available in circumstances where financing needs are large in relation to quotas. Evidence in recent months seems to suggest that the Fund has already been moving in this direction. However, greater use can be made of this procedure, particularly when even with the SFF such limits would not be appropriate.

10. One possibility for increased access to the Fund is the reactivation of the 'oil facility' as a permanent facility to deal with recurring oil crises. Another possibility is substantial additional contributions to the SFF by the principal surplus countries and making the facility permanent following the two-year initial period. However, given that the use of the SFF is largely linked to high conditionality facilities, it remains doubtful whether it could be of immediate use. Also, both the 'oil facility' and the SFF are dependent on voluntary contributions and thus on the willingness of lenders to contribute to them. One wide-ranging proposal - the establishment of a medium-term facility - concerns the raising of resources in the capital markets along the lines followed by the World Bank.(4) A further possibility suggested by the Brandt Commission is that the IMF could expand its resources by borrowing in the markets, using its gold (amounting to 100 million ounces) as collateral.

11. The above approach is based on the establishment of special facilities with separate funding arrangements. The Fund has concentrated on this approach because of the limits on its regular resources which are based on the overall size of its quotas. Over the next few years, an important

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1. The very high present level of private international credit to developing countries is a result of an excess supply of funds. Should this supply fall or demand for industrialised country borrowers increase, then developing countries and, particularly, marginal borrowers may be squeezed out of the market.
2. Seven countries accounted for 70 per cent of the total net debt of non-oil developing countries to multinational banks at the end of 1977.
3. Managing Director's address to African Centre for Monetary Studies, reproduced in IMF Survey, 21 January 1980.
4. UNCTAD/UNDP Project INT/75/105, Balance of Payments Adjustment Process in Developing Countries, Report to the Group of Twenty-four. Several other proposals on recycling have also been made. These are surveyed in UNDP/UNCTAD Project INT/75/015, A Survey of some Recent Proposals for New International Facilities, Report to the Group of of Twenty-four.

question that needs attention concerns the optimum size of the Fund, and thus of its regular resources. Compared to the early 1950s and the early 1960s, the size of quotas in relation to world imports has been reduced by half. Also attention needs to be focused on the way individual country quotas are determined. Non-oil developing country quotas are relatively small compared with the overall size of the Fund, and this is largely a result of the criteria chosen to determine individual country quotas.

III. Conditionality

12. IMF conditionality attached to its balance of payments assistance is linked to the adoption by countries of what the Fund calls "adjustment policies" which are expected to lead rapidly towards restoring balance of payments equilibrium. Details of conditionality under the various facilities of the Fund are shown in Table 1. Much of the discussion of Fund conditionality relates to the higher credit tranches and the extended facility.

13. The main criticism of conditionality relate to the content of the programme, which is sometimes inconsistent with the cause and nature of the country's particular problems. A recent UNCTAD/UNDP study (1) has provided an elaborate critique on Fund conditionality. These criticisms relate to the diagnosis of the sources of balance of payments difficulties, targets set for the programme and instruments used to achieve the targets. As for diagnosis, the Fund has become a leading exponent of the "monetary approach" to solving balance of payments difficulties(2), although it is aware of the many legitimate questions that may be raised concerning the methodology employed and has suggested that the "monetary approach" needs blending with other lines of analysis.(3) Also, the question arises whether performance criteria, such as ceilings on domestic credit expansion, that lend themselves to automatic application without further judgement, can in fact provide a valid test of economic performance. Furthermore, these performance criteria determine the character of the adjustment to be undertaken and usually imply global fiscal/monetary restraint regardless of the source of balance of payments difficulties.

14. In particular the UNCTAD/UNDP study points out that the diagnosis should be capable of distinguishing between those situations of excess demand where deflationary policies have a central role and others that do not lend themselves to treatment by generalised deflation. Thus, in situations characterised by cost and price spirals, as the Fund has already recognised by the creation of the EFF, normal application of deflationary measures would be disruptive and would create a conflict between the objectives of external

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1. UNCTAD/UNDP Project, op. cit.
2. Some of the concepts and basic models employed have been analysed in a collection of essays published by the Fund under the title The Monetary Approach to Balance of Payments, as well as in the Fund's voluminous Staff Papers.
3. Carl P. Blackwell, Reflections on the Monetary Approach to Balance of Payments, IMF Survey, 20 February and 6 March 1978.

balance and domestic development. Similarly, deficits that are the counterpart of the structural surpluses in surplus countries would not be capable of reduction by generalised deflationary policies in deficit countries. On this issue, the Brandt Commission's Report notes that "in many cases these /deflationary/ measures reduce domestic consumption without improving investment; productive capacity sometimes falls even more sharply than consumption. This is because many developing countries with deficits have a shortage of food or of basic consumer goods or cannot readily shift resources in line with their new needs. Indeed, the Fund's insistence on drastic measures, often within the time framework of only one year, has tended to impose unnecessary and unacceptable political burdens on the poorest, on occasion leading to 'IMF riots' and even the downfall of governments".(1)

15. The UNCTAD/UNDP study has suggested that the Fund should consider all the alternative policy approaches so as to reduce the cost of adjustment. In this connection it points out that restrictions on trade and exchange - either applied exclusively or combined with reductions in aggregate demand - are rarely accepted by the Fund, because of its commitment to the liberalisation of trade. With the new wave of protectionism that has spread among the industrialised countries this commitment has less relevance, particularly when it could be demonstrated that adoption of such policies could reduce the cost of balance of payments adjustment to the national economies. Also, alternative policy approaches should take into consideration their effect on income distribution. In the past, Fund adjustment policies have often had a negative effect on income distribution. It has been suggested that a new criterion might be added to the performance targets of IMF standby arrangements, in that income distribution should be required at least not to deteriorate.(2)

16. Recently, a new set of conditionality guidelines has been issued by the Fund with the express requirement that it should pay due regard to the domestic, social and political objectives and the economic priorities and circumstances of members. According to the Fund's Managing Director, this means that the Fund would now consider all the policy approaches available to a country in support of its adjustment needs and take account of the member's social and political constraints in agreeing to a programme; but it does not mean that the Fund's resources would be available in the event of reduced adjustment efforts which failed to address adequately a member's problems. Whether the recent changes would amount to a basic change in the Fund's operational policies is not yet known.

IV. Period of Adjustment

17. It can easily be agreed that a desirable rate of adjustment is one that minimizes the cost of output and growth potential forgone, including frictional costs of adjustment. The country studies, carried out as part of

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1. North-South: A Programme for Survival , page 216.
2. See Stephany Griffith Jones, International Monetary and Financial Issues and Developing Countries, with particular reference to UNCTAD V, forthcoming issue of the IDS Bulletin.

the UNCTAD/UNDP project referred to earlier, have shown that in the post-1973 period the costs of adjustment could have been substantially reduced if members had had access to larger external sources of financing over a longer period and on appropriate terms. The need for a longer adjustment period is particularly desirable where an economy suffers structural maladjustments. This was already recognised by the Fund in the two types of situation qualifying for extended facility financing: first, where the economy had suffered from serious imbalances over a number of years and cost and price distortions had become widespread, and secondly where countries had inherently weak balance of payments position (resulting from a very narrow productive base and high dependence on a few export commodities). It was recognised that while the latter situation called for long-term development assistance such as from the World Bank, there was also room for support from the Fund.

18. The 1973-74 oil crisis also created structural surpluses that could not be reduced by the actions of deficit countries alone. The rate of adjustment by these countries, whether or not they are suffering from structural maladjustments, is dependent on the rate of adjustment by surplus countries. Few can doubt that in the medium to long-term, oil prices will rise in real terms, and this is going to constitute a continuing problem for non-oil developing countries. The implications for these countries is a continuing need for finance over a relatively long period.

19. The Fund's awareness of the problem can be seen in the possibilities that now exist for standby/extended arrangements for up to three years. The IMF staff consider thare are practical difficulties in formulating adequate programmes for longer than three-year periods because of the greater risk of unforseen or exogenous factors rendering the programmes ineffective, although in appropriate circumstances, they suggest, an EFF programme could be followed by a two-year standby or a new EFF programme, thus providing financing over a five or six-year period. The essential point is that while continuing consultations with the Fund and revisions of annual programmes as and when necessary within a long-term framework would inevitably be among the critical elements in the operation of the EFF, a reasonable degree of assurance of continuing availability of finance on appropriate terms and for longer periods is crucial for the objectives which the EFF is intended to serve.(1) Indeed the principal aim of the medium-term facility proposed by UNCTAD is to provide support for periods of five to ten years on terms and conditions adjusted to the circumstances of borrowing countries and with interest subsidies for the poorest of them.

V. Compensation for Export Shortfalls

20. A more direct and immediate contribution to meeting the financing needs of balance of payments can be made by providing more adequate compensation for export shortfalls under the CFF. Recent liberalisation has raised ceilings on drawings to 100 per cent and enlarged coverage by the possibility of including some services in the calculation of shortfalls. Since June 1978,

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1. In this connection, since the SFF is at present to be used in tandem with the EFF, making the SFF permanent and extending its repayment period to ten years is important if these objectives are to be realised.

CFF assistance has been supplemented in appropriate cases by the EFF or a standby arrangement or by programme loans from the World Bank group.

21. The important question in relation to the CFF is whether it should be modified to permit financing medium-term shortfalls. The apparent reluctance to incorporate these in the facility seems largely to be based on the view that shortfalls lasting several consecutive years, even if caused by forces beyond the control of the authorities, must be corrected through adjustment and that a high degree of conditionality should therefore be required. This raised an important question about the Fund's financing role. There are cases where shortfalls in exports could persist for more than two years because of temporary setbacks in demand (due, say, to cyclical recession in industrial countries). In such cases it may be desirable to finance the resultant deficits rather than adjust public spending targets or development plans and programmes. If this view is accepted, the technical difficulties of determining the amounts required for medium-term shortfalls could no doubt be overcome.(1)

22. At UNCTAD V, proposals were made by Sweden, Germany and the Group of 77 for establishing a financing facility complementary to the CFF which would provide additional compensation for commodity shortfalls after taking into account the amounts drawn under the CFF and STABEX. The Secretary-General of UNCTAD was requested to prepare a detailed study in consultation with the IMF, for the operation of such a facility.(2) Estimates by the Bank/Fund staff have shown that such compensation would have been necessary during 1963-73 and between 1976-78 if a complementary facility had been in operation at the time. Although a majority of the IMF Executive Board have not yet accepted the need for such a facility, the proposals deserve to be kept under review because a complementary facility, if established, would provide an additional mechanism available to developing countries in temporary difficulties and would strengthen the Fund's role in meeting these difficulties.

23. A more fundamental question concerns the role of compensatory finance which has to date been a supplementary form of adjustment assistance and bridging finance.(3) What compensatory financing can stabilise in a developing economy is "import capacity"(4) rather than export earnings.

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1. For example, medium-term shortfalls could be compensated on the basis of three-year agreed targets for export earnings. This idea has been suggested in the past and is a variant of the old proposals for supplementary finance (not to be confused with the facility of the same name now in operation).
2. UNCTAD Resolution 125(v).
3. STABEX has a somewhat more developmental orientation but is too small to have a major macro-developmental impact even for most ACP members.
4. If the sustaining of import capacity was the principal objective of compensatory finance, the question of adjustment to oil prices would not pose a serious problem for most countries.

VI. Asymmetry of International Adjustment and IMF Surveillance

24. One of the basic issues concerning the problem of payments imbalances has been the asymmetry of international adjustment which leaves the entire burden of adjustment on the deficit countries. Although a fairly drastic remedy for persistent surpluses is provided in the IMF Articles of Agreement, in the form of a scarce currency clause involving discriminatory exchange and import restrictions against any scarce currency countries, the remedy has never been invoked for that very reason. This being the case, surplus countries have been under relatively little pressure to change the situation. Recently, the IMF's Articles have been amended to provide for surveillance over every member country's efforts to foster orderly underlying economic and financial conditions. This, at least in theory, provides valuable IMF leverage for promoting sound adjustment policies by all countries surplus or deficit, whether or not they draw on IMF resources. In practice, the IMF has little leverage to impose policies on surplus countries. These are not dependent on its funds; on the contrary, the IMF relies heavily on their financial support and they have important voting rights with the Fund. Since the main burden falls on deficit countries, this introduces a deflationary bias in the world as a whole and in particular within those countries that need Fund assistance.

VII. Brandt Commission's Recommendations

25. The Brandt Commission has devoted considerable attention to the role of the IMF in the adjustment process. Its main recommendations (pages 219-220) which have direct relevance to the subject under review are summarised below:

- There should be agreement on an adjustment process which will not increase contractionist pressures in the world economy. Surplus countries should accept greater responsibility for payments adjustments, and IMF measures to encourage this should be considered.

- The adjustment process of developing countries should be placed in the context of maintaining long-term economic and social development. The IMF should avoid inappropriate or excessive regulation of their economies, and should not impose highly deflationary measures as standard adjustment policy.

- The IMF should also improve and greatly extend the scope of its compensatory financing facility, for example, by relaxing quota limits, measuring shortfalls in real terms and making repayment terms more flexible.

- New SDRs should be created to the extent called for by the need for non-inflationary increases in world liquidity. The distribution of such unconditional liquidity should favour the developing countries which presently bear high adjustment burdens. Such a distribution - often referred to as an SDR link - would also assist the adjustment process of the international monetary system.

- In furthering the demonetization of gold, the bulk of the IMF gold stock should, after completion of the present sales arrangements, be used as collateral against which the IMF could borrow from the market for onward lending, particularly to middle-income developing countries. Staggered sales should also be undertaken and the accruing profits of such sales should be used as interest subsidy on loans to low-income developing countries.

Table 1

Financial Facilities of the Fund, their Conditionality and Possible Cumulative Purchases

(per cent of quotas, end of 1979)

	Possible cumulative purchases	
	Tranche policy	Extended Facility
Tranche Policies		
Reserve tranche	25	25
Condition - balance of payments need.		
First credit tranche	25	25
Programme representing reasonable efforts to overcome balance of payments difficulties; performance criteria and instalments not used.		
Higher credit tranches	75[a]	-
Programme giving substantial justification of member's efforts to overcome balance of payments difficulties; resources normally provided in the form of stand-by arrangements which include performance criteria and drawings in instalments.		
Extended facility	-	140
Medium-term programme for up to three years to overcome structural balance of payments maladjustments; detailed statement of policies and measures for first and subsequent 12 month periods; resources provided in the form of extended arrangements which include performance criteria and drawings in instalments.		
Supplementary financing facility	102.5[b]	140
To be used in support of programme under stand-by arrangements reaching into the upper credit tranche or beyond, or under extended arrangements, subject to relevant policies on conditionality, phasing, and performance criteria.		
Compensatory financing facility	100	100
Existence of temporary export shortfall for reasons beyond the member's control; member cooperates with Fund in an effort to find appropriate solutions for any balance of payments difficulties.		
Buffer stock financing facility	50	50
Existence of an international buffer stock accepted as suitable by Fund; member expected to cooperate with Fund as in the case of compensatory financing.		
Cumulative total [c]	377.5	480

a This limit may be waived by a decision of the Executive Board.

b In special circumstances a stand-by arrangement may be approved for purchase beyond these limits and the normal limitations under tranche policy; in such cases purchases will be made with supplementary financing. The amount of such additional finance will be quantified in relation to a member's need and the adequacy of its programme.

c In addition, some members have used 'oil facility' drawings. The average use by these members was equal to 75 per cent of quota.

Source: IMF.

Table 2

Non-oil Developing Countries:
Current Account Deficits and IMF Drawings
(S DR billion a)

Year	Current account deficit b	Deficit/Surplus b net of long-term official flows and private direct investment	Gross drawings from IMF	Net drawings from IMF
1971	-11.4	- 3.6	0.4	0.1
1972	- 8.5	- 0.5	0.8	0.4
1973	- 9.5	1.4	0.3	-0.1
1974	-25.4	-10.5	1.7	1.3
1975	-31.5	-13.3	2.0	1.5
1976	-22.1	- 4.8	2.7	2.0
1977	-18.0	1.5	0.7	-0.3
1978	-25.5	- 4.7	1.0	-0.7
1979	-32.3	- 6.6	1.4	0.3

a $ equivalent of 1 SDR: $1.20248 for 1974, $1.21415 for 1975, $1.15452 for 1976, $1.16752 for 1977, $1.25200 for 1978 and $1.29200 for 1979.

b Deficit (-) Surplus (+).

Source: Commonwealth Secretariat, based on IMF data.

Table 3

Non-oil Developing Countries: IMF Drawings by Facility
(SDR million)

	1974	1975	1976	1977	1978	1979
GROSS DRAWINGS	1,700.7	1,958.9	2,749.0	725.0	1,029.2	1,390.4
Tranche a	829.0c	526.0c	705.1c	352.4	414.5	616.0
Compensatory Financing	107.2	150.8	1,453.8	163.8	404.4	392.2
Extended Facility	-	7.7	90.0	208.8	174.0	131.5
Buffer Stock	-	-	-	-	36.1	13.9
Oil Facility	764.5	1,274.4	500.1	-177.8	-612.5	-
Supplementary Facility	-	-	-	-	-	236.9
TOTAL REPAYMENTS	412.0	429.1	769.0	984.3	1,721.7	1,138.3
NET DRAWINGS b	1,288.7	1,529.8	1,980.0	-259.2	-692.7	252.1
Credit Tranche	264.1	81.7	56.5	-50.2	-163.1	243.6
Compensatory Financing	75.2	95.6	1,140.5	-22.9	66.6	4.8
Oil Facility	764.5	1,274.4	500.1	-177.8	-612.5	-397.7
Extended Facility	-	7.7	90.0	170.0	71.6	131.6
Supplementary Facility	-	-	-	-	-	236.9
MEMORANDUM ITEM						
Trust Fund Loans	-	-	-	150.4	690.6	526.6

a Comprising: Reserve Tranche and Credit Tranche.

b Net Drawings also include Reserve Tranche and Buffer Stock Facility.

c Tranche Drawings for 1974 to 1976 reached by substracting other drawings from Gross Drawings.

Source: Commonwealth Secretariat, based on IMF International Financial Statistics.

Table 4

Number of Non-oil Developing Countries with Drawings Outstanding in the IMF Facilities

(at end of year)

End of year	Number of members	Number of members having drawings outstanding under					
		Reserve Tranche	First Credit Tranche	Higher Credit Tranche	Extended Facility	Oil Facility	Compensatory Facility
1975	85	60	24	5	1	38	17
1976	90	67	28	3	2	44	40
1977	93	69	28	6	3	42	47
1978	99	89	28	12	4	37	45
1979	101	87	36	13 a	7 a	37	48

a Of these, some countries also had drawings outstanding under the Supplementary Financing Facility, two under Credit Tranches and three under the Extended Facility.

Source: Commonwealth Secretariat, based on IMF International Financial Statistics.

Table 5

Non-oil Developing Countries: Current Account Deficits and Theoretical Maximum Availability from the IMF

(SDR billion)

End of year	Current Account Deficits	Quotas	Total Theoretical Maximum Availability a	Theoretical Maximum Availability with Low Conditionality Facilities b
1973	9.5	6.7	15.0	6.7
1976	22.3	6.7	21.6	9.1
1979	32.3	8.8	42.1	13.1

a Maximum possible cumulative drawings that could be outstanding under all IMF facilities at the end of each year.

b Maximum possible cumulative drawings that could be outstanding under reserve tranche, first credit tranche and compensatory financing facility.

Source: Commonwealth Secretariat, based on IMF data.

PROTECTIONISM AND ADJUSTMENT POLICIES IN THE OECD

Paper prepared for the Commonwealth Secretariat by Jeremy Clarke, Research Officer, Overseas Development Institute, London.

The author thanks Dr. V. Cable for reading and commenting upon earlier drafts of this paper.

March 1980

Protectionism and Adjustment Policies in the OECD

CONTENTS

Part I : Introduction

1. Before 1973 there was an almost uninterrupted trend towards greater liberalisation of international trade, following the various rounds of GATT negotiations which led to a systematic reduction in the use of quantitative controls and tariffs to restrict trade flows. Deteriorating economic conditions in most Western countries since then have, however, led to increasing pressures to introduce selective import restrictions, in order to safeguard jobs and profits in particular industries (over and above the restrictions which have long applied to agricultural trade). Under existing GATT arrangements Article XIX provides the only basis for official trade restrictions. It allows for 'emergency safeguard measures' to be taken by importing countries when a domestic industry becomes subject to 'rapid' and 'damaging' import increases. The EEC and some other developed countries (DCs) have, however, been hesistant to apply this rule, believing that under the Article compensation would have to be paid to injured exporters and that the Article could only be invoked on a non-discriminatory basis. The response to this has been the emergence of the so-called 'new protectionism', which has brought a proliferation of non-tariff barriers operating outside the GATT rules. These have been increasingly adopted by OECD countries, in order to control imports and to protect a declining domestic industry from growing international competition. Products from newly industrialising countries have been particularly affected. The measures include quotas, countervailing and anti-dumping duties, minimum pricing, and direct government subsidy of domestic industries declining in the face of imports. Bilateral Voluntary Export Restraints (VERs) have also been extensively used. Under these, a producing country undertakes to limit its exports to the consuming country.

2. Internationally agreed protectionist devices have also been used increasingly. These include 'Orderly Marketing Arrangements' (OMAs), which define growth rates for the imports of each consumer, and for the exports of each supplier, and are usually regarded as agreements with formal government involvement. Trade in textiles and clothing has been subject to official regulation for several years under the GATT Multi-Fibre Arrangement.

3. International organisations are deeply worried about the growth of the new protectionism. The International Monetary Fund (IMF) has observed that :

> 'the widening application by many developed countries of the various forms of import restraint .... is a matter for serious concern'.

It has also drawn attention to the fact that :

> 'the rise in protectionism has had a deleterious effect on the efforts of those LDCs seeking to enhance economic growth through outward looking economic policies.'

The effects of increased protectionism were also discussed at UNCTAD V :

> 'the most prominent feature of the new protectionism is its rapid growth in the past ten years ... from 1975-1977 import restrictions introduced or seriously threatened by developed market economies have affected between 3 per cent and 5 per cent or roughly from $ 30-50 billion of international trade.'

Recent Trends in Protectionism

4. The monitoring of protectionism has been attempted in two recent studies by Riedel (1)* (1979) and Page (2) (1979). Riedel attempted to provide a detailed account of the changes in official trade barriers (3) in the EEC, Japan and the USA during 1973-1978. There are several approaches that can be used to assess quantitatively the impact of changes in trade barriers. Riedel uses the simplest, which is merely to measure the flow of trade in products subject to changing trade barriers. The major shortcoming of this is that it only provides a measure of trade flows subject to official barriers. And in all probability these are relatively insignificant. His estimates indicate that the total imports of goods into the EEC and the USA receiving safeguard protection constitute only small shares of total manufactured imports into those markets. The share of protected products as a percentage of total imports of manufactures from LDCs is also low, exceeding 3 per cent in only four cases excluding textiles and clothing. Much more interesting is his inventory of individual country action which has been used to construct Table 1. This led Riedel to the more serious conclusion that his quantitative measure merely indicated a shift from 'official' protectionist measures to the use of VERs or the direct subsidy of domestic industry by the DCs. On this question Riedel is clear :

> 'Defensive subsidisation of industry in Europe is on the rise. Unofficial, secretive agreements between governments and industries to restrict trade are by all reports proliferating ..... Whatever the present level of industrial protectionism an upward trend is all too clear.'

5. Page (1979) has attempted to measure how much of world trade is 'managed' or 'controlled' in some way other than by tariffs. Unfortunately her definition of controlled trade is wide reaching and includes trade controls by both exporters and importers, internationally agreed OMAs and commodity agreements, which makes it much less useful as a measure of protection. Her method was to take the 1974 trade figures and to use them to weight the controlled sectors under the restrictions in force at the end of 1974 and those in force now (1979). Between 40-50 per cent of world trade is shown to be directly controlled and the proportion has risen by almost a sixth in the last few years. For the OECD as a whole Page noted that 33.6 per cent of total imports were 'managed' (under 1974 restrictions) whereas 39.2 per cent of total imports in 1977 would have been defined as 'managed' under the restrictions in force in 1979. Imports from the non-oil developing countries were much more heavily 'managed', reaching 54.17 per cent in 1974 under 1974 restrictions and rising to 65.5 per cent in 1977 under the restrictions in force in 1979. There are, however, as has been pointed out, methodological drawbacks to this approach.

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* References designated by bracketed figures are given on pages 78 - 80.

6. In order to supplement these studies a simple inventory operation has been carried out in Table 1. It seeks to outline the type of restrictions imposed by different countries for particular products. The table generally confirms Riedel's finding that there has been an upward trend in protectionism in recent years. It indicates that the EEC has relied on unilateral quantitative restrictions (QRs) rather than on OMAs or tariffs, and that the latter have been favoured by the USA. The extent and variety of OECD trade restrictions is clear. The most seriously affected products are comparatively few, but important : textiles, shoes, motor vehicles, steel, transport equipment (especially ships), and certain sectors of light engineering, particularly electrical goods and electronic components such as TV sets, radios and calculators. Two of the most protectionist countries would seem to be the USA and the UK. For EEC countries, however, including Britain, the measures have been subsumed in Community-wide actions, and it is difficult to say whether on particular issues it has been the UK or other member states (mainly France) which has been the decisive restrictive influence.

The Multi-Fibre Arrangement

7. The MFA was the outcome of negotiations instituted by GATT in 1973, in order to establish mutually satisfactory arrangements for the organisation of world trade and production of textiles. In common with the Long Term Arrangement for cotton textiles (LTA) which preceded it, the MFA was supposed to be a temporary measure whilst structural adjustment in the DC industries took place. The aim of the MFA was to expand trade in textiles in an orderly way by allowing an annual increase of 6 per cent in LDC exports to DCs, which it was hoped would not be too disruptive to DC markets. The MFA was drawn up within the framework of GATT so that all parties to the agreement had to maintain the principles and obligations of GATT. Implementation was through a series of bilateral agreements on quantitative restrictions, which were completed in 1975 by the USA and 17 supplying countries but not until 1977 by the EEC. The delay by the latter was due to the increasing pressure from domestic producers concerning 'low cost' imports from LDCs which emerged due to the recession and the resultant contraction of the EEC textile market. The EEC took a hard negotiating line, particularly in relation to 'sensitive products', which were defined in terms of the degree of import penetration of the domestic market for any given sub-product. The outcome in late 1977 was bilateral agreements with twenty-three supplying countries, arrangements to curb imports from six countries with which the EEC had preferential agreements, and unilateral restrictions on Taiwan and several state trading countries.

8. The EEC's bilateral agreements were renewed for a further four years in 1978, in a manner which was more restrictive, less flexible and more detailed than before. In order to accommodate these changes, the original GATT formulation of the MFA was amended to include important changes such as "the possibility of jointly agreed departures from particular elements" of the MFA in certain cases.

9. In reality the continued existence of the MFA represents the more or less permanent institution of 'organised free trade' in textiles and clothing. Eighteen years after the first temporary organisation of trade under the LTA almost all DCs have restraints of one kind or another on imports of textiles

and clothing. Moreover, as we shall see, the structural adjustment policies of the DCs toward their domestic industries have been less concerned with moving resources out of these industries than with committing more resources in an effort to increase productivity, whilst sheltering from LDC competition behind the protection of the MFA.

Multilateral Trade Negotiations

10. The recent completion of the 'Tokyo round' negotiations (begun in 1973) has important implications for protectionism in the OECD. First, although tariffs are no longer the most important issue in trade negotiations, tariff reductions of 33 per cent for all industrial products and 26 per cent for the industrial products of LDCs have been agreed. This excludes textiles, of course, since all textile exports are quota controlled, so that tariff cuts will only have a minimum effect in stimulating trade in this area. Moreover, the overall effects of the tariff cuts, which are higher on LDCs' exports of raw materials and semi-manufactures than on the finished goods, may be to increase effective tariff protection in DCs on final stage processing. Second, LDCs will suffer from the erosion of their preference margins both under the Generalised System of Preferences and under particular arrangements such as the EEC's Lome Convention.(4)

11. A more significant issue for the LDCs has been the negotiations over the use of emergency safeguard measures (Article XIX of GATT) which, as we observed (see para 1) the EEC and other DCs found difficult to use. Major disagreements emerged, notably between the EEC and the LDCs over the selective use of safeguards, and particularly over the question whether greater selectivity would make protectionist actions more or less frequent. Disagreements have also emerged between the EEC on the one hand and the USA and GATT on the other, over the possible terms of the safeguards code. Negotiations on the code so far have failed. The EEC has, however, since made it clear that it will not be deterred from using Article XIX selectively if necessary, as it did in the recent case of Korean TV imports into the UK. One major potential source of benefit to LDCs from the Tokyo Round would be a successful implementation of the non-tariff codes which would allow improved market access for LDCs' exports in return for limited reciprocity. At the time of writing, however, the Tokyo Round negotiations have failed to satisfy the LDCs and almost all of them have refused to initial the final agreement.

Part II : Impact of Trade with LDCs on Western Economies

Sources of structural change (5)

12. It is apparent that structural change, or the process of adjustment in the industrial structure of the OECD economies has had several causes, including the changing structure of domestic demand, technical progress, and the trade experience of particular manufacturing sectors. This has been highlighted by a group of studies (6) using a 'growth accounting' framework. These studies seek to quantify the economic impact on advanced country employment levels of changes in domestic demand, productivity and trade flows in particular industrial sectors.

13. In the case of the UK, a Foreign and Commonwealth Office Report (7) attempted to quantify the effect on employment of increased imports into the UK from LDCs during 1970-1975 for four main product groups: footwear, leather

and leather products, textiles and clothing, using the methodology developed by Cable (1977).(8) The changes in employment in these sectors during 1970-1975 are attributed to changes in productivity (measured by output per man in real terms); changes in home demand (output plus imports, less exports in real terms) and changes in net import penetration from all countries, and with LDCs (see Table 2).

14. Estimates are derived from the model outlined in footnote (8) and, taking all four industries together, increased productivity emerges as the most important job displacement factor - more than twice as important as the increase in net import penetration. In each individual case increased imports from the LDCs emerged as the least important cause of employment losses during the 1970-1975 period. The effect of increased imports from the LDCs was highest in the textile and clothing sectors, where they accounted for 19 per cent of identified job losses, and in the leather industry where the figure was 10 per cent (see Table 3). Cable (1977) estimated that the annual direct loss of jobs due to net trade with the LDCs as a percentage of sectoral employment was of the order of 1 per cent in clothing (the worst case), 0.8 per cent for cotton textile fabrics, 0.4 per cent for footwear, and negligible for textile yarn. It was however, recognised that the calculations were based on restrictive and static assumptions, and that there must inevitably be room for argument over interpretation of the results.

15. A similar, though more dated study has been conducted for the USA by C. Frank(6) (1977) on the effects of foreign trade on employment in the USA between 1963 and 1971. The study concentrated upon 207 'import competing' industries which accounted for 46 per cent of total manufacturing output and 40 per cent of US employment in 1971. The change in employment is divided into two categories : increases in employment potential due to the expansion of domestic demand and exports; and declines due to increased imports and labour productivity.(9) Changes in labour productivity and domestic demand are shown to be the most important factors affecting employment growth, and the loss of job potential due to increased labour productivity was six to nine times as great as the loss due to net foreign trade (imports less exports) between 1963 and 1971. Nonetheless, the import competing industries lost a total job potential of 600,000 jobs, due to increased imports during this period. The net effect, however, after accounting for increased employment was 350,000 (or over this period as a whole 1.2 per cent of total manufacturing employment in the USA). The study then attempts to estimate job losses caused by imports from LDCs. The total loss of job potential due to increased imports from LDCs was estimated to be nearly 300,000 which amounts to 42,000 jobs per year. It should, however, be underlined that this figure takes no account of job expansion brought about by increased USA exports.

16. F. Wolter(6) (1977) has carried out an analysis of job displacement and import penetration for the Federal Republic of Germany, based on past job displacement during the period 1962-1975 and projected displacement up to 1985. For all manufacturing industries combined, the direct labour displacement during 1962-1975 is estimated to be 132,800 from the growth of imports from the LDCs, 1,684,400 due to growth of imports from all sources, and 6,531,100 due to changes in labour productivity. The projections indicate that in overall terms the cumulative net displacement due to intensified trade with LDCs from 1973 to 1985 was 450,000, which was greater than in the past, but below the annual displacement due to productivity growth which was on average 500,000 per year.

17. These studies indicate that the total employment impact of imports of manufactures from LDCs is very modest in relation to other factors. Even in those industries most markedly affected, imports from LDCs are responsible for significantly less of the job losses concerned than lobbyists claim, and are in fact often less important as an immediate causal factor than productivity growth or trade with developed countries. These studies are, of course, retrospective and do not tell us what could happen under greater or lesser degrees of liberalisation.

Input/Output studies (10)

18. A second major group of studies (11) are those which quantify the total (i.e. direct and indirect) employment effects of an increase in trade flows. These include studies by de Grauwe et al (1977) on Belgium, Grinols and Thorbecke (1978) on USA, Kol and Mennes (1978) on Holland and Schumacher (1977) on Germany. All adopt a similar approach by assuming a given increase (i.e. a balanced expansion)* of trade. The direct and indirect employment effects of this expansion can then be estimated, using sectoral labour coefficients from the input/output table. The results of these studies, together with further methodological details are summarised in Table 4. As the table shows, the input/output analyses of Belgium, Germany and Holland lead to similar conclusions, namely, that the expansion of trade with LDCs involves only small net job losses.

19. There are, however, important differences in the estimates of the ratio of labour requirements to output in a balanced trade expansion with the LDCs. These range from Balassa's (12) (1979) recent estimate of 0.65 for direct labour requirements in the OECD and for the ratio of total labour requirements in the USA (Grinols and Thorbecke 1978) to 0.84 for total labour requirements** in Belgium (de Grauwe et al), 0.93 in the Netherlands (Kol and Mennes) and 0.96 in Germany (Schumacher). This constitutes a significant difference between the US and European studies because if Balassa and Grinols and Thorbecke are right about the ratio of labour coefficients, then the employment impact will become significantly negative if trade in manufactures with developing countries balances (see description of Balassa's work below).

20. Another important area of research has been the work of Baldwin(13) (1976) and (1979), and Baldwin and Lewis(13)(1976), which has concentrated upon an examination of the net trade and employment effects on US industry of multilateral tariff cuts. In these studies Baldwin assigned import and export demand elasticities to each tradeable sector in the US input/output table. Changes in exports for each tariff line item within a particular sector were then calculated and summed, to give the net change in final demand (i.e. the change in exports minus imports for each sector). (14) These changes were then pre-multiplied by the inverse of the matrix of production coefficients in the input/output table to obtain output change by industry. Lastly changes in employment were determined by multiplying these output changes in each sector by the appropriate industry labour coefficients. (15) Baldwin estimates that an across-the-board tariff cut

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* An equal increase in the value of imports and exports.

** These figures represent the ratio of the number of jobs required for a unit increase in the value of exports to the number of jobs lost due to a unit increase in the value of imports from the LDCs.

of 50 per cent (measuring both direct and indirect employment effects) would lead to a total labour displacement of 151,200 (148,200 of these in manufacturing). This would however be mostly offset by exports which would increase total employment by 136,000. The net change in employment was a decline of 15,200 jobs in all industries (31,700 lost in the manufacturing sector). Baldwin and Lewis conclude (page 148) :

> 'Not only are aggregate economic effects of a significant tariff-cutting exercise small, but the effects on individual industries, on various occupational groups and on employment in different states are minimal in most cases'.

21. In a recent and important study Balassa (1979) has attempted to calculate the employment effects in the developed countries (OECD, USA, EEC and Japan) of a balanced trade expansion with the developing countries on the basis of 1976 trade flows. He used a 184 commodity category breakdown of the US manufacturing sector and labour-input coefficients were taken from the US Census of Manufacturing for 1975. The US labour coefficients were also used for other developed countries as well. Assuming an unchanged composition of exports and imports he used comparisons of average labour-input coefficients* for exports and for goods competing with imports as an indication of the employment effects of a balanced trade expansion. For the OECD as a whole the average number of jobs for $1 million of output is found to be 18.4 for exports to and 28.5 for imports from LDCs; the ratio of the two being 0.65. According to Balassa this result conflicts with the view of the studies cited above which suggest that a balanced expansion of trade between DCs and LDCs has negligible net employment effects. This comparison suggests that a balanced expansion of trade between DCs and LDCs would mean that the number of jobs lost through increased imports would be significantly higher than the number gained through increased exporting by the OECD as a whole.

22. As an alternative hypothesis Balassa assumes identical rates of change for exports and imports between DCs and LDCs or a proportional expansion of trade. Since for most DCs the total value of exports to developing countries greatly exceeds the total value of imports from these countries, a proportional increase in trade implies a larger absolute increase in the value of total exports to, than total imports from, LDCs. This will be likely to lead to more job creation through increased exports than job destruction through increased imports. In fact in reworking the model the results suggest that there would be substantial positive employment effects for the OECD as a whole. The ratio of jobs gained to those lost becomes 2.8 for the OECD as a whole. A 10 per cent proportionate increase in trade flows would entail the loss of 31,000 jobs, and a gain of 183,000 jobs.

23. In fact Balassa regards this scenario as equally unrealistic and suggests that the most likely future pattern of trade flows would be based on a projection of past experience. Therefore he uses estimates from the World Bank's World Development Report as a basis for a projection of future trade flows, in order to evaluate the employment implications of future trade

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* The number of jobs required per unit value of sectoral output.

in manufactured goods between DCs and LDCs. Assuming unchanged labour coefficients, estimates for 1976-1986 indicated that the projected expansion of trade in manufactured goods between DCs and LDCs would have practically no net effect on employment in the DCs. The increase in employment due to greater exports is estimated to be 1,747,000 and the decline in employment due to increased imports is 1,736,000 in the OECD as a whole.

24. Nevertheless, substantial differences in labour-input coefficients and in capital intensity remain as between projected exports and imports in manufactured trade between developed and developing countries. There are also significant differences in projected changes in employment among occupational categories, involving a shift from low skill to high skill employment. The major losers are the unskilled and semi-skilled production workers with a net decline of 197,000 jobs. The sectoral impact of the projected increase in trade with LDCs is discussed in the next section.

25. Finally, one study by Deardorff et al(16) (1977) has adopted an entirely different methodology for examining the employment effects of a cut in tariffs by DCs. The estimates are derived using a numerical general equilibrium model in a multi-country framework. The model determines exchange rate changes endogenously together with prices and these results are used to estimate output and employment effects taking into account input/output relations. The model is a simple general equilibrium model where M countries supply and demand the products of A industries (both tradeable and non-tradeable). Equilibrium prices in all markets are attained by equalising supply and demand. The model includes eighteen OECD countries and involves numerous stringent assumptions, notably that the structure of the 1967 US table would be taken to represent the structure of all countries in the study. The model was used to simulate a 50 per cent linear cut in post-Kennedy Round tariffs in all the included countries. Absolute and percentage changes in employment were reported for each industry under fixed and flexible exchange rates. Once again the employment effects of a tariff cut were shown to be small since the simulated change in aggregate employment never exceeded 1 per cent except in the case of Belgium-Luxembourg (and then only under fixed exchange rates). However this does not imply that sectoral employment effects were equally insignificant, since employment changes in excess of 10 per cent or even in some cases 20 per cent were recorded.

26. The evidence of these studies is conflicting because, whilst the European studies suggest that a balanced expansion of trade between DCs and LDCs will have a negligible effect on total employment, the studies by Balassa and Grinols and Thorbecke suggest that it might significantly reduce total employment in the OECD and the USA. However, Balassa's more realistic assumption of identical rates of change etc. (para 22) in DC-LDC trade during 1976-1986 confirms that the total employment effects are likely to be negligible for the OECD as a whole.

27. Although total employment effects may be negligible all the studies indicate that substantial inter-industry and inter-regional movements of labour and capital are likely to occur in the DCs. This movement will cause a shift of factors from low skill sectors to high skill sectors (see next section). If these adjustments proceed smoothly and are in line with the long-run comparative advantage of the LDCs, they are likely to have a positive effect on the efficient functioning of DC factor markets and to

contribute to the long-term growth potential of these economies. The political problems they represent are, however, obvious.

Sectoral impact of increased imports from the LDCs

28. Historically, the major impact of increased LDC exports to the DCs has been upon labour intensive industries such as textiles, clothing and leather manufacturing. In the textile industry the dominance of the DCs has clearly declined in the last decade. In 1970 the industrialised countries accounted for 74 per cent of world exports and more than 71 per cent of world textile imports (see Table 5). By 1976 the figures were 63 per cent and 69 per cent respectively. In the same period the LDCs increased their share of world exports from 17 per cent in 1970 to 27 per cent in 1976 while their share of world imports declined from 19.3 per cent to 18.8 per cent. The most significant change in trade patterns in the textile industry has been the shift since 1970 from an overall DC trade surplus to a deficit of over $5 billion in 1976 and 1977.

29. The FCO report (7) (1979) on the newly industrialising countries (NICs)* indicates, however, that the economic impact of increased import penetration from NICs is not confined only to the textile and clothing sectors. As Table 6 shows, the share of the NICs in the imports of the OECD countries is becoming increasingly significant, especially in electrical machinery, light manufactures, metal manufactures, and rubber manufactures.

30. Balassa's (12) (1979) study has also indicated the likely future sectoral employment effects of increased trade in manufactures between the OECD and the developing countries. As described earlier, the estimates were based on a projected expansion of trade in manufactured goods during the 1976-1986 period. Although Balassa shows that there is practically no net effect on employment in the OECD, there are substantial changes in employment among occupational categories involving a shift from low-skill employment. The major losers are "unskilled and semi-skilled production workers". The employment effects by industrial sector are shown in Table 7. One area where the future net employment effect is likely to be large is in electrical equipment and supplies, which will increasingly involve imports of parts, components and accessories, and an eventual dominance of the LDCs in the world export of radios, televisions, automotive electrical equipment, and standardised electronics. Other areas where net employment displacement in DCs will be significant are textiles, clothing, timber and wood products, furniture, rubber goods, and leather products. The LDCs are also predicted to make significant inroads into the chemicals and primary metal sectors.

31. The evidence presented in Table 7 suggests that the retention of a liberal trading system with concomitant increases in imports of manufactures by the OECD from the LDCs will not increase overall unemployment in the OECD area. However the effects of this increased trade on the skill composition of labour in the OECD countries will necessitate a continuing shift of labour from low skill to high skill occupations. Moreover it should

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* These include Hong Kong, Singapore, South Korea, Taiwan, Malaysia, Philippines, Thailand, India, Pakistan, Iran, Brazil, Argentina, Mexico, Spain, Portugal, Yugoslavia, Greece, Turkey, Malta, Poland, Romania and Hungary.

be evident that what applies to the OECD as a whole may be very different for individual developed countries. The employment effects will inevitably be unevenly distributed between the different countries of the OECD according to economic structure, performance, and policy.

Part III : Industrial experience of adjustment

32. An examination of the reactions of certain industries in different OECD countries to increased competition from 'low cost' Third World producers indicates that adjustment in manufacturing industry mainly consists of the spontaneous response of individual firms to market forces. There are several 'survival strategies' or adjustment measures that individual firms may adopt.

33. One option is to leave the sector altogether and to begin production of an entirely different product. This seems to have been the response encouraged by the Japanese government, which stimulates employers to convert to "more viable activities" under its Employment Adjustment Scheme. A second option is for firms to move 'up market', producing within the same sector, but getting out of the mass production lines and into goods with a higher fashion and design content. The development of new products is another aspects of the 'up market' strategy. An example of this is the case of the European electrical consumer durable firms, which have constantly adapted to Japanese competition and new technology by moving first from radios to black and white TVs, then to colour TVs, and now to TV recorders. A third option is to use different production techniques, which increases cost competitiveness through improved productivity. Examples of this are the spinning and weaving of cotton textiles and the knitting industry in the UK, where substantial increases in productivity were induced by technological advances in the production process.

34. Another possibility is the development of substitute products - the strategy followed by the UK jute industry - which has been switching to the manufacture of the synthetic substitute, polypropylene (see below). The final option, which has been important for firms in the German clothing industry, is to attempt to 'internationalise' the production process. This may involve either a reciprocal agreement between DC and LDC producers, or direct investment by DC firms in low-wage countries.

35. Government policy, however, also has a significant influence upon the adjustment process. Intervention can induce adjustment either through general or selective measures and may involve trade, industry, manpower, and regional policies. These policies can impede or accelerate the process of structural change and adjustment. Significant differences may be seen between the general and broadly positive government adjustment measures of Germany on the one hand, and the more selective and negative activities of the UK and France on the other. It is also important to note the interrelationship between trade policy and selective industrial intervention. This may be assessed through a case study.

Textiles and Clothing

36. The DC textile and clothing industries provide examples of both spontaneous adjustment through the market and of different types of government intervention. As Table 8 indicates, most members of the EEC have similar restructuring schemes to help their textile or clothing industries, or

both. In addition, in many of these countries the industries are aided by general measures, such as regional policy.

37. These two industries are intimately related, since the clothing industry provides the major outlet for the yarns, fabrics and fibre output produced by the textile industry. The textile industry is the more capital-intensive and has seen some significant advances in productivity during the last 10-15 years. The clothing industry is relatively labour-intensive and, as a result, has suffered more heavily from LDC competition. Since the early 1950s the textile and clothing industries of the DCs have faced increasing difficulties, both from internal problems such as low profitability and productivity, as well as from increasing external competition from the LDCs, whose successful import substitution policies led, first, to declining export markets for the DCs, and later to increasing import penetration of the DC domestic markets. By the late 1950s the textile and clothing industries of the DCs were declining according to the various performance criteria of the DCs productivity, output and employment (de Bandt (17) (1978).

38. In the late 1950s, DC governments and textile industry firms reacted to the increased competition from the LDCs by calling for a temporary restraint of LDC exports in order to obtain a 'breathing space', whilst domestic production was restructured and 'adjusted' to the prevailing competitive conditions. In 1978 the British Cotton Board had obtained a VER with Hong Kong producers of cotton goods and the USA had already obtained voluntary restrictions of Japanese exports. These moves were the forerunners of the multilateral agreements (such as the LTA which attempted to balance increased access for LDC exports with the need to avoid market disruption in the DCs). In so far as these were intended to be temporary and to allow restructuring in DCs, this trade policy could be regarded as aiding the process of structural change by encouraging the development of a new international division of labour.

39. The problems of domestic DC textile industries were overcapacity, low productivity, the use of outdated equipment, and the fragmented nature of ownership and production. All of these brought declining competitiveness and a lack of funds to generate finance for the necessary adjustment measures. The UK, in common with many other DC governments, instituted a special restructuring policy in its Cotton Industry Act of 1959 (18) which provided subsidies for the scrapping of obsolescent equipment and for firms wishing to close down. Funds were also provided for new investment for the re-equipment of the remaining firms. The result of this strategy in the UK was a reduction in overcapacity and employment through the closure of marginal plants, and the emergence of a more competitive, capital-intensive, higher productivity industry. The UK industry had therefore followed the route of increased investment and productivity as a means of re-establishing cost competitiveness. As Miles (18) points out, however, there was a question mark over whether even these modernised plants might have been able to compete with low cost imports without protection, even after an 'infant industry' pause for reconstruction behind tariff barriers. de Bandt (1978) explains why :

> "In the last 15 to 20 years most DCs have implemented policies of this kind, the hypothesis being that, because of the increasing capital intensity of the textile industry such policies would indeed restore cost competitiveness. In fact, even with technical progress none of these policies has been able to achieve the objective....."

and

> "it has not proven possible to restore external competitiveness; even if the most sophisticated techniques are used, the costs remain higher in most cases than in the LDCs."

40. Certain firms and sub-sectors of the DC textile industries have, however, flourished. For example, the expansion and success of man-made fibres was the result of a quick reaction by DC fibre producers to changes in the demand pattern from natural to man-made fibres, a shift which has occurred in the last 10-15 years. As a result this sub-sector developed rapidly and obtained dominance over the LDCs in the production of synthetics, so that DC textile exports increased markedly. But this monopoly position is swiftly being eroded as LDCs increasingly move into this field.

41. Other successful sub-sectors, such as Scottish knitwear, have adopted an 'up market' strategy by specialising in the production of high quality products. Specialised manufacturers of industrial clothing and industrial textiles have also been relatively successful. These firms may well be able to survive without protection, but they are essentially specialised forms of textile activity and, in general, the more usual case is that the continued survival of firms in most textile sub-sectors is heavily dependent upon the continued use of trade restrictions. de Bandt has estimated that if complete liberalisation of trade in textiles were implemented, 70 per cent of total DC production of textiles would come under severe competition from LDCs.

42. Another possible adjustment strategy has been demonstrated by the ODI jute study.(19) The European jute industry has been protected from Asian imports for many years, because manufacturing costs are significantly higher in the former countries due to the unsophisticated nature of the production process and the simple technology used in jute manufacturing. In UK the industry has declined in terms of output and employment since the 1950s although most markedly since 1970. This decline, however, is not due to low cost Asian imports, since these have been restricted by protection. It is caused by the manufacture of a synthetic substitute, polypropylene which, by 1976, had replaced jute in most of its traditional markets. During the past ten years all the significant jute manufacturers have switched to mainly polypropylene production which, because it involves a capital-intensive production process, has meant a substantial net loss of jobs. Protection facilitated this development by allowing jute firms to survive whereas in the more open US market they disappeared. In this case protection postponed trade adjustment, but precipitated a technological adjustment that would have occurred later anyway, with all the painful consequences for labour of industrial contraction.

43. There are two ways to approach the adjustment problems presented by the DC clothing industry. One is to rely more heavily on market forces to guide the adjustment process, which seems to be the strategy in Germany. And the other is to use government intervention as a stimulus for structural change. Schwarting's study(20) of the German clothing industry has provided a useful description of its attempts to circumvent the competitive disadvantage of the comparatively high level of wages in the German clothing industry. Many German firms adjusted by entering an agreement with a producer in a low-wage country. This arrangement, known as 'outward

processing', involves the export of cloth from Germany to the low wage country, where it is made up into finished articles and reimported. This has become an important adjustment strategy for the German industry since about 16 per cent of total German clothing imports now come from this source. The German manufacturers have thus attempted to 'internationalise the production process' and to 'internalise' the advantages of low wage within the German firms.

44. Schwarting also identifies two other 'survival' strategies that are likely to become important for the survival of the German industry. First, there is the option of direct investment by German firms in the low wage countries. Second, some German firms might attempt to move out of the production of 'down market' goods where prices are lower and no longer profitable, and concentrate on high grade products where quality, design and marketing skills are important, and where the German industry may have an advantage over foreign low-cost producers, since it is closer to the main markets.

45. As regards government intervention in the clothing industry Torre and Bacchetta (21) have provided an interesting insight and comparison of policy measures. They make a distinction between those countries (Holland, Belgium, Italy and the UK), where intervention has been selective and explicitly designed to preserve employment, and those like Germany where intervention is economy wide and no employment subsidies are used. As Table 9 shows, the former group of countries have all spent substantial sums on a per capita basis solely for the preservation of employment. The trading performance of the European clothing industry is shown in Table 10.

46. In the United Kingdom the government instituted the Temporary Employment Subsidy (TES) in 1975 as a means of encouraging firms to defer redundancies in the wake of the 1974 recession. The textile and clothing sectors became the major beneficiaries, and it has been estimated that more than 80,000 workers in both industries benefited from the scheme. Although it was abandoned in mid-1978, due to EEC opposition, a new scheme involving employer subsidies for temporary short-time working has recently been introduced.

47. The other major strand of policy in the UK was the clothing industry development scheme (CIDS) which was operated as part of the government's Industrial Strategy of 1975. The CIDS sought to encourage reorganisation, rationalisation, and greater concentration of activity in more efficient units. Selective financial assistance was provided under the 1972 Industry Act for reorganisation or restructuring projects and for the introduction of new machinery to increase productivity. This is similar to the scheme which was operated in the woollen and worsted sector, where selective financial assistance was provided for re-equipment, combined re-equipment and rebuilding projects, and grants for companies ceasing to trade.

48. In contrast, the German government has largely avoided direct intervention in the industry, despite the rapid contraction of domestic employment during 1973-1977. No special programmes of assistance were adopted, but clothing manufacturers could benefit from general and regional assistance programmes. The European Recovery Programme, originally set up in 1947, provides assistance to small businesses for structural adaptation and for export promotion and development assistance. Over 3 billion DM were dispersed in 1978 as loans at reduced rates of interest,

credit facilities for the export of capital goods to LDCs, and soft loans to encourage direct investment by German firms in LDCs. Each province also supplies subsidies and loan guarantees as part of the regional assistance programme.

49. The most significant conclusion to emerge from this brief examination of the DC textile(22) and clothing industries is that, despite the diversity of possible adjustment measures open to DC firms, they remain reliant upon continued protection for their future existence in anything like their present size and form. Second, although there is no doubt that individual schemes such as the CIDS have substantially increased productivity, there is still virtually no prospect of these rejuvenated firms being able to compete at world market prices. Instead the protection of the DC industries has effectively meant that these industries were shielded from LDC competition so that any restructuring activity has in fact merely made them more able to compete amongst themselves. Finally, selective industrial assistance for the support of industrial sub-sectors with limited growth potential is essentially protectionist, and may not only slow down overall economic growth, but may also be counter-productive in employment terms, since any new investment usually involves 'capital deepening' and consequently declining employment. This has certainly been the case in cotton and wool textiles.

Part IV : Positive Adjustment - Problems and Policies

50. The OECD(23) defines positive adjustment measures as those which aid the reorganisation of existing industries affected by changes in the pattern of world production and trade in a way which is economically efficient, does not attempt to maintain the status quo, and assists structural change which is taking place through market forces or would take place if market forces were allowed to play. Positive policies should also be temporary and compatible with trade agreements.

51. However in the ex ante situation it is often very difficult to categorise government policy according to its 'positive', 'negative' or 'neutral' character. For example, DC trade policy toward 'low-cost' textile and clothing supplies was originally designed to have a 'positive' effect. Yet in practice in many countries trade protection has been used to shelter domestic textile and clothing industries, whilst selective government assistance has encouraged new investment even though this could not be justified at world market prices. In contrast Japan has avoided such 'negative' adjustment measures, and has maintained the original 'positive' element of the multilateral trade negotiations by actively encouraging diversification away from those lines of production in which the country had no comparative advantage. This has been attained through an active disinvestment policy, involving large-scale compensation of labour and capital.(24) An active disinvestment policy has also been a feature of Swedish and Dutch industry policy, as well as figuring prominently in the selective US footwear industry scheme and the UK Cotton Industry Act.

52. Equally some policies such as selective employment subsidies to labour-intensive industries have been labelled as 'negative' measures since they slow down industrial transformation and are therefore inhibiting to efficiency and growth in the long run. However these policies may have had some positive effects. This possibility is suggested by recent research

(admittedly disputed) which indicates that the United Kingdom's Temporary Employment Subsidy scheme has actually facilitated product diversification by beneficiaries and has not adversely affected productivity growth. (25) Finally, one cannot even assume that selective intervention in expanding industries necessarily constitutes positive adjustment, since government intervention in advanced technology industries, such as aerospace, has often been economically inefficient, and has become permanent. Other difficulties concerning the distinction between negative and positive policies are dealt with in the OECD paper quoted above.

Manpower Adjustment Policies

53. Despite these difficulties the OECD has outlined the essential elements of positive manpower policies, (26) which should attempt to increase the speed of labour mobility and therefore economic efficiency. Favoured policies include easily accessible and flexible provisions for the retraining of displaced workers. This can be achieved through the provision and subsidisation of government vocational training centres, and by the subsidy of private schemes or individual workers who may wish to seek their own retraining independently. A second, positive adjustment policy is the use of generous redundancy payments (preferably as a lump sum cash payment), in order to encourage movement to other jobs or alternatively a degressive unemployment supplement could be used. Another precondition for an efficient labour market is geographical mobility which may be encouraged by housing and other general policies. Specific measures could also be adopted on the lines of the European Social Fund and US Trade Adjustment provisions, which were designed to cover all or most of relocation expenses. Finally, demand measures, such as job creation schemes, can also have positive adjustment effects.

54. Government manpower policies in the OECD countries have had both positive and negative adjustment effects. As Table 11 indicates, as a result of the recession of 1974/75, there was a general shift in the manpower policies of the OECD countries toward job creation and employment maintenance programmes which were added to the more traditional income maintenance policies. In many countries the subsidised maintenance of employment in the business sector, as a means of carrying workers over a temporary economic slow-down, was introduced. This was accomplished by a variety of means, including temporary wage subsidies for building up inventories and for short-time work programmes.

55. The retention and even in some cases increased use of job maintenance programmes in recent years has concerned the OECD Secretariat (27) which argues that such policies, if kept in place too long, are likely to inhibit the adjustment process. In Sweden, for example, employment subsidies have been continued and even increased. In Canada Public Service Employment Programmes and the Local Employment and Assistance Programmes are to be increased.

56. Current trends in the manpower policies of some OECD countries have, however, given rise to a cautious optimism that a shift toward policies which facilitate adjustment is already underway. This is suggested by the fact that job retention and job creation measures have actually declined. For example, the German short-time working programme (which allowed workers to receive partial compensation from their employers for hours not worked) provided support for over 750,000 workers in the recession of the

mid-1970s but only 250,000 in 1978. In the UK a decision to terminate the TES was taken in 1978. (28) Second, there has been a shift to 'targeted' programmes. This has been most noticeable in the USA where the public service employment programme is gradually being reduced and increasingly targeted toward structurally unemployed, and other groups of disadvantaged workers. Finally, and most significantly, there seems to be an increasingly close relationship in some OECD countries between specific adjustment targets and manpower policy. In the Netherlands manpower and employment policy has become specifically tied to industrial restructuring plans, whereby the government supplies a range of support for enterprises involved in the plan. These include special support for workers affected by the reorganisation, including special training programmes and allowances, incentives for moving to new jobs, and supplementary retirement benefits. Japan has also introduced new measures to facilitate adjustment, including the conversion of the Employment Adjustment Scheme to the New Employment Stabilisation Fund, by which employers are encouraged to convert to more viable activities.

Industry Policy and Positive Adjustment

57. In examining the question of how industry policy can stimulate positive adjustment it is important to recognise that the optimum industry policy may in fact be not to have one at all. (29) Support for this view comes from the successful example of certain OECD countries, like Germany (and to a lesser extent the USA) which has experienced massive job creation since 1973 (10 million new jobs since 1975 albeit with a decline in productivity) despite the almost total lack of an industry policy. Second, although OECD countries with active industry policies have produced some genuine positive adjustment effects (notably the activities of the National Enterprise Board in the UK), these governments have often directly intervened in declining sectors. This is likely to be unsuccessful unless assistance is linked to, and made conditional upon, diversification strategies by the firms involved. Successful diversification involves a movement toward the production of goods which can be sold profitably at world market prices. This can occur through upgrading styles and technologies and, in fact, in most sectors this happens without government intervention. Government encouragement of this process through industry policy is comparatively rare, but possible examples are Dutch restructuring policy and the US footwear industry scheme.

58. A second aspect of positive adjustment policy in industry concerns the need to develop some anticipatory or forecasting mechanism by which governments can 'pick the winners' of the future. This could involve the improvement of medium-and long-term forecasting of industry and sub-sector development patterns, which would allow the active encouragement of the most promising sectors and the discouragement of problem ones. In fact some OECD governments already follow that strategy on an ad hoc basis (e.g. the UK government's micro-electronics industry support programme). Japan's economic planning agency, MITI, is engaged in this type of anticipatory activity, by attempting to encourage the development of Japanese firms in eight industries for the future, which include automation of assembly line industries, and high technology industries like computers.

59. Assistance to small firms, possible through the manipulation of the tax system, could also assist the long-run adjustment process, since comparative research on DC economies suggests that the rates of formation of new firms explains a significant proportion of the difference in industry performance.

60. Finally protection through either subsidy, tariff or quotas should be used as little as possible and only as a last resort. If such a policy encourages new investment, in order to ensure positive rather than negative adjustment effects, the protected sector should be subject to strict 'infant industry' controls, whereby an eventual return to competition at world market prices would be envisaged.

61. It would be pointless to attempt to summarise the numerous industry policy measures of the OECD countries, and in fact an inventory of adjustment measures taken by member governments since 1974 is available (30). Nevertheless, a tentative general conclusion may be drawn as regards industry policy and the objective of positive adjustment. In terms both of efficiency and employment objectives, the avoidance of direct government intervention in industry would seem to be the optimum positive adjustment policy for those countries which have traditionally been more market oriented. For those countries where government intervention has traditionally been more important, an anticipatory system based on long-term planning with strict efficiency controls might constitute an effective positive adjustment industrial policy.

62. This brief examination of the positive adjustment measures in the industry and manpower policies of the OECD countries indicates that most government policy has conflicting elements which are likely to lead to both positive and negative adjustment effects. But the balance of these forces has become increasingly negative in countries like the UK, and this may be recognised by the greater resort to quota and other forms of trade protection, as well as the failure to entirely phase-out selective employment or to discourage reinvestment in declining industrial sectors.

FOOTNOTES

1. See J. Riedel, 'Monitoring Trends in Protectionism', World Bank, February, 1979.

2. See S. Page,'The Management of International Trade', in National Institute of Economic and Social Research, Review, April 1979.

3. This refers to policies that directly limit foreign competition such as safeguard (or escape) clauses which are measures to mitigate economic dislocation from increasing import competition. Countervailing duties and anti-dumping duties are excluded in this study.

4. See V. Cable,'Britain, the MTNs and Developing Countries', Submission to the House of Lords Select Committee of the European Communities Committee - Sub-Committee Investigation into the Multilateral Trade Negotiations.

5. See Note on the methodological problems of employment models in Appendix.

6. See V. Cable,'British Protectionism and LDC Imports', in ODI Review, No. 2 pp 29-48.

   C. R. Frank Jnr., 'Foreign Trade and Domestic Aid' (The Brookings Institution), 1977.

   F. Wolter, 'Adjusting to imports from Developing Countries - The evidence from a Human Capital Rich - Resource Poor Country', in H. Giersch (ed.) 'Reshaping the World Economic Order' 1977.

7. Foreign and Commonwealth Office -'The Newly Industrialising Countries and the Adjustment Problem' - January 1979.

8. Estimates are derived from the formula :

$$dE_i = \frac{1}{P_{it-1}} \left[dC_i + dX_i - dM_i - E_{it-1} \cdot dP_i \right]$$

   where C = domestic consumption, P = labour productivity, i = ith sector, E = employment, X = exports, M = imports.

9. Frank uses the following formula :

$$r_e = r_d (D/Q) + r_x (X/Q) - r_m (M/Q) - r_p$$

   where r_e = growth or employment in each of the five digit import competing industries.

   r_d, r_x, r_m and r_p are the percentage rates of growth of domestic demand, exports, imports and productivity respectively. The quotients D/Q, X/Q and M/Q are the ratios of domestic demand,

exports and imports to output (Q). r_d (D/Q) and r_x (X/Q) can be interpreted as the contribution of the growth in domestic demand and exports respectively to the growth of employment and r_m (M/Q) and r_p as the (negative) contributions of the growth of imports and productivity, respectively.

10. In input/output studies employment changes are calculated using the formula : $\Delta E = \hat{L} \ (I-A)^{-1} \quad \Delta B$

where $\hat{L}$ = diagonal matrix of labour coefficients, $(I-A)^{-1}$ = an inverse leontief matrix and ΔB = vector of changes in trade flows.

11. P. de Grauwe, et al,'Trade Liberalisation with the Less Developed Countries : A case study of Belgium', Bulletin de l'Ires No. 44, 1977, pp 1-6.

E. Grinols and E. Thorbecke, 'The Effects of Trade between the US and Developing Countries on US Employment'. Working Paper No. 171, Department of Economics, Cornell University 1978.

J. Kol and L.B.M. Mennes, 'The Role of the Developing Countries in the Dutch Market of Manufactures. Impact on Income and Employment', Netherlands Economic Institute, deelrapport 6, Rotterdam, February 1978.

D. Schumacher, 'Increased Trade with the Third World : German Workers will have to switch jobs, but not lose them'. Deutches Institut fur Wirtschaftforschung, Economic Bulletin No. 5,1977, pp 37-41.

12. B. Balassa, 'The Changing International Division of Labour in Manufactured Goods', Banca Nazionale Del Lavoro Quarterly review, September 1979.

13. R. E. Baldwin, 'Trade and Employment Effects in the US of Multilateral Tariff Reduction', American Economic Review Vol. 66, May 1976, pp 142-148.

R. E. Baldwin, 'Measuring Trade and Employment Effects of Various Trade Policies', in Baldwin, Stern and Kierzkowski, 'Evaluating the effects of trade liberalisation', 1979.

See also R. E. Baldwin and W. E. Lewis, 'US Tariff Effects on Trade and Employment in Detailed SIC industries', US Department of Labour 1976.

14. Baldwin assumed that foreign and domestic goods within each sector were imperfect substitutes and that import and export supply curves are completely elastic (see Baldwin 1976).

15. The increase in the value of imports or exports of any commodity is calculated by :

$$\Delta M = Mo \ . \ em \ . \ \frac{t}{1+t}$$

where Mo = the initial value of imports.

Employment effects are calculated using a modified version of the the input/output formula described earlier.

$$\Delta E = \hat{L} (I-A)^{-1} \left[\Pi_j \right] \Delta B$$

where Π_j = a diagonal matrix of substitution terms normally between zero and one.

16. A. Deardoff, et al, 'A Multi-Country Simulation of the Employment and Exchange Rate Effects of Post-Kennedy Round Tariff Reduction', in N. Aknasaree, S. Naya and V. Vichit-Vadakan (eds.), 'Trade and Employment in Asia and the Pacific', 1977.

17. Jacques de Bandt, 'Interfutures - study of the Textile Industry' - 1978.

18. See C.Miles, 'Protection of the British Textile Industry', in W.M. Corden and G. Fels, 'Public Assistance to Industry'.

19 S. McDowall and P. Draper, 'Trade Adjustment and the British Jute Industry : A Case Study', ODI Research Monograph No. 5.

20. U. Schwarting, 'Strategies for Survival of the German Clothing Industry', Intereconomics, January/February 1979.

21. J. de la Torre and Bacchetta, 'Decline and Adjustment : European Policies toward their Clothing Industries' - European Institute of Business Administration, Fountainbleu, France, June 1979.

22a. For a further discussion of German experience in the textiles sector see A.D. Neu, 'Protection of the German Textile Industry', in Corden and Fels op.cit.

22b. The adjustment experience of UK textiles, clothing and footwear industries is dealt with in 'Adjustment to North-South Trade in the UK Economy' (ODI consultancy for ILO).

23. OECD Industry Division - Meeting of Experts to Examine Positive Adjustment in Industry, Paper II : Factors influencing the shift to positive adjustment policies (prepared by V Cable).

24. ibid. p 2.

25. ibid. p 2.

26. OECD Manpower and Social Affairs Committee, 'Manpower and Employment Measures for Positive Adjustment', 1979.

27. ibid. p 19.

28. ibid. p 18.

29. OECD Industry Division, p 16.

30. OECD Industry Committee: Report to the Council on Positive Adjustment Policies in the Industry Sector, Annex 1, 'Inventory of the Adjustment Measures Taken by Member Governments since 1974'.

Table 1

Recent Non-Tariff Barriers in Selected OECD Countries

Product / Country	USA	UK	Italy	France	Germany
Steel	TP (1977)	All EEC members use QR (since February 1978) (previously TP 1977)			
Non-leather footwear		QR (1977) on Taiwan, VER on Eastern Europe			
Motorcycles			QR (1977) on Japan		
Motor cars		VER (1977) on Japan			
Portable black and white television sets		OMA (Japan) QR (1977) on South Korea			
Colour television sets and parts	OMA (1977) on Japan, South Korea and Taiwan, and (1978) on China				
Enamelled iron and steel				QR (1977) on Spain	
Cast iron tubes and pipes			QR (1976, extended 1978) on Taiwan		
Bags and sacks of polyethylene		QR (1976) on South Korea			
Sisal binder twine		All EEC members use QR (1975)			
Textiles and textile products	QR under MFA	Bilateral quotas for all EEC members under MFA (QR 1975/76), principally aimed at South Korea, Taiwan and Brazil			

Table 1 Cont..

Product/Country	USA	UK	Italy	France	Germany
Tape recorders			QR (1973) VER (1974)		
Bolts, nuts and screws	T on Japan and Canada (Dec 1978)				
High carbon ferro-chromium	T on South Africa, Brazil, Rhodesia, Japan				
Non-rubber footwear	OMA (1977) on Taiwan and South Korea, (1978) on Hong Kong				
Stainless steel and alloy tool steel	OMA on Japan, global quota other suppliers (March 1976) Retained (Jan 1978)				
Radios	VER on Japan	OMA on Japan		Restrictions on South Korea	
Umbrellas				Restrictions on South Korea	Restrictions on South Korea
Jute		Bilateral EEC quotas and VER on India and Bangladesh			
Calculators	OMA (Japan)	OMA on Japan			

Notes :

1. Tariffs granted under GATT escape clauses = T
2. Quantitative Restrictions = QR
3. Voluntary Export Restraint Agreements = VER
4. Orderly Marketing Arrangements = OMA (OMAs are regarded as arrangements with formal and explicit government involvement).
5. 'Trigger pricing' = TP (a system of trigger prices according to which anti-dumping actions would be automatically initiated if imports should enter below minimum (trigger) prices established on the basis of the level of production cost of the most efficient supplier).

Sources : Compiled from: Riedel (tables 3 and 5), IMF survey (1978), Foreign Trade Review, Quarterly Journal of Indian Institute of Foreign Trade.

Table 2

Import Penetration in Industrial Countries[a]

(per cent of home market)

		Textile imports		Clothing imports	
		Total	From developing countries	Total	From developing countries
EEC[b]	1959/60	6.1	0.9	2.4	0.6
	1971/72	10.5	2.3	8.2	2.8
	1973/74	14.1	3.5	12.9	4.7
UK	1959/60	14.0	5.2	9.5	3.9
	1971/72	26.8	5.2	21.9	8.8
	1973/74	34.6	6.4	30.3	11.7
USA	1959/60	5.5	1.6	3.5	0.8
	1971/72	9.4	2.8	12.6	4.4
	1973/74	8.7	3.3	13.4	5.8
Japan	1959/60	1.1	0.1	1.4	0.7
	1971/72	9.0	1.6	8.4	3.5
	1973/74	12.7	3.1	17.0	8.6
All industrial countries	1959/60	3.0	1.6	1.7	1.0
	1971/72	7.5	2.6	8.2	4.1
	1973/74	7.8	3.6	11.8	6.0

Notes : a EEC figures exclude intra-EEC trade; all industrial countries figures exclude trade between the EEC, UK, USA and Japan.

b Original six members.

Source : UNCTAD Handbook of International Trade and Development Statistics, 1976.

Table 3

Sources of Employment Changes in Selected UK Industries Competing with NICs, 1970-75[1]

MLH Industry Group	Overall change in employment	Attributable to changes in: Home demand	Productivity	All external trade	Ext. trade with LDCs	All imports	Imports from LDCs
444 Men's shirts, overalls, underwear	+ 1,800	+ 29,282	- 12,439	- 15,043	- 12,429	- 19,709	- 13,475
417 Hosiery and other knitted goods	- 14,200	- 6,472	+ 2,187	- 9,915	- 6,666	- 8,412	- 7,442
445 Dresses, lingerie, etc	+ 3,900	+ 47,245	- 36,259	- 7,086	- 4,794	- 9,625	- 5,676
442 Men's and boys' underwear	- 12,900	+ 24,676	- 22,862	- 14,714	- 4,377	- 18,924	- 5,127
413 Weaving of cotton and man-made fibre	- 13,800	+ 15,430	- 12,377	- 16,853	- 4,269	- 20,264	- 4,337
443 Women's and girls' tailored outerwear	- 3,100	+ 11,983	- 10,895	- 4,185	- 2,576	- 5,330	- 2,719
441 Weatherproof outerwear	- 3,500	+ 4,246	- 4,452	- 3,294	- 1,190	- 3,135	- 1,230
414 Woollen and worsted	- 36,100	- 22,846	- 5,925	- 7,329	+ 975	- 2,723	- 159
422 Made-up textiles	+ 2,100	+ 10,908	- 5,273	- 3,535	+ 480	- 4,697	- 50
411 Man-made fibres	- 1,600	+ 10,445	- 9,234	- 2,811	+ 671	- 3,505	+ 23
449 Dress industries	- 2,700	+ 6,577	- 8,412	- 865	+ 1,417	- 242	+ 1,348
412 Cotton spinning and doubling	- 26,300	- 18,802	- 7,176	- 322	+ 4,239	- 1,751	+ 3,571
Jute	- 1,600	- 2,760	- 984	+ 2,144	+ 1,956	+ 2,171	+ 1,983
TOTAL TEXTILES	-108,000	+109,912	-134,101	- 83,813	- 26,563	- 96,146	- 33,290
432 Leather goods	+ 400	+ 5,270	- 2,668	- 2,202	- 1,119	- 2,202	- 1,047
431 Leather tanning	- 2,700	+ 3,151	- 5,089	- 762	- 3	- 308	- 3
TOTAL LEATHER INDUSTRY	- 2,300	+ 8,421	- 7,757	- 2,964	- 1,122	- 2,510	- 1,050
TOTAL FOOTWEAR INDUSTRY	- 8,300	+ 16,283	- 18,277	- 6,306	+ 314	- 3,702	+ 502
OVERALL TOTAL	-118,600	134,616	-160,135	- 93,083	- 27,371	-102,358	- 33,838

(1) Data derived from formula: $dE = \frac{1}{P_t}(dD + dX - dM - E_{t+1} dP)$ where dE is the change in employment, P is productivity per worker year, D is home demand, X is exports, M is imports, t is the initial time period 1790, and t+1 is 1975.

Source: UK Foreign and Commonwealth Office, table 17.

Table 4

Input/output Studies

Study	de Grauwe et al	Grinols and Thorbecke	Baldwin (1979)	Kol and Mennes	Schumacher
Country	Belgium	USA	USA	Holland	Germany
Input/output table used	1970	1972 (157 sectors) 22 industries	1967(367 sectors) trade and tariff data, import and export demand elasticities, labour coefficient.	1973 trade data	1972 prices and trade patterns and 1976 sectoral labour coefficients.
Focus	effects of BF1 bn expansion of exports and imports.	effects on sectors where changes in the net trade balance exceeded $175mn.	employment effects of 50% cut on dutiable imports by the USA.	Dutch Fl. 10mn balanced trade expansion.	Increased imports from LDCs of Dm 1bn. Sectoral effects on precision and optical products, leather manufactures (including footwear), textiles and clothing.
Employment effects	Minimal effect on net labour demand in Belgium. In no case does the net decline exceed 0.1% of total employment.	Net gain of 219,000 jobs (reduced to 147,000 if four food processing industries are omitted).	Net change in employment of 15,200 in all industries. Net change in manufacturing of 31,700.	Total employment hypothetically foregone due to imports of manufactures from LDCs of 55,000 or 1.3% of 1973 employment (40,000 in manufacturing sectors).	Net effect virtually zero. But structural effects large: 60% of workers displaced by imports would have to move to another industry. By 1980 140,000 jobs lost due to increased imports from LDCs.
Sectoral effects	Sectoral analysis shows displacement effect of increased trade with LDCs to be three times greater than trade with other areas. Concentration of job losses in textiles, clothing, leather and footwear.			Net losses concentrated on food products, textiles, clothing, leather, wood and furniture. Net gains in chemicals, metal products, machinery, engineering products and transport equipment.	66% of job losses concentrated in textiles and clothing.

Table 5

Balance of trade in textiles between industrial countries and other groups, 1963-1977

($ billion)

	1963	1968	1970	1973	1976	1977
EEC						
Total	1.01	1.21	1.46	1.97	1.47	1.70
With Southern Europe	0.04	0.08	0.09	-0.09	-0.05	-0.01
With LDCs	0.29	0.31	0.27	0.11	-0.06	0.07
With Eastern bloc	0.01	0.12	0.15	0.28	0.38	0.32
USA						
Total	-0.10	-0.44	-0.54	-0.36	0.32	0.17
With Southern Europe	-0.02	-0.03	-0.02	-0.02	0.03	0.02
With LDCs	-0.08	-0.18	-0.14	-0.24	-0.20	-0.16
With Eastern bloc	0.00	-0.01	-0.01	-0.01	-0.05	-0.03
Japan						
Total	0.86	1.28	1.50	1.32	2.39	2.84
With LDCs	0.51	0.77	0.90	1.01	1.65	1.93
With Eastern bloc	0.02	0.03	0.08	-0.02	0.12	0.23
Industrial Countries						
Total	1.14	1.43	1.64	1.71	2.59	3.17
With Southern Europe	0.02	0.04	0.06	0.04	-0.02	0.02
With LDCs	0.70	0.86	0.99	0.76	1.27	1.76
With Eastern bloc	0.01	0.10	0.19	0.18	0.39	0.48

Source: Torre and Barcetta.

Table 6

Share of NICs in total OECD and UK imports of manufactures by major categories, 1977

(per cent of total for category)

	OECD	UK
Clothing	39.1	45.6
Leather, travel goods and footwear	31.3	25.1
Textiles	12.1	14.8
Electrical machinery, apparatus and appliances	12.0	6.3
Light manufactures, excluding clothing and footwear	11.2	8.9
Miscellaneous manufactures of metal	7.4	8.9
Manufactures of rubber	7.6	5.5
Iron and steel	4.8	3.8
Machinery other than electric	2.8	2.8
Transport equipment	2.8	0.8

Source: UK Foreign and Commonwealth Office, table 13.

Table 7

Sectoral employment effects in OECD of increased trade with LDCs (1976/86)

(000 jobs)

	Exports	Imports	Balance
Textile mill products	47.8	158.6	-110.8
Apparel and other textile products	14.0	266.1	-252.1
Lumber and wood products	3.6	41.9	38.3
Furniture and fixtures	6.8	16.8	-10.0
Paper and allied products	24.6	4.5	20.1
Printing and publishing	18.5	4.3	14.2
Chemicals and allied products	121.1	56.0	65.1
Petroleum products	.4	.1	.3
Rubber and plastic products	11.0	100.6	-89.6
Leather and leather products	3.4	57.7	-54.3
Stone, clay and glass products	17.8	17.4	.4
Primary metal and allied products	66.8	48.9	17.9
Fabricated metal products	31.6	12.9	18.7
Non-electrical machinery	510.1	100.0	410.1
Electrical equipment and supplies	403.6	656.1	-252.5
Transportation equipment	360.1	73.2	286.9
Instruments and related products	70.3	28.4	41.9
Miscellaneous manufactured products	35.4	92.5	-57.1
Total	1,746.8	1,736.0	10.8

Source : Balassa, page 280.

Table 8

Adjustment measures in the OECD Textile and Clothing Industries

Italy (1969)

Large-scale government subsidies for the establishment of new firms and for the re-equipment, modernisation and improvement of existing firms (since 1971). Applies to both industries. Emphasis is on increasing investment. Investment grants and interest-free loans for firms in South Italy (1976). General aids to small firms. Government ownership greately extended.

Belgium (1975)

Interest-free loans for firms in clothing and knitwear.

France

Changes on imported textiles (1965). Finance for maintenance of employment loans from the Economic and Social Development Fund (1977).

U K (1974)

Selective financial assistance in wool textile scheme for modernisation, improvement of industrial structure, reduction in excess capacity. Clothing industry scheme (1975). Grants for consultants, and new machinery to increase productivity. Assistance for re-organisation and restructuring. Grants under the Industry Act (1972).

Germany

Funds to both industries via Federal and provincial governments for increased productivity. Assistance from regional development at Federal and provincial level.

Netherlands (1975)

Grants to cotton, linen, rayon sectors for investment and R & D. Payroll grant to knitwear and hosiery for restructuring.

U S A

Government Trade Adjustment Assistance Programme. General to all industries. Financial assistance to firms and workers displaced by trade. Export promotion programme for entire textile and apparel industry.

Table 9

Average Yearly Financial Subsidies Per Worker in the EEC Clothing Industry, 1975-77 [1]

(in current US dollars)

	Italy	Belgium	France	UK	Germany	Netherlands
1. Employment :						
Assistance	-	40 [2]	-	150	-	200 [3]
Creation	-	-	30	-	-	-
2. Investment :						
Specific	35	-	-	30	-	60
General	4	10	1	5	0.5	-
Regional	7	-	6	15	1.5 Federal (?) Lander	-
3. Marketing + Export	7	-	4	-	-	40
4. R & D	1	-	0.5	-	-	-
5. Specific intervention	220 [4]	-	4.5	-	-	-
Total	274	50	46.0	200	2(?)	300

1 The corresponding figures for Norway and Sweden were $2130 and $2250 per worker respectively.

2 A second programme of similar magnitude was planned for 1978.

3 Discontinued since 1977.

4 Represents losses incurred in nationalised firms (over $2200 per worker in 1976, or 20% of turnover), which accounted for about 10% of clothing industry employment.

Source : Torre and Barcetta.

Table 10

EEC Clothing industry, 1970-76

Changes in employment

	1970-73	1973-76	1970-76	1976-77
Italy	+4.3	-4.6	-.5	-2.4
Belgium	+12.0	-19.4	-9.7	-11.6
France	-.3	-12.7	-12.9	-2.8
UK	0	-12.6	-12.6	+2.1
Germany	-5.1	-22.2	-26.6	-4.0
Netherlands	-32.2	-37.6	-57.7	

Trade performance: Net exports over apparent consumption[1]

	1970	1973	1976
Italy	+9.8	+8.5	+12.4
Belgium	+17.2	+13.4	-4.5
France	+7	+9	+3.8
UK	-1.6	-9.0	-11.0
Germany	-6.8	-11.8	-15.6
Netherlands	-3.6	-23.9	-49.1

1 Ratio (X-M)/C

Trade performance: change in net exports over apparent consumption[2]

	1970-73	1973-76	1970-76
Italy	-1.3	+13.9	+12.6
Belgium	-3.8	-17.9	-21.7
France	+2.0	-5.2	-3.2
UK	-7.4	-2.0	-9.4
Germany	-5.0	-3.8	-8.8
Netherlands	-20.3	-25.2	-45.5

2 Arithmetic change in the level of import penetration from from the beginning to the end of the relevant period.

Source: V.Cable,'World textile trade and protectionism'.

Table 11

Spending On Selected Manpower Adjustment Policies in Selected Countries in the Period 1961-1977

		As a Percentage of Gross Domestic Product				As a Percentage of Public Expenditure	Unemployment Rate
		Measures to improve the labour exchange	Training	Job Creation & Job Maintenance	Total	Total	
Canada	1968	.06	.26	.03	.35	1.05	4.8
	1969	.07	.30	.00	.37	1.09	4.6
	1977	.19	.30	.23	.73	1.82	8.1
Germany	1968	.13	.04	.15	.32	.87	1.2
	1969	.13	.06	.16	.35[a]	.98[a]	0.7
	1976	.16	.19	.61	1.00[a]	2.24[a]	4.1
Japan	1969	.15	.02	.08	.25	1.64	1.1
	1970	.18	.02	.07	.27	1.75	1.1
	1976	.19	.04	.07	.30	1.63	2.0
Norway	1964	.08	.11	.11	.30	.90	2.1
	1968	.10	.10	.09	.29	.77	2.2
	1976	.01	.09	.49	.59	1.21	1.8
Sweden	1961	.07	.09	.36	.51	1.65	1.5
	1970	.16	.28	.24	.68[b]	1.59[b]	1.5
	1976	.28	.72	1.10	2.16[b]	3.99[b]	1.6
U.K.	1968	.04	.03	.00	.07	.18	3.3
	1970	.06	.04	.00	.09	.23	3.1
	1976	.09	.34	.38	.82[c]	1.77[c]	5.5
U.S.A.	1969	.05	.09	.05	.19	.62	3.5
	1970	.06	.11	.05	.22	.66	4.9
	1976	.04	.26	.41	.71	2.03	7.6
Data available for 1976 only:							
Australia		.06	.11	-	.17	.50	4.5
Austria		n.a	n.a	n.a	.17[d]	.54[d]	1.7
Finland		.02	.33	.91	1.28[e]	3.26[e]	4.0
Ireland		.01	.45	.14	.67	n.a.	9.4
New Zealand		n.a.	.03	.25	.28	n.a.	0.5
Switzerland[f]		.01	.17	-	.18	.62	0.3

Notes to Table 11

a These totals include DM 430 million for "Temporary Measures to Facilitate the Reintregration of Unemployed Persons" and DM 10.5 million for "Assistance to Workers in Coal, Iron and Steel." These figures do not appear in any of the three sub-categories due to unavailability of detailed breakdowns.

b These totals include an amount of SKr 170 million for "Incentives for the Employment of Handicapped" that does not appear in any of the three sub-categories due to unavailability of a detailed breakdown.

c These totals include £.45 million for "Integrated Work Force Units" that does not appear in any of the three sub-categories due to unavailability of a detailed breakdown.

d These totals include an amount of Aus. Sch. 1,027 million for the "Labour Market Promotion Act" that does not appear in any of the three sub-categories due to unavailability of a detailed breakdown.

e These totals include an amount of Fmk 21.4 million for "Regional Development Laws" that does not appear in any of the three sub-categories due to unavailability of a detailed breakdown.

f Data are for 1975.

Sources :

Data on GDP in current prices in domestic currency, taken from OECD, National Accounts of OECD Countries.

Data for spending on manpower adjustment policies for the years previous to 1976 are taken from OECD, Inflation, The Present Problem.

Public expenditure was defined as total expenditure, both current and capital, of general government, taken from OECD National Accounts of OECD Countries.

Unemployment rates taken from MAS (78) 22.

Data for spending on manpower adjustment policies for 1976, 1977, 1978 are taken from Inventories of Employment and Manpower Measures MAS/WP5(78)3. In the case of Japan, data for all of the years indicated, i.e. 1969 and 1976, was provided especially for inclusion in this table by the Japanese authorities.

APPENDIX

Note on the methodological problems of employment models

1. One important issue is whether a fixed or flexible exchange rate is assumed. All of the studies examined in this paper apart from the work of Baldwin implicitly assume a fixed exchange rate regime throughout or that changes in the trade balance will have such a small impact on the exchange rate that the additional employment effects can be ignored. It is important to remember that changing exchange rates can generate important employment effects which in some cases may be non-neglible.

2. A second issue is the substitutability of economic variables, since all these studies require an assumption about the relationship between imports (or exports) and domestic output. With a few exceptions the studies examined assumed that imports are perfect substitutes for domestic output. However, while this may be a realistic assumption for primary commodities the available evidence suggests it is much less plausible for most manufactured goods.

3. The input/output studies have the advantage of being able to capture the indirect employment effects of increased trade, which are generally significant. However all of these models suffer the familiar methodological drawbacks of their approach, not least of which are the difficulties of obtaining input/output tables for some countries and the fact that those available are usually outdated anyway. In addition, the static framework of the input/output studies, with its implicit assumption of fixed technological coefficients, is inappropriate for studying these effects of changing trading flows.

4. The accounting procedures also face formidable methodological problems. Clearly, the dependent variables determining employment change may be interdependent so that, for example, domestic productivity may have been stimulated by increased LDC competition. Secondly, exogenous factors may have been significant, such as LDC price competition which may well have increased domestic demand. Lastly, these estimates ignore the indirect employment effects on other industries supplying those which contract (or expand) their output.

5. For further details see J. Martin (1979) 'Measuring the Employment Effects of Changes in Trade Flows : A survey of recent research' and D. Schumacher 'The Impact of Trade with Developing Countries on Employment in Developed Countries' - UNIDO Working Papers on Structural Change, No. 3.

INDUSTRIAL ADJUSTMENT POLICIES

Economic Affairs Division
Commonwealth Secretariat

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Industrial Adjustment Policies

CONTENTS

I. Introduction

1. Protectionism is on the increase. The persistent recession and rising unemployment are the main reasons for the political pressures in industrialised countries which have encouraged protectionist policies. It is still widely accepted in official circles in these countries that the current problems facing the industrialised countries cannot be solved by protectionist 'beggar my neighbour' policies and that a resumption of reasonable levels of growth would depend on the continuation of the underlying post-war trend towards more liberal trading policies and a more open international trading system. However, governments have had to bow to protectionist pressures from sectors that have been particularly affected by contraction and labour displacement.

2. There is no doubt that social costs are involved in the situation where labour displaced by industrial change is not readily reemployed. Social costs are also involved in the depopulation and underutilised infrastructure which result from the deindustrialisation of particular regions. But such social costs, even in the short-term, are usually outweighed by the benefits from industrial change and movement to higher productivity and more capital- and skill- and technology-intensive industries. In such situations the benefits must be used to compensate and reduce social costs, if they will be allowed to arise. What are called for are positive adjustment assistance policies to facilitate change, rather than defensive policies to preserve 'lame duck' industries.

3. Unless such positive policies are adopted, the affected sectors will have to bear the full brunt of the disruption and this leads to the demand for protection. Positive policies are therefore vital to facilitate change and provide flexibility in the industrial structure. Even in a recession, when it would seem economically justified to prevent industries with long-term competitiveness from going to the wall, care is needed in the adoption of defensive policies which could prevent a shake-out of uneconomic industries, and a release of scarce resources e.g. of particular skills, both of which would help to sustain the recovery when it comes.

II. Defensive Government Intervention

4. OECD governments have attempted to ease the impact of structural pressures with industry incentives and subsidies to encourage new investment and upgrading of technology in declining sectors in the hope of regaining comparative advantage and avoiding labour redundancies. For most OECD countries, production subsidies as a proportion of GDP have shown a pronounced rise during the 1970's and are highly concentrated in sectors with least apparent growth potential, namely labour-intensive industries and mass production industries with standardised technology.

5. Evidence available suggests that this systematic bias towards protecting labour-intensive industries has been counter-productive to employment maintenance even in the short-run and has added to unemployment problems in the medium-term. Labour-saving investment in protected industries has led, despite increased production, to continued labour-shedding, often at average rates above those experienced in growth industries. Across all OECD countries for which studies have been undertaken, the proportion of structural unemployment which can be traced to import competition from developing countries is minor and has not justified defensive intervention aimed specifically at labour-intensive products from these countries. Indeed, these studies consistently suggest that the major sources of structural pressure originate from intra-OECD trade and technological change.

6. The outstanding common feature of defensive adjustment policy is the provision of 'temporary' assistance or 'breathing space' to slow or control the rate of adjustment. Yet costs are associated with slowdowns in the form of postponement of benefits and the costs of non-adjustment tend to increase over time. Nor is there any evidence to suggest that provision of a breathing space reduces costs to displaced workers. Wage subsidies embody disincentives to labour mobility, encourage inadequate emphasis on retraining and, to the extent that specific labour skills are scarce, contribute to labour hoarding and bottlenecks. Finally, protection raises the private rate of return on capital and, especially if subsidised finance is available, encourages new investment in relatively less productive industry and reduces incentives to scrap excess capacity. Attempts to improve efficiency by labour-saving innovations are likely to fail because if comparative advantage is based on labour and management skills, no amount of increased physical capital in production of standardised goods will improve competitive ability. Assistance to declining industries distorts factor and product markets for more dynamic companies, contributing to irrational investment allocation.

7. The need for a shift away from defensive policies to assist weak sectors and firms increases steadily with the passage of time, even under conditions of slow growth The output and prices of one firm are the input and costs of another: or the subsidies of one firm are the taxes of another, so that a proliferation of defensive measures leads to a progressive debilitation of industries and regions, and to a growing loss of international competitiveness.

8. There are other ways in which the pursuit of defensive policies will adversely affect employment by inhibiting investment. For example, increased profits in an industry which depends on government assistance for its survival are much less likely to stimulate productive investment than greater profits resulting from rising demand, and reflecting long-run competitive strength. Assistance to declining activities also tends to encourage inefficiency both at managerial and shop-floor levels. There is thus a vicious circle of slow growth generating behaviour and policies that impair productivity and accentuate inflation: this prompts governments to adopt more cautious demand management policies and hence leads, directly and indirectly, to even slower growth.

9. Defensive measures to assist weak sectors and companies create strong vested interests in their continuation. Thus 'controlled adjustment' very often turns out to be insufficient adjustment. Naturally, however, there is concern about phasing out defensive policies under conditions of high unemployment, and a shift to more positive adjustment policies, contributing to a revival of non-inflationary growth, thus has several important requirements for success. First, since adjustment is more difficult and painful under conditions of low growth and rapid inflation, governments must seek to achieve an overall economic climate conducive to growth and adjustment. Second, acceptance of adjustment presupposes the existence of effective arrangements for sharing the burden on those directly affected: redundancy payments, unemployment insurance, training programmes, assistance for moving etc. Third, acceptance of adjustment presupposes the existence of effective policies to deal with market imperfections and externalities - in particular, strong competition policies and strong regional policies.

10. This last pinpoints the major difficulty. In view of the degree of economic, financial and industrial interpenetration among developed countries, strong regional policies (for example in Western Europe) need to be international in scope, and strong enough to override national, defensive policies. Purposeful policies for regional development can be fully justified by the social costs of excessive industrial concentration, by the high cost of labour mobility from one region to another and by the desire to promote equality of opportunity and maintain regional, cultural and linguistic traditions. Since 1973, however, such policies have often been diluted by the increased emphasis given to short-term job maintenance programmes. There is also growing concern that under conditions of slow growth, the 'regional' label is being misused to justify policies which simply try to shift the employment problem from one place to another, at high cost. This underlines the need to pursue positive regional policies, based on: regionally differentiated fiscal and financial incentives and disincentives; public investment to provide economic and social infrastructure; manpower policies to increase the supply of skilled labour; and effective arrangements to prevent self-defeating competition between regions, both domestically and internationally.

11. Although competition from developing countries is a relatively minor factor among those creating a need for adjustment, exports to OECD countries are very important to them, and are often particularly vulnerable to defensive measures taken by the industrialized countries. Moreover, the impact of adjustment measures can vary significantly between the industrialized and the developing countries, due to differences in the scale and structure of their economies: smaller and less diversified economies are often more vulnerable to defensive measures taken by other countries than the more advanced economies. Many developing countries advocate a more direct and positive role for governments in planning and controlling industrial investment and production. They are making structural change and adjustment a central focus of the North/South dialogue, and are proposing a greater role for international surveillance and negotiations in this field. Further work on the trade aspects of such policies should, therefore, give appropriate attention to the interests of the developing countries.

III. Need for Positive Adjustment

12. The case for positive adjustment policies has been made out by the OECD[1]. Positive adjustment involves moving resources from the production of goods and services for which demand is declining to production of goods and services for which demand is increasing; from less efficient to more efficient production; away from production in which other countries are gaining a comparative advantage. Policies can be regarded as positive if they facilitate such shifts or, where they are directed to achieving other governmental objectives (such as improving the social and physical environment, the distribution of income, or the fair sharing of the burdens of adjustment), if they do so in ways which minimize adverse effects on economic efficiency.

13. One of the major recommendations made to member countries by the OECD was that they undertake what are called 'positive adjustment policies'. Big changes in relative prices, cost structures and patterns of demand since the early 1970s had made the need for adjustment in the structure of the OECD economies more urgent. At the same time, because of slow growth, high unemployment and a rise in structural rigidities, such adjustment had become more difficult, though by the middle of 1978 the OECD Council at Ministerial level had adopted some 'orientations' for a shift to more positive adjustment policies. Earlier, discussion of adjustment assistance had tended to be linked to problems arising from trade liberalization; but it was only a small step to a broader conception of the matter, focusing on the acceptance or promotion of developing country exports in general.

14. Yet another small step led to an even more general view, that structural problems in industrial economies were not primarily due to import competition: for the most part they arose from internal pressures which might or might not affect comparative advantage. Technical progress, new products, urbanization, and sectoral shifts were sources of structural strain which had in recent decades stimulated a growing list of regional and industrial policies. In such circumstance it would be difficult or meaningless to identify some industrial aids, manpower policies, or other measures as being specifically oriented to trade adjustment. The characteristic of industrial economies is incessant adaptation and adjustment to new conditions. This adaptation had not seemed to present any very great problem in the period of full employment and rapid expansion in the period following the second world war.

15. What above all prompted new thinking about a more active role and a more positive orientation for government in stimulating needful adjustment was the growth of unemployment. Year by year, starting from 1966 (in some countries a year or two earlier or later), the measured rate of unemployment in developed countries was rising. At each peak of economic activity there was a higher level of unemployment than existed at the peak of the previous business cycles. Also, when unemployment was high there were unfilled job vacancies, which were sometimes growing in the face of rising unemployment levels, and on each of the last three occasions when industrial economies had started moving out of recession, their rate of inflation had been higher than in the previous comparable period.

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1. The Case for Positive Adjustment Policies, A Compendium of OECD Documents, 1978/79. OECD, Paris, June 1979.

16. It appears that structural rigidities are a significant cause of the current inadequate growth performance of OECD countries and there is urgent need for a more positive government approach. Despite explicit recognition of this need by governments, positive adjustment policies have been considered difficult to implement in the recent context of slow growth and high unemployment. Implicit in this argument is an assumption that structural adjustment is likely to add to unemployment at a time when countercyclical policy is tuned to inflation targets and appears incompetent in correcting an already rising trend in unemployment. The orthodoxy continues that adjustment should be managed at non-disruptive rates and is excessively costly at times of slow growth. The view therefore has prevailed that governments must first seek to achieve an overall climate conducive to growth. It is clear however that the private costs of adjustment are lowest in periods of rapid growth and adjustment is more likely then to take place in the absence of government intervention. The converse implies that government intervention is most necessary in periods of lower growth when private and social costs diverge.

17. A vicious circle operates whereby government inaction, let alone defensive intervention, perpetuates structural rigidities which themselves impact unfavourably on countercyclical policy so that the growth recovery, and the awaited signal for the introduction of more positive policies, is only further postponed. The removal of negative measures, to the extent that downward pressures are exerted on the price level, may permit adoption of more expansionary policies by making it easier to reconcile growth and output expansion with price stability. The argument that governments should give contemporaneous attention to structural problems in order to 'restructure out of recession' is now gaining acceptance.

18. Policy should aim to minimise social costs of adjustment and redistribute the burden of private costs from displaced domestic factors. A positive approach to adjustment entails phasing out obsolete capacity and reducing or rationalising investment plans in structurally weak industries, encouraging investment in alternative directions likely to be consistent with future trends in international supply and demand and replacing existing measures which encourage retention of redundant labour in uncompetitive activities with action to improve labour mobility and productivity.

19. It is difficult to define ex ante a country's comparative advantage at detailed firm or subsector level. It is also difficult to label specific policy instruments as indisputably positive or negative as both the political feasibility and the likely impact of any particular instrument may vary significantly between individual countries. The recent experience of adjustment policies in OECD countries is reviewed briefly below.

IV. Manpower Policies

20. Current levels of unemployment have acted as major constraints on manpower policy, which generally has been directed to preservation of existing employment levels. Several governments require advance notice of intended retrenchments and make extensive use of employment subsidies, contributing as much as 75% and 70% in Sweden and the Netherlands, respectively, of the wage costs of firms employing surplus labour. Bankrupt firms are entitled under the Swedish scheme to grants up to half of total wage costs for as long as 12 months and government orders are placed with affected firms to postpone or extend the period of closure.

21. The Japanese government provides employment grants to firms with lifetime employment commitments involved in shifting permanent employees from low to high workload areas and to subsidiaries and associated firms. In the UK, employee representatives are vested with special rights in the management of redundancies and in France efforts are made to avoid redundancies via work sharing arrangements. Several countries including Australia provide subsidies for job creation for young people. Employment subsidies inflate wages in subsidised industries. Narrowing of wage differentials implies loss of signals to labour mobility, penalising growth and employment in alternative higher productivity sectors.

22. Further efforts are required to improve labour mobility via resettlement grants, rent subsidies, assistance with and protection against capital losses associated with sale of owner-occupied homes and travel allowances including for job search. Such schemes also reduce the cost to firms of hiring new labour. Minimum wage, payroll tax and equal pay legislation, economy-wide wage negotiation and job security provisions contribute to increased marginal labour costs, reinforcing the tendency, in the context of hesitant growth recovery, to forgo expansion rather than carry additional labour and thus helping to concentrate unemployment among transitory workers and new entrants to the labour force. Subsidies to employment in declining industries could be replaced by general schemes providing tax credits for specially disadvantaged categories of labour across all industry branches, thereby reducing hiring costs of employers in a non-discriminatory fashion. The tax rebate for full time apprentice training in Australia is an example of such a scheme, complemented by financial support to pre-apprenticeship training on-the-job available for all school-leavers unable to obtain apprentice employment. Training and re-training especially on-the-job could be advantageous. Nevertheless, training is inefficient if provided on-the-wrong job. In the UK, on-the-job training is financed by a levy on firms with exemptions provided for small businesses and firms which themselves make adequate training provisions. In Europe the trend is towards grants or tax deductions in favour of joint-firm and group training arrangements.

23. Lump sum compensation payments seem preferable to income maintenance benefits as a means of reducing the private costs of adjustment to redundant workers. Compensation payments which are not wage-related and not conditional on non-re-employment may have added advantages in that they do not delay exit or affect work decisions after redundancy, are available with minimum administrative procedure and assist immediately in reducing costs involved in job search. In the UK, lump sum compensation payments may be 50% refunded from a Redundancy Fund to which employees themselves contribute.

Obstacles to mobility continue to arise from non-transferability of seniority rights and pension entitlements and further consideration could be given to measures both to promote full vesting of pension rights and to reverse taxation biases favouring superannuation over private savings programmes.

V. Industry Policies

24. All direct instruments of industry policy - tariffs, quotas, subsidies, assistance to small business, trade practices legislation, pricing scrutiny, R & D and regional development funding - can be made more or less specific to particular industries. The general tendency has been, with the exceptions of the Netherlands and until more recently of Japan which pursued comprehensive forward planning, to intervene via selective or discriminatory measures assumed to be cheaper and more efficient since targeted to particular industries. The USA, Japan and West Germany have resisted excessive increases in subsidies to specific industries; France, Italy and the UK have not.

25. Adjustment assistance is also commonly provided for industries specifically affected by changes and developments in government policy, such as the Kennedy Round in 1968, the adoption of a Common External Tariff by the EEC, the Canadian-American Automobile Agreement of 1965 and the 25% across-the-board tariff cut in Australia in 1973. A major draw-back inherent in trade-related programmes is that unless industries are precertified eligible for assistance, time-consuming analysis is required to determine, for each applicant, the cause of structural displacement, resulting in delays and uncertainties in assistance. Inequities also arise as benefits discriminate in favour of factors affected only during a pre-determined period by a particular source of structural pressure. In the Australian experience, tariff reduction followed by very delayed ex-post compensation was considered to have undermined business confidence and adversely affected investment.

26. Adjustment assistance to industry is typically provided via capital grants, loans and loan guarantees, interest subsidies, tax concessions or, on a last resort basis, special legislation to allow merger or nationalisation. This assistance has rarely been made conditional on diversification, nor have efforts been made to restrict defensive investment aiming at factor intensity reversal. To encourage positive adjustment and scrapping of excess capacity, direct financial incentives are required, conditional on such scrapping, in the form of compensatory cash grants or subsidised long-term loans.

27. The UK, Netherlands and Japan have some experience in underwriting contraction via compensation payments. In Japan, iron and steel, shipbuilding, aluminium refining and synthetic textiles receive tax credits for reductions in total capacity and scrapping of least-efficient units. In the Netherlands, all selective subsidies have been replaced with a general investment account; tax credits are allowed up to 30 per cent in the case of special investments meeting employment, regional energy and pollution control objectives. In Sweden, firms may appropriate profits, untaxed, to an internal fund for nationally desirable investments, at times suited to overall economic management. The new Canadian Enterprise Development Programme provides a general framework for government anticipation of trade-related change. It provides loans, loan assurances and equity participation in restructuring or rationalisation activities when viable future prospects are identified. Compensation or abandonment assistance is not provided nor is temporary support for declining industries.

28. Trade-related assistance could also be undertaken in conjunction with certain forms of industry-specific intervention.[1] Assistance triggered both by liberalisation or injury on application would cover both precertified industries and individual firms, ensuring that no affected factors 'miss out', that treatment is consistent across industries, and that individual applications provide an early warning system for further structural pressure. Cumbersome identification of the precise source of change in declining industries would also be avoided. As such programmes could prove expensive for small open economies, assistance could be restricted to small firms, worst-affected factors and developing country import competition only. The Netherlands provides subsidies specifically to assist adjustment to developing country imports; the eligibility criteria are very restrictive however; at the end of 1978 total commitments were well below the sums appropriated due to lack of applications, and the scheme is under reconsideration.

29. There is some evidence that it is small businesses which are first and hardest hit by structural changes and, given distortions in capital markets and heavy reliance on retained earnings and shareholders funds, the least able to finance innovative adjustment. Adjustment policies should therefore be designed to meet the needs of small businesses. In Canada and the US advisory services are offered to small business at nominal cost under retired business executive programmes. In Germany contributions to management consultant fees are available and in Canada, Sweden, Germany and the US R & D programmes are specially designed for small business. Much of the import competition faced by small business in Japan derives from offshore subsidiaries of larger Japanese firms. Small businesses are provided with low-interest loans and tax relief in depressed areas when co-operating with government directives in scrapping plant and equipment or shifting to new lines of production. In practice however, it is the relatively larger of the small firms which profit under these arrangements.

30. In Canada, Australia and Japan, government financial institutions have special responsibilities to lend to small businesses. In Australia, trading banks have been advised to review their lending criteria to ensure adequate provision of small business finance and regulations regarding taxation of retained earnings of private companies have been relaxed. In the UK and the US specialist organisations provide small business development finance, risk capital, funds and facilities for leasing and plant purchase, and financial advice on mergers, take-over bids and the stock exchange. Major fiscal incentives are provided in the US for venture capital and small business investment; Canada has initiated public sponsorship of privately operating venture capital institutions and the largely government-owned Canada Development Corporation has taken up minority equity positions in several such corporations. In view of the share of small business in industrial employment, its role in innovation and competition and the particular obstacles it faces in undertaking adjustment in times of inflation, further encouragement of venture capital activity would seem desirable. Similarly trade practices legislation should not impede mergers and takeovers which are likely to improve efficiency. In Japan and West Germany, adversely affected firms are able to form 'rationalisation' or 'structural crisis' cartels for specified periods of time which have, in most instances, been extended.

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1. See "Adjustment Policies and Problems in Developed Countries," World Bank Staff Working Paper No. 349, August, 1979.

VI. Positive and Anticipatory Policies

31. OECD governments have generally avoided forward industrial planning to induce structural changes on the basis that governments are unlikely to be more competent than the market in picking winners and therefore the allocative role of the latter should be supplemented only for long-term, high-risk ventures involving production of non-market goods or requiring high-technology. Some countries give assistance on an adhoc basis targeted to industries or companies thought either to have a particularly promising future or considered to be "at the margin" of economic viability. By engaging in selective intervention of this kind, governments are implicity making judgements about future production structures and it would seem useful to improve medium-range forecasting of industry prospects with a view to developing early warning signals of structural weakness and potentially disruptive structural pressure. In Germany, several independent Economic Research Institutes report directly to the government on trends in structural change. France, Italy and Japan construct detailed indicative plans to guide public sector investment; government banks or credit institutions also play an important role in these countries as well as in Germany in directing private investment.

32. Japan and the Netherlands apply strategies aiming explicity at transformation of domestic supply structures in line with shifts in comparative advantage. Japanese policy is to concentrate on developing industries with relative human capital intensities, abandoning or relocating offshore those with labour and physical capital intensities. Every year since 1975 the Ministry of Industry and Trade (MITI) has prepared a five-year rolling plan roughly projecting the structure of production, demand, investment and employment, along with government measures to achieve projected annual "targets". Administrative guidance rather than government funding is used to smooth the changes envisaged under forward planning. A major instrument is informal persuasion of commercial banks to provide loans to certain sectors and even certain firms and to curb lending for investment in industries listed by MITI for phase-out. Incentives to scrap unprofitable equipment include low-interest conditional loans and guarantees, numerous fiscal incentives for investment contributing to quality of life, accelerated depreciation allowances for priority industries, direct subsidies and installation of special loss reserves for overseas exploration of mineral resources, and a package of tax and financial assistance for development of energy and resource-saving technologies. Protection and subsidy techniques are applied sparingly to high-technology, high value-added or high income-elastic products where large new markets are foreseen.

33. There is considerable scope for improving the "transparency" of policy objectives and consequences, since aspects of government activity, including stabilisation and regional development policy, have an impact on business confidence and labour unrest. The need for government intervention to induce balanced regional growth, for example, is itself indicative of structural rigidities in the labour market. If differences in the inter-regional demand for labour are not reflected in regional wage differentials, then in order to maintain employment, explicit subsidization of labour is required to offset consequences of labour immobility. Meanwhile the impact of structural

pressures and the political resistance to change frequently have a strongly regional dimension. The rapid decline of regionally concentrated industry may have a dramatic effect upon a particular region, especially if that region already has below-average employment and income levels. There is a clear need for proper co-ordination between policies legitimately aiming to achieve balanced regional development and selective industrial policies designed to meet other objectives in specific regions.

34. Special incentives are typically provided, usually to investment, but increasingly to employment, for firms locating in depressed areas. These include provision of infrastructure, reductions in local taxes, removal grants, transport and freight assistance and land-use planning to prevent development in alternative regions. These measures may attract weak firms seeking to lower costs under pressure of import competition; regional incentives should be applied with discretion to prevent further concentration of vulnerable industry in the depressed region.

35. None of these measures compensate for regional inequalities in endowments of the skilled human capital factors on which the comparative advantage of industralised countries is based. It is futile to subsidise the location of physical capital alone as viable long-run employment for unskilled labour in these regions can only be created by encouraging combination with skilled labour resources. Industry policies aimed at improving regional balance should be complemented by policies to improve geographic mobility of highly skilled labour.

36. It is imperative that governments recognise the indirect impact of regional and other policies on production and employment structures, and consider more integrated long-run approaches to industry policy formulation providing unambiguous guidance to investment. The extent to which tariff reductions need to be accompanied by adjustment assistance is clearly less, the slower the rate of tariff reduction and the greater the flexibility of other policies in assisting affected individuals and firms. The availability of general retraining and relocation facilities which operate in an anticipatory manner reduces the need for income maintenance payments, just as assistance requirements of firms are reduced to the extent that the capital market and tax system operate effectively to facilitate structural change.

37. As long as adequate rational assistance remains unavailable for firms adjusting to trade-related shifts in competition, the inequities in private costs and benefits associated with restructuring will promote resistance to adjustment and encourage lobbying for protection. Adjustment assistance programmes need not be expensive, as the successful and very budget-conscious Japanese approach exemplifies. Nor are these programmes likely to be expensive relative to current levels of subsidy to declining industries; various analyses of UK practice indicate that compensation may frequently have been considerably cheaper in terms of absolute commitments. Finally, the opportunity costs of continued protection and defensive industry policy are enormous, undermining the dynamic processes generating rising productivity and hindering achievement of non-inflationary growth.

NOTES ON SOME PROJECTIONS OF ENERGY SUPPLY AND DEMAND

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Notes on Some Projections of Energy Supply and Demand

CONTENTS

I. Introduction

1. A great many studies involving projections of global energy supply and demand have been made since the oil crisis of 1973-1974. These notes summarize the conclusions of three of the most comprehensive and authoritative long-term projection studies (those of the World Energy Conference (WEC) 1977, the Workshop on Alternative Energy Strategies (WAES) 1977, and the OECD Interfutures project, 1979) and comment briefly on several of the other ones.

2. Before doing so, however, it may be useful to point out that of the eighty or so studies undertaken since 1973, the projected increases in world demand for energy are significantly lower in the later studies than in those compiled earlier. This reduction is partly because of a lowering of expectations as to future rates of economic growth, and partly as a result of a reduction in the energy/GDP coefficient caused by greater conservation related to increased prices of energy, technological improvements and structural change. The projected rates of increase in the supply of energy have also tended to decline through time, mainly because of the greater emphasis being placed on production restraint by governments of the major oil-exporting countries.

3. The more recent preoccupations with supply have not been reflected in the WEC and WAES studies, the practical utility of whose conclusions might well be considered as having been vitiated by their assumptions of a continuation of earlier policies on oil production by governments of the major oil-exporting countries and on oil price rises to the end of the century and beyond (by the end of 1979 actual prices of oil were already above levels assumed for the end of the century in some of the projections). Despite its more recent publication, the Interfutures project suffers from similar limitations, particularly on oil price assumptions.

4. In fact none of the long-term projections of global energy supply and demand yet published takes full account of the recent sea-change in the oil supply and price situation. The US Central Intelligence Agency published a study in July 1979 which did take account of the changed Iranian situation, but its projections were only until 1982 and it focused on the oil supply prospects for OECD. Even the most recent OECD Economic Outlook, of December 1979 and covering the year 1980, was compiled before the extent of the most recent oil price rises was known. The National Institute of Economic and Social Research (NIESR) (London), in its November 1979 review, covered a longer period(1980-1985), but whilst it was able to take full account of the changed oil supply situation in terms of availabilities, it too was published before the oil price increases announced towards the end of 1979.

5. The major published studies also suffer from other limitations. WAES, for example,does not cover the centrally-planned economy countries (CPEs), while WEC assumes this group will remain self-sufficient. Yet evidence from the CIA and other sources suggests that the CPEs of Europe will become increasing net importers of oil during the 1980s as the great fields of Western Siberia become depleted. Interfutures does not attempt an an independent projection of global energy supplies.

6. The studies whose results are summarised below differ significantly in their assumptions as well as in their quantitative projections of energy supply and demand. However, there are some crucial conclusions which they share. The studies suggest that 'new' and unconventional sources of energy, such as solar energy and fast-breeder reactors, are unlikely to make a major commercial impact before the end of the century; as such, and assuming that the rate of exploitation of 'conventional' oil resources is not likely to increase substantially, the main possibilities of increasing energy supplies would be through greater production of coal and an expansion in that of 'conventional' nuclear energy. Even so, most projections suggest that energy supplies are likely to constitute a constraint on economic growth possibilities in the 1980s and perhaps to the end of the century. The realisation of even modest growth targets will therefore require considerable efforts at energy conservation and restriction. However, looking beyond the end of the century, given adequate investment in technology and resource development, there would seem to be no physical constraints to the expansion of energy production and thus to the possibilities for economic growth.

II. World Energy Conference

7. The WEC has seventy-six member countries from the developed, developing and centrally-planned economy countries. It collects and publishes data on the potential resources and means of production, transportation, transformation and utilisation of energy, as well as on the relationship between energy consumption and economic growth. Conferences on these matters have been held since 1924, the most recent being in Istanbul in September 1977; the next one is scheduled for Munich in September 1980.

8. One of the main arms of the WEC is the Conservation Commission, established in 1975 to evaluate, for the period 1985-2020, primary energy supply prospects and to determine possible courses of action toward overcoming potential shortfalls in availability, with particular attention to oil and gas. Three study groups were established by the Commission - on resources, conservation measures, and demand. The groups were assisted as necessary by studies commissioned to consultants. One of the major studies was that on "world energy demand to 2020" undertaken by the Energy Research Group from the Cavendish Laboratory of Cambridge University.(1)

9. The principal conclusions of the Conservation Commission,(2) which were accepted by the 1977 Istanbul Conference, are as follows :

i) during the period 1975-2020 world demand for energy, and thus economic growth, would have to adjust to whatever supplies of energy were available ;

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1. "World Energy Resources 1985-2020 : World Energy Demand to 2020" by I.J. Bloodworth et. al., IPC Science and Technology Press, 1978.

2. "World Energy : Looking ahead to 2020", edited by I. Berkovitch for the Conservation Commission of the World Energy Conference, IPC Science and Technology Press, 1978.

ii) the maximum potential global supplies of energy in the year 2020 were put at 1,000 exajoules (EJ) (1), implying an average annual rate of increase between 1975 and 2020 of 3 per cent (see Table 1) ;

iii) attaining such a rate, however, would entail major efforts in all energy resource fields, including the discovery and development of major oil and natural gas deposits (necessarily in increasingly difficult physical situations), the tripling of coal production, the doubling of nuclear power plant capacity every half-dozen years, and the use of solar energy on a scale and at a growth rate which is unprecendented ;

iv) these efforts would require greatly expanded investment, technology transfer, technical training and R & D in the requisite production, transportation and marketing facilities, together with the appropriate social and political conditions. In view of the long lead times in constructing energy facilities, concerted government action was needed without delay ;

v) resources of 'conventional' oil, together with projected discovery rates, are such that global production is expected to peak at about 220 EJ around 1990, fall to 175 EJ by 2005 and to 105 EJ by 2020. This means that by the year 2000, 'conventional' oil production would be sufficient to meet world demand only if the bulk of that demand were to be reserved for specific premium uses, such as transport and chemical feedstock, and use in heating and power generation were to be greatly limited ;

vi) supplies would, however, be augmented by 'non-conventional' oil, whose production potential could reach a level of 40-50 per cent of that of 'conventional' oil by 2020, given the requisite incentives ;

vii) resource availabilities are not as constraining a factor for natural gas as for oil, but they do mean that the global production potential is expected to peak in the year 2000, at over 140 EJ, and fall to some 115-125 EJ in 2020; by that year, 'non-conventional' sources could add a further 15 EJ to potential supplies ;

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1. One exajoule = 10^{18} joules. (A joule is the standard scientific unit for measuring energy; it is defined as the energy dissipated in one second by a current of one ampere flowing across a difference of one volt). One exajoule is approximately equivalent to 160 million barrels of oil (0.45 million barrels of oil per day) or 22.7 million tonnes of oil or 34.5 million tonnes of coal.

viii) resources of coal are abundant and, with advancing extraction technologies, recoverable reserves are sufficient for almost two centuries of supply at the most demanding rates, including those for conversion to synthetic oil and gas ;

ix) world production of coal is projected to increase by 2.7 per cent annually to 2020, in line with total output of energy. Provided economic conditions are favourable, output could increase at a faster rate ;

x) production of uranium for nuclear power generation will peak around 1990 at a level some four times its 1975 total unless new resources are identified and developed; but as under certain assumptions it is projected that requirements for uranium by 2020 would be around fifteen times those of 1975, it is likely that even if such discoveries were made, nuclear power generation would continue to be constrained unless considerable advances are also made in fuel utilisation technology and fast-breeder reactors are introduced on a large-scale from about 1990 ;

xi) the existing potential of hydraulic resources and the capacity of facilities under construction or planned indicates that the probable annual average amount of energy available from hydro-electricity facilities will more than double between 1975 and 2000 and quintuple between 1975 and 2020. This means that hydraulic resources would continue to account for around 5 per cent of total supplies of energy but would provide a diminishing proportion of that of electricity (23 per cent in 1975 and 16 per cent in 2020). By 2020 it is likely that some four-fifths of the world's hydraulic resources will have been harnessed, and development thereafter will be much slower ;

xii) given adequate technological progress, production of solar energy could increase from its current insignificant level to a range of some 25-75 EJ by the year 2020 (2.5-7.5 per cent of total supplies); it is probable that around four-fifths would consist of solar energy for heating and cooking ;

xiii) it is likely that geothermal resources will play an increasing role in world energy supplies and by 2020 could be providing around 40 EJ of energy (4 per cent of the total) ;

xiv) the resources base for the fusion fuel cycle is practically limitless, but the state of technology for converting the resources into energy is such that no reliable estimate can be made of when the process will become economic except to state that by 2020, on optimistic assessments, it may just be reaching the demonstration stage ;

xv) on the demand side the Commission considered that an average annual increase of 3 per cent in the potential supplies of energy, to 1,000 EJ in 2020, could be consistent with economic growth from 1975 to 2020 maintaining its 1960-1975 pace, of around 4.2 per cent per annum in OECD, 3.3 per cent in the CPEs and 5.7 per cent in the developing countries (LDCs) (see Table 2) ;

xvi) this conclusion , however, was dependent on three assumptions; viz. that during the period (a) the income elasticity of demand for energy declined from 0.8 to 0.4 in OECD and from 1.3 to 0.9 in LDCs, (b) the price elasticity of demand for energy was -0.4 in OECD and -0.3 in the LDCs, and (c) the CPEs remained self-sufficient in energy ;

xvii) reducing the income elasticity coefficients in this manner, partly as a result of a response to energy price increases and partly as economies matured, would mean the saving of almost half of the energy that otherwise would have been used by the year 2020. Three-tenths of this saving would be effected through technological improvements and one-sixth through structural changes ;

xviii) a successful global energy strategy would need the following elements

- maximum production of non-renewable 'conventional' energy resources (coal, oil, gas and fissile materials) ;
- significant development of 'non-conventional' oil and gas resources ;
- timely development of renewable energy resources (hydro, solar (including biomass), geothermal and fusion) ;
- enhanced conservation through the more efficient utilisation of energy ;
- increasingly extensive substitution of coal and nuclear energy resources for oil and (later) gas ; and

- suitable arrangements between energy supply industries and governments to provide adequate capital for the large-scale and costly capital investment programmes required ; and

xix) the timing of such a strategy is crucial, and decisions to implement programmes of expanded energy production and of enhanced conservation of demand must be made promptly : a delay of ten years (to the latter part of the 1980s) would precipitate a global energy deficit and consequent crisis before the year 2000.

III. Workshop on Alternative Energy Strategies

10. The WAES consisted of a group of over seventy-five leaders of commerce, industry, government and academia who for two and a half years from October 1974 studied energy supply and demand, and assembled a set of 'global'(1) and national integrations for the period 1977-2000.(2) The participants in the Workshop, together with their associates, were assisted in their task by a secretariat from the Massachusetts Institute of Technology.

11. WAES adopted a 'scenario' approach to their model building, specifying the assumptions made for key variables such as 'world'(1) economic growth, 'world'(1) oil/energy price, national policies toward energy, oil discoveries and production limits, principal replacement fuels for oil, etc. The scenarios chosen were not forecasts but simply plausible versions of possible futures, leading to different estimates of maximum potential supplies of and desired demand for primary energy. The period under examination was divided into two parts : 1977-1985, in which the contribution of each primary energy source was already largely determined by existing infrastructures; and 1985-2000, when alternative energy supply systems and conservation measures could make major contributions.

12. The major conclusions of the study are as follows :

i) the supply of oil will fail to meet increasing demand before the year 2000, most probably between 1985 and 1995, even if energy prices rise 50 per cent above their 1975 levels in real terms ;

ii) demand for energy will continue to grow even if governments adopt vigorous conservation policies. This growth must be satisfied increasingly by energy resources other than oil, which will be reserved progressively for uses which only it can satisfy (e.g. chemical feedstocks) ;

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1. The WAES concept of 'global' and 'world' was the 'World Outside Communist Areas' (WOCA).

2. "Energy : Global prospects 1985-2000", Report of Workshop on Alternative Energy Strategies directed by Carroll L. Wilson of M.I.T., McGraw-Hill 1977; and three Technical Reports, M.I.T. Press, 1977.

iii) continued growth of energy demand requires that energy resources be developed immediately with the utmost vigour. The alternatives take 5-15 years to develop and the need for replacement fuels will increase rapidly in the last decade of this century ;

iv) electricity from nuclear reactors can make an important contribution to global energy supply but has yet to be accepted on a large-scale. Fusion power is not expected to be significant before 2000 ;

v) coal has the potential to make a substantial contribution to global energy supply : reserves are abundant, but taking advantage of them requires an active development programme by both producers and consumers ;

vi) natural gas reserves are large enough to meet projected demand, provided incentives are sufficient to encourage the development of extensive and costly inter-continental gas transportation systems ;

vii) although the resource bases of other fossil fuels, such as oil sands, heavy oil and oil shales, are very large, they are likely to supply only small amounts of energy before 2000 ;

viii) renewable resources of energy, other than hydro-electric power, are unlikely to contribute significantly to energy supplies this century, although they could be of importance in particular areas; they are likely to become increasingly important in the next century ;

ix) energy efficiency improvements, beyond the substantial energy conservation assumptions built into the WAES analysis, can further reduce energy demand and narrow the prospective energy gap ; and

x) the critical interdependence of nations in the energy field requires an unprecendented degree of international collaboration, notably the will to mobilise finance, labour and R & D with a common purpose never before attained in peace-time; moreover, this collaboration is required now.

The range of projections of energy supply and demand, as determined by WAES, is set out in Table 3.

IV. Interfutures

13. The OECD Interfutures project,(1) which ran from 1976 to 1978, was undertaken in order "to provide OECD member governments with an assessment of alternative patterns of longer-term world economic development in order to clarify their implications for the strategic policy choices open to them in the management of their own economies, in relationships among them, and in their relationships with developing countries."(2)

14. The project analysed prospects, constraints and issues in the longer-term perspective, with particular attention to such subjects as the physical limits to growth, the interaction between growth, structural adaptation and value changes, and the relationships between the policies and progress of developed and developing countries. It adopted a 'scenario' approach, adopting four basic scenarios differentiated according to level of economic growth and type of economic management. Among the issues on which the project concentrated was the extent of the problems which will be faced during the transition from an energy system dominated by oil to one in which other fuels will have to play a growing part, and how these problems might best be overcome.

15. The first consideration in this process was an examination of the physical limits to growth. The report concluded that "energy resources should be sufficient to meet in the long-term, and on a regular supply basis, world consumption levels which will be ten to fifteen times higher than that of 1975, at costs which over the period are not more than twice or three times as high as production costs in 1978."(3) Drawing heavily on estimates of the WEC, the report considered that resources of oil, natural gas, coal, uranium and thorium, in aggregate could not provide a long-term solution to energy demand but that, eventually, renewable sources of energy, particularly nuclear energy, would provide such a solution.

16. The problem would be in overcoming the period of transition which would be of the order of half a century at least and be marked by great uncertainties. This is the period during which oil production will peak and then decline but before the new forms of renewable energy are available on a large-scale. Because of the size and complexity, and therefore cost, of energy systems, the pattern of supply of and demand for the different fuels can change only slowly. It is the decisions taken before 1985 which will be of crucial importance for the development of the energy situation during the first quarter of the next century. The only decisions which can have any major influence on the energy situation before 2000 are those to (i) implement energy saving policies, (ii) expand nuclear energy plants, and (iii) increase coal production.

17. Superimposed on these global considerations are problems resulting from the uneven distribution of resources, particularly of oil, and the resultant geopolitical tensions. Problems of this nature seem likely to be of growing significance during the transition period.

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1. Interfutures : "Facing the future - mastering the probable and managing the unpredictable", OECD, 1979.
2. Ibid, page iii.
3. Ibid, page 26.

18. An assessment of energy supply potential is only meaningful when related to prospective energy demand, on which the Interfutures project made the following assumptions : that the ratio of energy consumption to GNP would decline (in the case of the OECD countries from 0.8 in 1975 to 0.6 in 2000 for scenarios A, B2 and B3, and to 0.6 in 1985 and 0.5 in 2000 for scenario B1; in the case of the developing countries from 1.4 in 1975 to 1.0 in 2000 for all scenarios); and that the long-term price elasticity of demand for energy is far from negligible, a significant reduction in energy consumption in OECD being possible with only a small relative decline in national income.

19. Application of the various scenario assumptions resulted in a wide range of projected increases in energy consumption between 1975 and 2000. Details are given in Table 4.

20. The authors of Interfutures commented on the results obtained in the following terms :

Scenario A : Sociopolitical rather than physical limits might prevent realisation of this scenario owing to the need for great investment in oil exploration and development and in coal production, as well as the environmental problems holding back the development of nuclear energy and the need to adopt simultaneous policies on conservation and on developing alternatives to oil.

Scenario B1 : Energy supply problems remain, as almost all the projected 15 per cent reduction in demand compared with that in Scenario A is assumed to come from a halting of development of nuclear energy production. Market pressures on fossil fuels are therefore unchanged, and despite strict conservation measures, an energy crisis due to the depletion of oil resources remains a possibility.

Scenario B2 : Less opposition to nuclear energy allows retention of higher coefficients of energy demand to GNP.

Scenario C : OPEC supply policy leads to a doubling of the 'real' price of oil between 1978 and 2000 and to a favouring of the 'South'. Total demand is put at a level 28 per cent below that in Scenario A, the bulk of the decline occurring in OECD whilst that in the developing countries is only moderately lower (16 per cent).

Scenario D : Protectionism leads to a realignment of energy trade flows. Total demand is put at about the same level as in Scenario B1 but that in OECD is rather higher and in other countries (in aggregate) rather lower.

21. The main conclusions of the report - as regards energy - are as follows :

i) the development of nuclear energy is essential during the transition to the post-oil era; there is no longer time to organise a type of development which consumes little energy and is socially harmonious ;

ii) the development by OECD of a common coal policy will considerably reduce the risk of an energy crisis. Coal will have to play a major role in energy supply from 1985 ;

iii) energy conservation policies can have significant effects but need to be formulated in a long-term perspective and applied consistently and vigorously ;

iv) because of the length of the transition period, vigorous measures should be taken promptly to develop new forms of energy or new sources of the same fuels ;

v) enhanced cooperation should take place among the oil-importing countries on the implementation of the above policies ;

vi) OECD should also seek better cooperation with OPEC in order to encourage that group to adopt a more positive attitude toward undertaking the necessary amount of research and investment to maintain an exportable surplus of oil, which would benefit developed and developing countries alike ; and

vii) OECD should provide technical and financial assistance to developing countries (either directly or through international organisations) in order to help them to exploit their fossil fuel resources and to obtain nuclear energy when their level of energy consumption or situation so warrants; it should in addition cooperate with them on the production of new sources of energy, particularly biomass; consideration should also be given to how to guarantee these countries a certain supply of oil (or the means to obtain that supply) in case of shortage.

V. Other studies

1. Organisation for Economic Cooperation and Development

22. In 1977 the OECD published a study on the "World Energy Outlook". This was a revision and extension of its earlier study on "Energy Prospects to 1985" and contained a reassessment of energy prospects for the world to 1985 and of the OECD region to 1990 and beyond. The study was undertaken on a scenario basis, with the object of assessing what quantities of energy should be needed to fulfil given rates of economic growth for particular groups of countries, from which the necessary levels of global energy production could be calculated. It assumed that oil supplies for export from OPEC would match the potential demand for OPEC oil, although recognising that in practice not all OPEC members would necessarily always produce to capacity.

23. The study concluded that a continuation of present policies governing energy supply expansion and conservation would produce by 1985 a close and uncertain balance between importing countries' demand for oil imports and exporting countries' prospective oil production. The uncertainties of the latter led the authors of the study to propose an immediate further examination of the measures necessary to increase OECD output of oil and to conserve its consumption in order to hold down net imports. They estimated that prompt action through "accelerated policy measures" could save up to 30 per cent of OECD countries' net oil-imports by 1985. The main statistical components of the supply - demand position through to 1985 are given in Table 5.

2. National Institute of Economic and Social Research

24. The NIESR Economic Review of November 1979 included a short-term forecast for 1980 of the effect of the oil price rises on GDP within OECD, and a medium-term forecast through 1985 which assessed the increase in the supply of oil necessary to maintain economic growth of 3 per cent per annum in the industrialised countries and an annual rise of 6 per cent in the oil demand of the non-OPEC developing countries. It assumed that the oil targets agreed at the 1979 Tokyo Summit Conference would not be met in all cases, that the Comecon countries would cease to be net exporters of oil by 1985, that all the 'easy' energy conservation measures had been taken, and that there were few possibilities for the substitution of other fuels for oil until nuclear energy production began to increase rapidly.

25. Application of these and other assumptions led the NIESR to calculate that fulfilment of the above objectives would require an increase in OPEC oil-exports of 2 per cent per annum from 1979 to 1985. Whilst it was considered that the OPEC members were fully capable of such an increase the problem was to assess their willingness to do so. Another difficulty was to assess the movement in oil prices relative to those of other products (e.g. an index of the average unit value of manufactured exports).

26. NIESR concluded that it was not possible to determine with any assurance whether economic growth outside the CPEs would be constrained in the medium-term by energy supplies; but whilst it appeared that a 3 per cent growth rate in OECD was possible, any return to higher rates would become energy-constrained unless vigorous and successful new conservation measures were taken. The projections of the demand for and supply of oil, on which these conclusions were based, are given in Table 6.

3. United States Central Intelligence Agency

27. The CIA study of July 1979 on the "World oil market in the years ahead" focused on the oil supply prospects to 1982 for OECD countries (excluding Australia and New Zealand). It concluded that under the assumptions made, energy demand in OECD would exceed available supplies at all rates of economic growth above 2 per cent per annum if OPEC were to produce at what the CIA judged to be the oil producers' 'preferred levels'. Even if OPEC were to produce at projected maximum capacities, the CIA concluded that energy demand would exceed supplies by 1982-1983 if the OECD economic growth rate exceeded 3 per cent per annum. The solution was swift government action to enhance energy conservation measures and thus reduce the energy/GDP ratio by 2 - 2.5 per cent annually.

Table 1

Potential world production of primary energy, 1972-2020

exajoules (per cent)

	1972	1985	2000	2020
Oil	115 (43)	216 (44)	195 (28)	106 (11)
Gas	46 (17)	77 (16)	143 (21)	125 (12)
'Unconventional' oil and gas	- (-)	- (-)	4 (-)	40 (4)
Coal	66 (25)	115 (24)	170 (25)	259 (26)
Nuclear	2 (1)	23 (5)	88 (13)	314 (31)
Hydro	14 (5)	24 (5)	34 (5)	56 (6)
Solar, geothermal, wood, biomass	26[a] (9)	33 (6)	56 (8)	100 (10)
Total	269 (100)	488 (100)	690 (100)	1,000 (100)

a Consists almost entirely of 'non-commercial' energy - wood fuel, dung, vegetable waste, etc.

Source: WEC Conservation Commission, 1977.

Table 2

Potential world demand for 'commercial' energy, 1972-2020

exajoules (per cent)

	OECD	LDCs	CPEs	World
1972	150 (62)	27 (11)	66 (27)	243 (100)
1980	178 (57)	46 (15)	86 (28)	310 (100)
1990	212 (51)	86 (20)	120 (29)	418 (100)
2000	242 (43)	152 (27)	167 (30)	561 (100)
2010	262 (35)	253 (34)	233 (31)	784 (100)
2020	278 (28)	397 (40)	325 (32)	1,000 (100)

Source: WEC Conservation Commission, 1977.

Table 3

Range of potential energy supply, demand and balance, 1972-2000

(million barrels per day, oil or oil equivalent)

	OECD[a]	Non-OPEC LDCs	OPEC	World[b]
1972				
Supply	40	5	27	74
Demand	58	6	2	69
Balance	-18	-1	+25	+5
1985				
Supply	55-69	12-15	42-46	112-127
Demand	78-104	15-18	4-5	102-138
Balance	-11 to -48	-3	+37 to +41	-15 to +10
2000				
Supply	73-93	20-32	51-61	154-191
Demand	115-143	27-38	8-14	160-207
Balance	-42 to -50	-6 to -7	+43 to +48	-6 to -15

a Excluding Australia and New Zealand.

b Outside Communist areas; includes bunkers.

Source : 1972 - UN World Energy Supplies
1985,2000 - WAES, Third Technical Report, 1977.

Table 4

Demand for energy in 1975 and 2000

(million tonnes of oil or oil equivalent)

	World	Developed	Developing	Centrally Planned
1975	5,606	3,481	440	1,685
2000				
Scenario				
A (high growth)	14,622	7,022	2,736	4,861
B1 (moderate growth)	12,449	..	..	..
B2 (structural difficulties)	13,180	6,021	2,388	4,771
C (north-south rift)	12,002	4,847	2,291	4,864
D (protectionism)	12,434	5,668	2,223	4,543

Source : OECD, Interfutures.

Table 5

Projected energy production, requirements and net trade, 1974-1985

(million tonnes of oil or oil equivalent)

	1974	1980	1985 [a]	1985 [b]
Production				
OECD	2,260	2,708	3,295	3,579
Other developed	51	59	81	81
Developing (ex OPEC)	334	604	837	837
OPEC	1,595	1,820	2,263	1,727
Total above	4,240	5,191	6,476	6,224
CPEs (Europe)	..	..	..	..
CPEs (Asia)	..	..	..	..
Total world	..	..	..	..
Requirements				
OECD [c]	3,466	4,204	5,094	4,886
Other developed [c]	83	99	122	122
Developing (ex OPEC) [d]	424	563	749	749
OPEC [e]	122	230	371	371
Total above	4,095	5,096	6,336	6,128
CPEs (Europe)	1,367	1,766	2,251	2,251
CPEs (Asia)	285	..	..	..
Total world	5,747	..	..	..
Net trade				
Net imports				
OECD	1,313	1,608	1,923	1,295
Other developed	38	49	51	51
Developing (ex OPEC)	114	-15	-59	-59
Total	1,465	1,642	1,915	1,387
Net exports				
OPEC	1,449	1,559	1,857	1,326
CPEs (Europe) [f]	40	35	-20	-20
CPEs (Asia) [f]	0	25	60	60
Total	1,489	1,619	1,897	1,366
Trade balance	+24	-23	-18	-21

Notes to Table 5.

a Assumed continuation of present policies toward conservation and production in OECD; oil price of $11.51 per barrel (1975 dollars) for Saudi reference type.

b Assumed modification of present policies leading to enhanced conservation and expanded production in OECD : oil price of $11.51 per barrel (1975 dollars) for Saudi reference type.

c Assumed annual average economic growth of 4.3 per cent, 1974-1980; and 4.1 per cent, 1980-1985.

d Assumed annual average economic growth of 4.5 per cent, 1974-1976; 5.6 per cent, 1977-1980; and 8.0 per cent, 1981-1985.

e Assumed annual average economic growth of 8.9 per cent, 1974-1976; 6.2 per cent, 1977-1980; and 8.0 per cent, 1981-1985.

f Oil only.

Source : OECD World Energy Outlook, 1977.

Table 6

World demand for and supply of oil, 1973-1985
(million tonnes)

	1973	1978	1979 e	1985 f
Net Imports				
OECD	1,295	1,298	1,292	1,460
CPEs (Europe)	-50	-75	-60	0
CPEs (Asia)	0	-15	-20	-20
LDCs (ex OPEC)	190	190	167	120
Total	1,435	1,400	1,380	1,560
OPEC				
production	1,525	1,480	1,480	1,810
consumption	90	125	125	250
Net exports	1,435	1,400 a	1,380 a	1,560

a Adjusted for stock changes.
e Estimate.
f Forecast.

Source : Based on NIESR, Economic Review, November 1979.

ENERGY CONSERVATION IN OECD COUNTRIES

Economic Affairs Division
Commonwealth Secretariat

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Energy Conservation in OECD Countries

CONTENTS

1. This note relates to some aspects of energy conservation in OECD countries. First it appraises the recent experience of conservation by way of analysing changes in the ratio of energy consumed to output produced and income generated in these countries. It then details some of the OECD country government policies and other measures encouraging energy conservation and comments on their probable effectiveness. Finally, it provides some indications of the incentives and scope for future conservation.

I. The recent experience

2. The term 'energy conservation' is capable of several interpretations : in its most simple sense it can be construed simply as 'doing with less', e.g. changing 'life-styles' or altering the composition of economies as a result of cyclical or structural factors; it can also be construed as 'doing better' e.g. raising efficiencies in converting, distributing and utilising energy through technological development. In a dynamic world both these constructions are likely to take place simultaneously, but in the advanced industrial countries during recent years cyclical factors seem to have been much more important than improved efficiencies in accounting for the remarkable drop in the ratio of change in energy consumed to that of GDP generated or industrial production.

3. Table 1 shows average annual rates of growth in energy consumption and in GDP for selected OECD countries during the 1970s, the data being split into two periods - 1970-73 when oil was still very cheap and supplies abundant and 1974-78 when it became more expensive and, at times, less abundant. Table 2 shows the same data expressed in ratio form (i.e. percentage change in energy consumption divided by percentage change in GDP) for 1970-73 and 1974-78, together with one earlier and longer period (1960-73) and projections for two later ones (1978-85 and 1985-90). Table 3 shows average annual rates of growth of energy consumed in industry and of industrial production for selected OECD countries on average during 1970-73 and 1974-78.

4. The following are the major features shown by the tables :

i) energy consumption and GDP each increased much less quickly on average during 1974-78 than during 1970-73 ;

ii) but whereas the overall average rate of growth in GDP decelerated by less than half, that in energy consumption slackened by around four-fifths ;

iii) it followed that the energy/GDP ratios were substantially lower on average during 1974-78 than they had been during 1970-73, the overall drop for OECD being from 0.9 to 0.3 ;

iv) such a low energy/GDP ratio is not expected to be maintained however, and for IEA countries(1) in total, the IEA Secretariat

1. The International Energy Agency, established in 1974, consists of 21 of the 24 member countries of OECD (all except Finland, France and Iceland).

has projected coefficients for the 1980s which are substantially above those registered on average during 1974-78, though significantly below those of earlier periods ;

v) several countries' consumption of energy actually declined on average during 1974-78 although their GDP continued to increase (albeit at reduced rates) ;

vi) in CECD as a whole, energy consumed by industry showed no overall change during 1974-78 while growth of industrial production was only two-fifths the rate of 1970-73 ;

vii) although there were marked variations between countries, in none of them did energy consumed by industry rise on average as quickly in the later as in the earlier period whilst in over half of them it actually declined ; and

viii) the average energy/industry ratios during 1974-78 were lower than during 1970-73 for almost all countries.

5. The following reasons can be adduced to explain the above factors :

i) although it is not possible to quantify the effects of energy conservation policies, much, almost certainly most, of the decline in the ratio of growth in energy consumed to that of GDP produced in OECD countries since 1974 can be attributed to economic recession or stagnation causing the composition of these countries' economies to undergo cyclical change ;

ii) these changes meant that comparing the two periods 1970-73 and 1974-77, the contribution to GDP of the industry sector (which accounts for about two-fifths of the final consumption of energy in OECD) decreased from 32% to 30%, whereas that of the services/commercial sector (accounting for only around a tenth of the final consumption of energy) increased from 53% to 55% ;

iii) within the industry sector, the 'heavy', energy-intensive industries were particularly depressed : comparing 1970-73 with 1974-78, production of steel, which accounts for between a fifth and a quarter of the consumption of energy in the industry sector, had risen on average by 5% annually during the earlier period but fell by 2% annually during the later one; growth in the production of chemicals, which accounts for around a sixth of the sector's consumption of energy, dropped from 7% to 3% annually, and that of aluminium from 7% to 2% annually; output of cement, which had grown on average by 7% annually during 1970-73, showed no growth on average during 1974-78. Production in the less energy-intensive industries, such as food, drink and tobacco, was generally less depressed and in certain industries, e.g. electronics, pharmaceuticals and precision instruments, it remained comparatively buoyant ;

iv) the pace of increase of energy consumption in the services/commercial sector also diminished after 1973, mainly as a consequence of the slowing down in economic activity, as it did in the residential sector, chiefly as a result of the more efficient utilisation of energy in the home (e.g. the change to using central

heating boilers rather than open fires). Together the rate of growth of energy consumption in these two sectors, which account for around a third of the total in OECD countries, slackened from 5% on average during 1960-73 to 0.4% during 1974-77 ;

v) growth of energy consumed in the transport sector - accounting for around a quarter of the OECD total - also diminished in pace after 1973, the 1974-77 annual average of 2.1% being much less than the 5% of 1960-73. Most of the deceleration reflected the slower rate of economic growth, although improved technical efficiencies and conservation policies played a part ; and

vi) turning to the future, the projected IEA energy/GDP coefficients of more than 0.8 for the 1980s, compared with 0.3 during 1974-78, are on the basis of a return to high rates of economic growth (1) and a resurgence in industrial production.

II. Government policies and other measures affecting energy conservation

6. Member countries of the IEA have been concerned with energy conservation ever since the Agency was established, and in November 1974 they adopted an International Energy Programme which included the long-term cooperation between members to reduce their excessive dependence on oil. In October 1977 the Agency adopted a Group Objective consisting of a ceiling target of 26 mbd(2) for net imports of oil in 1985 and reinforced measures of energy conservation, on a high priority basis with increased resources, to limit growth in energy demand relative to economic growth, eliminate inefficient use, especially of rapidly depleting fuels, and encourage substitution for fuels in shortest supply. The means by which these objectives would be attained included pricing policies (including fiscal measures), implementation of minimum energy-efficiency standards, and encouragement of increased investment in energy-saving equipment and techniques.

a) Oil import targets

7. The concept of a ceiling target for net oil imports became increasingly important during the course of 1979 as the rapidly changing situation and uncertain prospects in Iran led to growing anxiety among the IEA importers regarding the security of future supplies. In June, leaders of the seven countries at the Tokyo Summit had agreed on a set of goals for the limitation of oil imports, but these had been variously expressed and it was not until the December Ministerial Meeting of the IEA member countries that agreement was reached on country-by-country targets for the limitation of net imports of crude petroleum and petroleum products in 1980 and 1985. These targets, together with net imports during the 1970s, are shown in Table 4. The 1985 aggregate target of 26.2 mbd (including bunkers) is significantly lower than the previously agreed level of 27.6 mbd and well below earlier projections for 1985 of 29.7 mbd (1977 Review) or 28.5 mbd (1978 Review). Most of the decline was for the United States and Japan, the two largest importers.

8. The December meeting also agreed on an oil monitoring process. This would involve quarterly ministerial meetings when all aspects of oil supply and demand would be discussed, each country's results reviewed, and decisions taken whether the specific measures in operation were adequate and

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1. Average annual increases in GDP of 4.2% during 1977-85 and 3.6% during 1985-90 compared with an out-turn of 2.7% during 1974-78.

2. Million barrels per day.

being implemented effectively and whether additional measures were necessary. Ministers also agreed (i) on the importance of keeping domestic oil prices at world market levels or raising them to those levels as soon as possible; (ii) to seek to develop a system of consultation on oil stock policies, both among governments and between them and the oil companies; and (iii) to consider other measures leading to a more coordinated approach to oil spot market activities.

b) Other government policies and measures

i) Overview

9. The Secretariat of the IEA concluded in 1979 that the measures which had contributed most significantly to energy conservation in member countries were public information programmes, pricing policies, incentive schemes, and efficiency standards and regulations. In general the countries which had experienced the largest increases in energy prices and had the strongest conservation programmes had been those in which the energy consumed per unit of GDP had diminished most. Denmark, Netherlands and Sweden were judged by the IEA Secretariat to have strong and quite comprehensive programmes which were being effectively implemented. Canada, Germany, Italy, Japan, New Zealand, Norway, United Kingdom and United States had all implemented programmes but in general these needed reinforcement. Austria, Belgium, Greece, Ireland, Luxembourg, Spain and Switzerland had still not adopted significant measures except for information campaigns.

10. It is very difficult if not impossible to quantify satisfactorily the results of the conservation measures taken in countries. The IEA Secretariat has estimated that the overall efficiency in the use of energy improved by 2.3% in 1974, 4.2% in 1975, 4.5% in 1976 and 6.7% in 1977. But by basing their calculations on the average ratio of growth of energy consumption to that of GDP generated during the period 1960-73, they appeared to have assumed an unchanging composition of GDP, which was far from the case. It may have been the fallacious nature of this assumption which accounted for the apparently rather perverse results of some of their calculations for individual countries. These showed that in ten countries (Belgium, Denmark, Greece, Ireland, Italy, Japan, Luxembourg, Netherlands, Norway and United Kingdom), actual consumption of energy during 1974-77 was more than 4.5% lower than hypothetical consumption based on the average 1960-73 ratio of energy to GDP; for five countries (Austria, Canada, Germany, Sweden and United States), it was less than 4.5% lower; while for four countries (New Zealand, Spain, Switzerland and Turkey), actual consumption was equal to or higher than hypothetical consumption. Whilst these results would accord with the relative strength or weakness of conservation policies in some countries (e.g. strength in Denmark, Netherlands and to a lesser extent Sweden; weakness in Spain and Switzerland), they would appear to be very misleading for other countries (e.g. Belgium, Greece, Ireland and Luxembourg). It may be noted that in some of these countries, for example Belgium and Luxembourg, cyclical changes in the composition of GDP have been very marked as a result of the depression in the steel industry. Details of some of the main conservation policy elements in the three major energy consuming sectors are given in the following paragraphs.

ii) Industry sector

11. The composition of industrial energy conservation programmes has varied from one IEA country to another : some have placed the major emphasis on voluntary and incentive measures, whereas others primarily employ regulatory measures. Considerable progress has been made in conserving the use

of energy in industry, but there have been significant constraints of an economic nature (lack of funds and the long pay-back period for many energy-conservation investments), of an informational character (lack of awareness of technological possibilities, particularly in smaller enterprises) and of an institutional type (especially important for the use of waste heat). In consequence the IEA 1978 Review of Energy Policies and Programmes concluded that as this sector is the largest single user of energy in most IEA countries and is expected to show the greatest growth in energy consumption over the next decade or so, efforts to promote the conservation of energy in industry should be expanded and intensified.

12. The most important element in any energy conservation programme for industry was judged to be energy prices and taxes. Energy price increases from 1973 to 1977 were higher for use in industry than in other sectors but they varied considerably from one IEA country to another, depending in part on their mix of fuels in total energy consumed and in part on government fiscal policies. In general, increases were lower for those countries, such as Germany and Belgium, where use of coal was relatively more important than in those, such as Italy and Japan, where oil was comparatively more significant. One exception was the United States, where increases were restrained by domestic price controls and a passive fiscal policy toward fuels. Energy prices paid by industry still vary greatly from one country to another; in real terms they are probably highest in Japan and lowest in North America (particularly for natural gas). The evolution of energy price increases during the 1970s for selected OECD countries' industry sectors is given in Table 5, which also enables the making of inter-country comparisons of fuel prices in 1978.

13. A second major element in such a programme consists of financial and fiscal incentives to encourage investment in energy-saving techniques and equipment (including the greater utilisation of combined heat and power production in combination with district heating and that of waste heat and other waste). In 1978, twelve(1) IEA member countries provided grants or subsidies for this purpose and eight(2) of them provided loans. Eight (3) countries allowed various kinds of tax relief for this purpose.

14. Other elements of energy conservation programmes for industry include : (i) target setting by governments or industry associations for energy-intensive industries (in operation in five IEA countries, usually on a voluntary basis); (ii) schemes under which companies are required to report their energy consumption to governments (operated by five member countries) or are required to collect information on energy flows within industries (operated by nine IEA countries but on a comprehensive basis in only three and used only for advisory purposes); (iii) the provision of information on energy-savings by means of publication programmes (operated by seventeen IEA countries) or programmes of meetings and seminars (operated by twelve member countries); (iv) the provision of advice services for small and medium sized industries (operated by fifteen member countries); and (v) greater emphasis on the importance of appropriate patterns of fuel utilisation, particularly on the substitution of oil and, to a lesser extent, natural gas by other energy sources (part of the policies of thirteen IEA members).

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1. Canada, Denmark, Germany, Ireland, Japan, Netherlands, New Zealand, Norway, Spain, Sweden, United Kingdom and United States.

2. Austria, Denmark, Germany, Japan, Netherlands, New Zealand, Norway and United States.

3. Austria, Canada, Germany, Japan, New Zealand, Norway, United Kingdom and United States.

iii) Residential and services (commercial) sector

15. The greatest potential for energy-saving in the residential and services (commercial) sector lies in retro-fitting existing buildings and adopting codes which stipulate minimum thermal efficiencies for new buildings. In general the incentives available for and existing regulations on energy conservation in this sector appeared inadequate. Among IEA member countries in 1978, fiscal incentives for building insulation were available in only seven(1), grants in ten(2) and loans in eight(3). Building regulations incorporating energy conservation provisions were in operation in thirteen countries in the case of new homes, in eight in the case of existing homes, and in nine in the case of public buildings. Regulations on maximum air temperature existed in five countries and on maximum water temperatures in two. Six countries gave grants or other fiscal/financial incentives for the introduction of domestic solar heat/power systems, but experience in many IEA countries shows that the economics of conventional conservation measures are, for the time being, better than the economics of renewable energies, although this should change in the long-term. Standards programmes on the energy efficiency of domestic appliances were in operation in seven countries and in preparation in an eighth. Labelling of the energy efficiency or energy usage of domestic appliances was undertaken on a voluntary basis infour countries and under preparation in eight others; three countries operated labelling on a mandatory basis.

16. The promotion of energy conservation in the residential sector through the price mechanism appeared in general to have been rather relaxed in IEA countries during 1974-78. Although in most IEA countries prices increased significantly (more than in the transport sector but less than in industry), there were considerable variations between them; in general the increases were less steep in countries with strong currencies, such as Germany, than in those with weak ones, such as Italy. Prices themselves also varied substantially between countries : lack of data make comparisons difficult, but it appears that in 'real terms' they were particularly low for natural gas and heating oil in North America. The evolution of prices for certain fuels in the residential sector of the major OECD countries and inter-country comparisons of prices in 1978 are shown in Table 6.

iv) Transport sector

17. The IEA Secretariat has stated that it is more difficult to implement energy conservation programmes in the transport sector than in all others; consequently there has been little progress in improving the sector's energy performance. One reason for this has been the lack of price incentives : gasoline prices decreased in real terms from 1975 to 1978 (inclusive) in most IEA countries and by 1978 were higher than during 1973-74 in only four of them (Canada, Ireland, Italy and Spain). The evolution of gasoline and diesel prices during the 1970s is shown in Table 7, which also enables inter-country comparisons to be made of prices in 1978; the latter shows the very low level of prices of gasoline and diesel in North America (mainly due to the small tax element) and of diesel in Italy, where gasoline prices were the highest in the IEA. However, prices increased sharply during 1979 : in the EEC those of gasoline rose on average by over two-thirds and of diesel by around three-quarters; in the United States prices of gasoline and diesel each rose by more than two-fifths and, even more important, there were severe shortages during part of the year which led to rationing of gasoline in some states and to a fall in consumption of around 5%.

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1. Canada, Denmark, Germany, Greece, Spain, Sweden and United States.
2. Austria, Belgium, Canada, Denmark, Germany, Ireland, Netherlands, Sweden, United Kingdom and United States.
3. Canada, Germany, Japan, Netherlands, New Zealand, Norway, Sweden and United States.

18. The most important regulatory measures to conserve energy in the transport sector are the mandatory fuel economy standards adopted by the United States and Canada. In the United States minimum fuel economy standards have been set for automobiles manufactured after 1977. The standard is becoming progressively more stringent and is to reach 27.5 miles per gallon by 1985. In Canada similar standards have been announced to take effect in 1980 and 1985. Elsewhere, manufacturers in Germany have agreed to increase fuel economy by not less than 10% by 1985 and in Japan some 1978 models showed more than a 20% improvement in fuel economy over 1975 models. Fuel consumption labelling is already mandatory in Sweden, the United States and the United Kingdom, and some producers are applying voluntary schemes in Canada and Japan; the EEC Commission is considering the adoption of a scheme for the Community (the 'Europa Test'). Other government measures to conserve energy in the road transport sector include initiatives to promote car pooling schemes (in operation in four IEA countries and under consideration in seven others) and the implementation of speed limits (in operation in all member countries but at generally higher levels than during the 1974 energy crisis). One measure which would save energy, but which is so unpopular as not to have been taken on any significant scale, would be to ban private cars from city centres and thus to increase the use of the more energy-effective forms of public transport.

III. The incentives and scope for future energy conservation

19. The chief incentive for expanding and deepening the effort to conserve the use of energy is that of possible future shortage. In the short- or medium-term, such a shortage is likely only as a result of political instability in the Middle East or a marked change in OPEC oil production policies. Both are insufficiently improbable for the comfort of oil-importing countries. Many commentators now suggest it likely that OPEC's maximum oil production in the 1980s will remain at or around 31-32 mbd, compared with its present maximum technical capacity of some 39-40 mbd, and that output will be reduced if necessary to maintain real prices. In the longer-term a shortage could be caused by a lack of investment in conventional energy production facilities and/or a lack of energy resources.

20. The recent steep increases in OPEC prices, from some $13.50 per barrel at the end of 1978 to an average of around $27.00 per barrel at the end of January 1980, should have given a sharp fillip to planned conservation in the use of oil. Although the depreciation of the US dollar has mitigated the effects of recent price rises for many IEA countries, while the continuing inflation has softened the consequences for nearly all of them, pronouncements by OPEC make it unlikely that the 1980s will see any significant periods of declining oil prices in real terms. In February 1980, for example, an OPEC Committee, meeting in London, is understood to have agreed on an automatic system to raise oil prices in real terms. It was reported that the system would lead to prices being adjusted on a quarterly basis by first taking account of inflation and of currency movements in OECD countries and then raising the resultant prices by the percentage increases of OECD countries' GDP in real terms; oil production would be adjusted to demand in order to maintain such prices. The proposed system is to be considered by a full meeting of OPEC later in the year.

21. If such a scheme were adopted and implemented effectively, the price of oil in real terms could rise by, say, 2% to 4% or 5% annually, depending on the growth of OECD countries' economies (whether it would be allowed to fall if OECD growth became negative is another issue). This would provide a significant incentive to further efforts to conserve the use of oil, both because of the current rise in its 'real' price and because of the certainty that such rises would continue. Assuming the price of OPEC oil

sets a long-term ceiling to that of other sources of oil and of other forms of energy (taking into account their differing calorific values and other relevant factors, such as ease of use, certainty of supply, etc.), action by OPEC should also stimulate efforts to conserve the use of other forms of energy, particularly other depletable fossil fuels.

22. The scope for such further conservation is very substantial, though subject to varying estimates. One recent study(1) has estimated that in the EEC over a quarter of the primary energy input is lost at the processing and distribution stage and a further two-fifths in its conversion into useful energy; in other words only one-third of primary energy is transformed into useful energy. Data are given in Table 8.

23. Over two-thirds of the losses at the energy processing and distribution stage in the EEC have occurred in the conversion of primary energy into thermal electricity. The average net thermal efficiency of electricity generating stations is currently around 32%, although the newest plants achieve some 35% and in a few nuclear plants the rate is nearer 40%. As the maximum thermal efficiency likely to be achieved in conventional stations is only around 43% there is clearly need for the early and widespread adoption of other methods of cutting losses of energy in the generation of electricity; the most obvious means would be the greater use of combined heat and power (CHP) systems which give a total thermal efficiency at least 1.5 times higher than that obtained when heat and electric power are generated separately. The second largest losses at this stage have taken place in oil refining. There are technical difficulties in achieving further economies in this process owing to the need for product flexibility, but it has been held that in the medium-term (say by 1990) a net saving in crude oil input per unit of oil product output of 10%-15% can be achieved, and in the longer-term (say by 2025) one of 25% may be possible.

24. At the stage when delivered energy is converted into useful energy the greatest proportionate losses in the EEC have occurred in the transport sector where, it has been estimated, they reached some 80%. It has been suggested that between 1975 and 1985 the fuel efficiency of this sector could be improved by 16% in the EEC, by 18% in Japan, and by 35%-45% in North America; between 1975 and 2000 savings would be considerably greater, possibly of up to 35%-40% in the EEC. In all cases the bulk of the improvement would come from improved vehicle engine efficiency, although other factors such as lighter construction materials would also play their part.

25. In the residential and services (commercial and public administration) sector, it has been estimated that in the EEC over half of the delivered energy is lost in the conversion into useful energy. Much of this could have been saved with adequate insulation and it has been suggested that between 1975 and 1985 25% of energy used in this sector in the EEC could be saved and 45% by 2000.

26. In the industry sector, calculations suggest that almost half of the delivered energy is lost in the conversion to useful energy. Among the energy-intensive industries, fuel savings of at least 20%-25% per unit of finished steel have been suggested as achievable in the ECE region by the end of the century; these figures are probably conservative and significantly

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1. Fred Roberts : 'The scope for energy conservation in the EEC', 'Energy Policy' (IPC Business Press), June 1979.

higher ones have been quoted for individual countries (e.g. 30% in UK). In the chemical industry it has been estimated that savings of 15% in fuel input per unit of output could be achieved between 1975 and 1985 and of 20% by around 1995. In aluminium it has been calculated that raising the proportion of scrap recycled from, say, 20% to 40% would save around 12% of the energy consumed by the industry, while using the new Alcoa process for primary smelting would raise its energy efficiency from around 30% to 40%. In the cement industry the use of the dry process (as against the wet one) would lead to energy savings per unit of output of around 35%. In the case of other industries - some of which, like glass and brick-making, are energy-intensive - it has been estimated that the amount of energy consumed per unit of output could be reduced overall by around 15% between 1975 and 1985 and by some 25%-30% between 1975 and 2000.

27. The effects on total energy consumption per unit of GDP generated, of these technical possibilities for conserving the use of energy in particular purposes would depend on the future relative importance of the sectors in which the energy is used. The IEA Secretariat, in its 1978 Review, forecast that final consumption of energy in member countries from 1977 to 1990 would grow at below-average rates in the residential, services (commercial) and transport sectors, but at above-average rates in the industry sector; the last mentioned would therefore rise in relative importance while the others declined. Total final consumption of energy, it was forecast, would rise at about $2\frac{1}{2}$% annually whereas that of the primary energy input would increase at a higher rate during 1977-1985 (3.5% annually) than during 1985-1990 (2.9% annually)(1). Details are given in Table 9. Such a forecast would imply a considerably greater improvement in the efficiency of processing primary energy and of distributing marketable energy during 1985-1990 than during 1977-1985.

28. Taking all these factors into account, the IEA has concluded that member countries could save 10%-15% of their total energy consumption by 1985 if they follow a vigorous and systematic energy conservation policy. On assumed high rates of growth of GDP it forecast a decline in the ratio of primary energy consumed to GDP generated from 0.84 (1977-1985) to 0.81 (1985-1990). Another study(2) has suggested that by the end of the century around a third of the energy losses in the EEC could be saved and that the average energy/GDP coefficient may have fallen to 0.5 on assumed high rates of economic growth. A third study(3) has demonstrated in great detail how the United Kingdom GDP could increase on average by $1\frac{1}{2}$% or $2\frac{1}{4}$% annually between 1976 and 2025 (so that its GDP in 2025 was two or three times respectively more than that in 1976) and at the same time consume 22% or 8% respectively less primary energy in 2025 than it had in 1976. This would imply a negative energy/GDP coefficient (not unknown in the UK). A fourth study(4) has concluded that "with sufficiently high energy prices over the next few decades, the United States could double the efficiency with which it uses energy without significant adverse effect on economic growth". Whatever variations exist in the estimates, all agree that the scope for further conservation in the use of energy is very considerable in the long-term.

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1. These projections were based on expected annual GDP rates for the IEA group of 4.2% and 3.6% respectively.
2. Fred Roberts : 'The scope for energy conservation in the EEC', 'Energy Policy' (IPC Business Press), June 1979.
3. Gerald Leach et al : 'A low energy strategy for the United Kingdom' (IIED, Science Reviews 1979).
4. US National Academy of Sciences : 'Energy in transition, 1985-2010' (US Department of Energy, January 1980).

Table 1

Growth in energy consumption and in GDP for selected OECD countries, 1970-78*
(percentages, annual average)

	1970-1973		1974-1978	
	Energy	GDP	Energy	GDP
Canada	5.10	5.84	1.90	3.31
United States	3.54	3.65	0.65	2.68
Australia	5.04	4.85	4.07	2.53
Japan	8.19	9.00	0.82	3.95
Belgium	5.52	5.55	-0.69	2.27
Denmark	1.61	3.89	1.59	2.11
France	5.93	5.61	0.45	2.86
Germany	4.48	4.24	0.58	2.13
Ireland	3.37	4.49	2.05	3.43
Italy	5.60	3.77	1.67	1.97
Netherlands	10.10	4.78	-0.94	2.59
United Kingdom	1.95	3.60	-0.74	1.25
Austria	6.64	6.23	0.18	2.49
Greece	16.07	7.86	4.03	4.12
Norway	2.94	4.15	2.89	4.63
Spain	10.47	6.86	4.90	2.44
Sweden	0.97	2.14	1.19	0.88
Switzerland	6.25	4.06	-0.23	-1.32
Total[a]	4.4	4.7	0.9	2.7

*Average annual percentage growth rates calculated as exponential curves fitted to the data by least squares.

a Includes other OECD countries.

Sources: Commonwealth Secretariat calculations based on data from UN 'World Energy Supplies' (various issues) and OECD 'Economic Outlook', December 1979.

Table 2

Energy/GDP ratios for selected OECD countries, 1960-90*

	1960-1973	1970-1973	1974-1978	1977-1985	1985-1990
Canada	0.98	0.87	0.58	0.83	0.69
United States	1.05	0.97	0.24	0.76	0.90
Australia	..	1.04	1.61	..	..
Japan	1.00	0.91	0.21	1.05	0.76
Belgium	0.95	0.99	-0.30	0.76	0.58
Denmark	1.38	0.41	0.75	0.05	0.72
France	..	1.06	0.16	..	..
Germany	1.04	1.01	0.27	0.82	0.54
Ireland	1.08	0.75	0.60	1.36	0.89
Italy	1.51	1.48	0.85	1.05	0.90
Netherlands	1.61	2.11	-0.36	1.29	0.60
United Kingdom	0.71	0.54	-0.59	0.49	0.62
Austria	1.02	1.07	0.07	1.26	0.85
Greece	1.57	2.05	0.98	2.04	1.20
Norway	1.26	0.71	0.62	1.09	0.81
Spain	1.13	1.53	2.01	1.06	0.99
Sweden	1.08	0.45	1.36	0.52	0.59
Switzerland	1.28	1.54	0.17	0.60	0.88
Total a	1.0b	0.94	0.34	0.84b	0.81b

* Average annual percentage growth rates in energy consumption divided by average annual percentage growth rates in GDP during different periods. Note overlap in time-series between different columns. The average percentage growth rates for 1970-73 and 1974-78 have been calculated as exponential curves fitted to the data by least squares.

a Includes other OECD countries.

b Excludes France.

Sources: 1960-1973, 1977-1985 and 1985-1990: 'Energy policies and programmes of IEA countries, 1978 Review' (OECD, 1979); 1970-1973 and 1974-1978: Commonwealth Secretariat calculations based on data of energy consumption given in UN 'World Energy Supplies' (various issues) and of GDP given in OECD 'Economic Outlook', December 1979.

Table 3

Growth in energy consumed by industry and in industrial production for selected countries*

(percentages, annual averages)

	1970-1973		1974-1978	
	Energy consumed by industry	Industrial production	Energy consumed by industry	Industrial production
Canada	7.6	5.8	1.2	2.1
United States	2.4	3.4	0.5	2.3
Australia	4.3	4.3	3.7	0.8[b]
Japan	6.4	8.6	1.4	1.6
Belgium	3.6	4.6	-2.7	0.7
Denmark	3.6	..	-0.5	..
France	0.5	5.9	-0.7	1.7
Germany	3.5	4.3	-3.4	1.3
Ireland	3.6	5.1	2.1	4.3[c]
Italy	4.1	4.3	-1.7	1.4
Netherlands	7.3	6.4	1.3	1.2
United Kingdom	0.9	4.2	-0.0	0.7
Austria	6.1	6.9	-3.9	1.8
Greece	11.3	12.7	4.3	4.7
Norway	1.3	4.6	-0.2	4.7
Spain	9.6	10.4	2.7	4.3
Sweden	2.1	3.8	-3.1	-1.3[c]
Total [a]	3.5	4.6	0.1	1.8

* Average annual percentage growth rates calculated as exponential curves fitted to the data by least squares.
[a] Includes other OECD countries.
[b] Excludes ISIC class 2.
[c] Excludes ISIC class 4.

Sources: Commonwealth Secretariat calculations based on data in OECD 'Energy Balances of OECD Countries' (various issues) and OECD 'Indicators of Industrial Activity' and 'Industrial Production' supplement to 'Main Economic Indicators' (various issues).

Table 4

IEA countries : net imports of crude petroleum and petroleum products

(million tonnes, crude petroleum or equivalent)

	1970-73 Average	1974-78 Average	1974	1975	1976	1977	1978	1979 estimated	1980 target	1985 target
Canada d	-6.0	6.0	-4.9	1.4	8.9	13.4	11.2	7.9	7.4	29.4
United States	223.6	367.4	296.5	312.0	371.8	442.1	414.5	414.1	437.2	436.0
Japan	235.5	261.1	267.1	253.0	258.2	266.9	260.1	265.5	265.3	308.7
Australia	10.6	9.1	10.5	8.3	8.8	8.9	8.9	10.3	13.5	17.0
New Zealand	4.0	4.2	4.9	4.2	4.0	4.1	3.8	5.0	4.2	4.4
Belgium	28.8	26.6	28.8	25.6	26.1	26.6	26.1	28.0	30.0	31.0
Denmark	19.0	16.9	17.8	16.6	16.3	17.0	16.9	16.2	16.5	11.0
France a	111.6		127.1	103.2	120.4	112.6		n.a	117.3	111.0
Germany	133.6	135.6	133.6	124.0	141.0	138.5	141.1	149.1	143.0	141.0
Ireland	5.1	5.6	5.5	5.2	5.2	5.7	6.2	6.5	6.5	8.0
Italy	96.1	95.8	102.0	89.8	97.4	95.6	94.4	98.7	103.5	124.0
Luxembourg	1.5	1.4	1.6	1.3	1.4	1.4	1.5	1.4	1.5	2.0
Netherlands	37.4	36.3	35.9	31.5	37.6	35.6	35.6	40.9	42.0	49.0
United Kingdom d	110.8	76.4	113.2	90.5	82.8	54.1	41.5	19.6	12.0	-5.0
Austria	8.2	9.4	8.7	8.4	9.8	9.6	10.3	11.2	11.5	13.5
Greece	8.7	10.6	10.8	7.9	11.7	10.5	12.0	13.3	14.8	16.5
Norway d	7.5	-2.6	6.5	-1.6	-5.2	-4.0	-8.7	-10.2	-15.5	-18.3
Spain	34.1	45.0	42.4	40.8	47.2	46.8	47.6	49.7	51.0	52.9
Sweden	29.4	28.4	28.0	29.3	28.9	29.2	26.5	29.8	29.9	29.0
Switzerland	14.1	13.8	14.1	12.9	13.6	14.0	14.3	14.0	14.0	14.5
Turkey	6.6	12.2	9.7	10.0	12.8	14.8	13.6	16.6	17.0	25.0
Total b	1,008.6	1,159.2	841.1	1,071.1	1,233.5	1,230.0	1,177.4	1,187.6	1,205.3	1,289.6
Bunkers	c	c	c	c	c	c	72.3	71.6	70.0	80.0
Total less bunkers	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	1,105.1	1,116.0	1,135.3	1,209.6
Total (mbd)	(20.5)	(23.6)	(17.1)	(21.8)	(25.1)	(25.0)	(23.9)	(24.1)	(24.5)	(26.2)
Total less bunkers (mbd)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	(22.5)	(22.7)	(23.1)	(24.6)

Note: Country figures for 1970-1977 include bunkers and for 1978-1985 exclude bunkers.

a Not a member of IEA Agreement.
b Excludes France.
c Included in country figures.
d Negative sign indicates net exports.

Sources: 1970-1977: OECD 'Energy Balance of OECD Countries, 1975-1977' (Paris 1979);
1978-1985: IEA Press Release (11 December 1979) and OECD Economic Observer, January, 1980.

Table 5

Average prices of major fuels consumed in industry sector

1968 = 100 a

	Average 1970-1973	1974	1975	1976	1977	1978	Price b
Electricity c							
United States	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Japan	107.4	107.4	191.1	191.7	233.8	236.5	554.6
Germany	96.9	112.2	132.5	141.7	143.6	150.9	540.7
United Kingdom	112.0	133.8	198.9	247.9	286.6	320.6	409.3
France	108.4	119.2	163.0	222.2	230.0	244.7	404.6
Italy	99.4	96.7	164.1	222.1	294.9	340.6	435.1
Canada	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Natural gas d							
United States	237.3	256.6	337.0	378.3	468.0	520.3	71.8
Japan	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Germany	n.a	n.a	n.a	n.a	n.a	n.a	n.a
United Kingdom	112.2	183.3	250.0	325.5	345.6	443.4	115.0
France	120.1	150.8	277.4	276.6	312.0	380.4	107.5
Italy	123.9	128.8	336.8	391.4	515.8	601.9	82.1
Canada	113.2	131.1	177.5	262.3	347.7	393.4	54.3
Coal e							
United States	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Japan	121.0	135.5	187.1	245.1	267.0	306.7	94.3
Germany	129.5	161.3	210.9	233.0	234.0	234.0	125.9
United Kingdom	135.2	145.3	291.9	390.7	442.0	512.8	84.0
France	139.5	168.0	216.5	234.9	286.6	303.6	77.7
Italy	117.9	227.1	235.0	249.3	283.3	301.6	63.5
Canada	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Heavy fuel oil f							
United States	138.6	333.3	487.2	500.0	586.7	563.0	109.8
Japan	100.5	177.7	310.5	358.9	379.6	354.3	106.3
Germany	120.7	208.4	298.2	267.8	273.0	267.8	96.5
United Kingdom	131.0	183.3	404.2	443.7	609.4	573.0	104.8
France	107.9	218.6	290.0	266.9	311.8	343.0	88.6
Italy	117.9	177.8	373.3	570.8	643.0	673.0	89.6
Canada	n.a	n.a	n.a	n.a	n.a	n.a	n.a

a Indices based on average prices in terms of national currencies.
b Average price in 1978, in terms of US dollars per unit of energy equivalent to 10^7 Kcal (i.e. one tonne of oil).
c Annual consumption of 15 GWh.
d Annual consumption of 5,000 x 10^6 Kcal
e Steam coal, washed, 0-10 mm.
f Annual consumption of 5,000 tonnes.

Source: OECD Energy Statistics, 1975-77 (Paris, 1979).

Table 6

Average prices of major fuels consumed in residential sector

1968=100 a

	Average 1970-73	1974	1975	1976	1977	1978	Price b
Electricity c							
United States	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Japan	106.6	106.6	127.7	127.8	153.9	153.9	972.3
Germany	120.6	148.0	164.7	175.3	179.2	181.1	1,001.6
United Kingdom	112.1	132.0	171.5	231.0	274.1	305.6	616.2
France	114.0	131.1	166.6	166.5	197.5	211.7	823.2
Italy	83.6	81.5	142.3	183.5	231.8	266.9	836.0
Canada	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Natural gas d							
United States	113.7	137.4	163.8	189.7	n.a	n.a	n.a
Japan	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Germany	108.1	111.5	131.9	156.6	181.7	182.1	450.0
United Kingdom	116.8	137.6	159.3	183.3	195.9	219.7	185.0
France	128.4	148.7	204.3	204.3	221.3	235.6	350.0
Italy	112.8	125.7	125.7	239.2	347.5	378.9	152.2
Canada	91.6	92.4	108.1	136.0	179.5	200.9	77.5
Coal e							
United States	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Japan	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Germany	121.9	163.0	216.8	250.1	207.2	229.6	211.4
United Kingdom	117.2	125.5	155.7	199.6	251.5	296.6	132.8
France	124.1	156.9	205.5	244.5	239.0	247.6	139.9
Italy	115.0	145.0	224.7	275.4	312.9	333.2	145.8
Canada	115.8	144.3	188.9	203.3	288.0	380.0	191.5
Heating oil f							
United States	104.4	256.7	310.5	333.8	368.6	400.0	149.0
Japan	116.1	176.0	256.8	259.7	262.3	264.9	232.8
Germany	n.a	n.a	n.a	n.a	n.a	n.a	n.a
United Kingdom	70.1	160.0	285.8	311.6	384.0	418.6	179.6
France	120.3	251.4	286.7	314.6	348.3	385.4	193.6
Italy	94.1	182.5	234.9	377.3	439.6	474.9	180.9
Canada	126.2	168.7	179.4	210.0	257.2	286.8	127.4

a Indices based on average prices in terms of national currencies.
b Average price in 1978, in terms of US dollars per unit of energy equivalent to 10^7 Kcal (i.e. one tonne of oil).
c Annual consumption of 3,600 kwh.
d Annual consumption of 5.0×10^6 Kcal.
e Anthracite of 5-10 mm in 500 kg lots.
f Gas/diesel oil in 5,000 litre lots.

Source: OECD Energy Statistics, 1975-77 (Paris, 1979)

Table 7

Average prices of major fuels consumed in transport sector

1968 = 100 a

	Average 1970-73	1974	1975	1976	1977	1978	Price b
Gasoline c							
United States d	109.5	135.5	153.3	168.9	175.5	181.1	16.3
Japan	96.0	149.0	202.4	209.2	210.1	205.2	50.8
Germany	99.1	126.8	136.0	138.3	139.0	140.2	43.7
United Kingdom	127.4	153.0	268.5	271.0	286.6	280.0	32.0
France	112.0	166.0	173.3	180.1	213.7	224.8	50.1
Italy	120.3	153.8	230.8	307.7	384.6	384.6	57.4
Canada	111.9	129.4	137.6	175.2	185.3	199.0	19.8
Diesel oil e							
United States f	n.a	169.7	284.8	430.3	433.3	506.0	15.2
Japan	88.1	124.4	179.9	184.6	184.5	176.7	26.5
Germany	100.6	129.2	144.3	148.7	147.6	149.7	42.4
United Kingdom	149.0	183.6	245.0	272.0	344.0	374.6	35.7
France	112.7	156.9	175.1	188.4	202.6	216.9	30.2
Italy	108.9	161.4	192.9	240.0	214.3	214.3	17.2
Canada	n.a	n.a	n.a	n.a	n.a	n.a	n.a

a Indices based on average prices in terms of national currencies.
b Average price in 1978, in terms of US dollars per 100 litres.
c Premium gasoline (octane rating 95 or over).
d Regular gasoline (octane rating 94 or below).
e Retail prices.
f 1971 = 100.

Source: OECD Energy Statistics, 1975-77 (Paris, 1979).

Table 8

EEC consumption of energy in 1975 (million tonnes, coal equivalent)

Sector	Domestic, commercial, public administration, agricultural	Industry	Transport	Total
Primary energy input	455	620	225	1300
Non-energy use		-70		-70
Processing and distribution losses[a]	-136	-161	-40	-337
Delivered energy[a]	319	389	185	893
Conversion losses[a]	-175	-175	-148	-498
Useful energy available[a]	144	214	37	395

a Estimated.

Source: based on data in Roberts, op.cit.

Table 9

IEA countries : final consumption of energy by sector

Sector	Consumption (m.t.o.e*) 1977	1985	1990	Growth (% per annum) 1977-1985	1985-1990
Residential and commercial					
total	821	956	1043	1.9	1.8
(of which oil)	(337)	(372)	(388)		
share of sector in total (%)	34	31	30		
Transport					
total	685	773	858	1.5	2.1
(of which oil)	(680)	(766)	(849)		
share of sector in total (%)	28	25	25		
Industry **					
total	826	1166	1394	4.4	3.7
(of which oil)	(310)	(437)	(514)		
share of sector in total (%)	34	38	40		
Non-energy uses					
total	102	156	173	n.a.	n.a
(of which oil)	(96)	(142)	(159)		
share of sector in total (%)	4	5	5		
Total					
final consumption	2434	3051	3468	2.6	2.5
(primary energy input)	(3335)	(4397)	(5080)	(3.5)	(2.9)

* m.t.o.e. = million tonnes of oil equivalent.

** Energy uses only.

Source : International Energy Agency 'Energy Policies and Programmes of IEA Countries, 1978 Review' (OECD, 1979).

ENHANCING SUPPLIES OF ENERGY AVAILABLE TO ENERGY NET-IMPORTING DEVELOPING COUNTRIES

Economic Affairs Division
Commonwealth Secretariat

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Enhancing Supplies of Energy Available to Energy net-importing Developing Countries

CONTENTS

1. This note sets out some of the principal factors relevant to increasing the supplies of energy available to the energy net-importing developing countries (OIDCs)(1). The note first provides information on some aspects of energy consumption in developing countries. Its second section is concerned with the energy resources potential of OIDCs. The third section briefly reviews the technological and financial requirements for increasing energy production in OIDCs and the extent of external assistance available to them; it also examines how energy production in these countries might be expanded through greater international cooperation, and stresses the importance to them of a global strategy for energy which would include arrangements for imports. Finally the note gives a few indications of the possibilities of conserving energy in OIDCs through improving the efficiency of its utilisation.

I. Some aspects of energy consumption in developing countries

2. In most developing countries, 'non-commercial' fuels (2) have been very important as sources of energy, but growth in their consumption has been much slower than in that of 'commercial' fuels, which increased swiftly during the 1950s and 1960s and was well maintained after the 1973-74 oil price rises (Table 1). Compared with the usually presented picture, therefore, developing countries' consumption of energy is greater in total (a broad estimate being of at least 1.5 billion tonnes, coal equivalent, in 1978 compared with 0.9 billion tonnes for 'commercial' fuels alone) and in per capita terms (at least 720 kg, coal equivalent, in 1978 compared with 450 kg for 'commercial' fuels) while their proportion of global consumption is higher (at least 16% in 1978 compared with 11% for 'commercial' fuels); their rate of increase in consumption however has been less fast (5% on average during 1974-78 compared with $6\frac{1}{2}$% for 'commercial' fuels).

3. Per capita 'commercial' energy consumption in OIDCs varies greatly in quantity and in relative economic importance, depending on the availability of local energy resources, level of incomes, and structural composition of economies (Table 2). The energy/GDP ratio(3) has been higher on average in developing market economy countries than in developed market economy countries, and its size has tended to increase (averaging 1.2 during 1970-73 and 1.3 during 1974-78), suggesting that the economies of most developing countries are becoming more 'energy-intensive'. The ratio has varied substantially from one developing country to another and during 1960-76 there did not appear to be any marked positive correlation between its average size and the average rate of increase in GDP (Table 3). In general the ratio tended to be highest in the poorest developing countries and lower in the

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1. Because the imports of energy into the energy net-importing developing countries consist almost entirely of oil, these countries are referred to in this note as 'oil-importing developing countries', abbreviated to 'OIDCs'.

2. Fuelwood, animal and vegetable wastes.

3. The ratio of the percentage increase in 'commercial' energy consumed to that of GDP generated.

more prosperous ones, being less than unity for certain middle-income developing countries. One explanation for this is that it may be among the poorest countries that the substitution of 'commercial' for 'non-commercial' fuels in the incremental use of energy is most marked, and that coefficients of growth in total energy consumption to that of GDP would be quite different.

4. Developing countries have been more dependent on oil than on other sources of 'commercial' energy, a dependence which increased during the 1950s and 1960s before levelling-off after 1973; their dependence on oil has also been significantly greater than that of the developed market economy countries (Table 4). In only two developing market economy countries (India and Zimbabwe) has the consumption of coal been more important than that of oil, while in only two others (South Korea and Mozambique) has it been of significance. Many developing countries generate hydro-electricity - which is often the second most important source of 'commercial' energy - but upwards of two dozen of them are entirely dependent on oil.

5. There are no comprehensive data on the sectoral consumption of energy in developing countries; all estimates are therefore somewhat arbitrary and should be treated with caution. Compared with developed market economy countries, 'commercial' energy consumed by the residential, agricultural and transport sectors of developing countries appears to be of greater comparative importance and that by their commercial/public administration and industry sectors of lesser comparative importance. If account is taken of 'non-commercial' fuels, however, the transport sector is probably of less significance in developing than in developed countries. For consumption both of total energy and of 'commercial' energy the industry sector is the most important in developing countries, followed by the residential sector, the transport sector and, at much lower levels, the agricultural and commercial/public administration sectors (Table 5).

6. The use of energy in the residential sector of developing countries is dominated by heat for cooking, which in the rural areas is derived almost entirely from 'non-commercial' fuels. Almost all energy used in the commercial/public administration sector is electricity. The comparative importance among developing countries of these two sectors is fairly stable, but that of the transport sector varies considerably, usually being much higher in the oil exporting countries than oil importing countries, among which there are great variations in levels of per capita consumption of gasoline. The energy importance of the industry sector also varies greatly, being much higher in developing countries which are industrialising generally or where energy-intensive industries account for a significant proportion of GDP than in the least developed ones. In developing countries as a whole, the coefficients of the ratios of increase in commercial energy consumption to industrial and manufacturing production have tended to rise(1) as a result of the growing relative importance of energy-intensive basic industries, such as steel, chemicals, non-ferrous metals, oil refining and electricity generation.

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1. Average 1970-73: Energy/industry ratio 1.00; energy/manufacturing ratio 0.93. Average 1974-77: Energy/industry ratio 1.56; energy/manufacturing ratio 1.18.

   (Note : energy consumption data are for all sectors)

7. Over 120 of the 150 or so developing countries and territories are net importers of 'commercial' energy. Their import dependence varies considerably, as can be seen from Table 6, which shows that of 67 OIDCs, two-thirds (accounting for nearly a quarter of aggregate population) had an energy import dependence in 1978 of more than 95% whereas under one-tenth had a dependence of less than 25%. Although per capita income rather than import dependence has been the main determinant of per capita levels of consumption, at any given level of income there was a tendency for consumption of energy to be higher, the lower the import dependence of the country concerned.

II. The energy resources potential of energy net-importing developing countries

8. The prospects of OIDCs for increasing energy production differ markedly, depending on their resources potential and on the availability of capital, trained manpower and suitable technologies. No comparable, comprehensive and up-to-date information on the energy resources of OIDCs is available, and earlier estimates which showed these countries' reserves as representing very small proportions of the world total were a reflection not of the size of their resources but of the very low levels of exploration which had been undertaken in the countries concerned.

9. Before the 1973-74 price rise, only 10 of the OIDCs produced oil in commercial quantities; subsequently a dozen or more entered into production while exploration was either started or intensified in over 50 others. The result was a steep rise in the proven oil reserves of OIDCs which by 1978 had reached 2 per cent of the world total (about the same as their proportion of world production). Yet much potential still exists, as these countries are estimated to account for at least 15 per cent of the world's ultimately recoverable reserves. Their problem has been inadequate geological exploration. In 1976 only 12 per cent of the world's petroleum exploration expenditures were in OIDCs (a mere 4 per cent in the non-oil producers), while during 1974-76 average annual expenditures on geophysical activities by the industry were considerably less in Africa, Latin America and south and south-east Asia together ($355 million) than in the United States ($508 million) where the prospects were far less promising. The distribution of expenditure on drilling activities was similarly skewed. The inadequacy of the effort in OIDCs was shown by a survey conducted in 1978 for the World Bank. This showed that of 67 OIDCs, 11 had potential petroleum resources which were categorised as 'very high' (over 1.5 billion barrels), 9 as 'high' (0.75-1.5 billion barrels), 15 as 'fair' (0.1-0.75 billion barrels) and 32 as 'low' (under 0.1 billion barrels - but still sufficient for the needs of some small least developed countries). But of these 67 OIDCs, exploration efforts in 37 were categorised as 'inadequate', in 20 as 'moderate' and in only 10 as 'adequate'. Moreover, of the 20 countries with 'high' or 'very high' prospective reserves, only seven had been explored 'adequately'.(1)

10. A similar picture exists for natural gas, much of which is associated with oil. Whilst increased exploration since 1975 has led to a marked expansion in the proven reserves of the OIDCs, the relatively much lower drilling activity in these countries than in, say, the United States (on a scale of 1:100 approximately) has meant that ultimately recoverable reserves are almost certainly many times larger, especially for non-associated deposits ('dry'gas).

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1. "A programme to accelerate petroleum production in the developing countries"; study prepared by IBRD for UN Committee on Natural Resources, May 1979.

11. The availability of cheap and abundant imported oil was a substantial discouragement to expenditure on coal exploration in OIDCs before 1974; in only two or three of them were domestic resources exploited on a significant scale and most had not been explored geologically for coal. More recently exploration has increased considerably, and over two dozen OIDCs are now known to have substantial deposits of coal. For these countries the need is to determine more reliably the extent and quality of the reserves, but for the majority of OIDCs additional exploration is needed simply to survey the countries concerned in the hope of discovering deposits and then delineating them in order to provide a meaningful evaluation of reserves.

12. The OIDCs are relatively well endowed with resources for producing nuclear electricity, the energy content of which is many times their present production of primary electricity.(1) For this fuel, therefore, the problem for these countries is not of inadequate resource exploration but of the vast amounts of capital and complex technologies which are needed to harness it.

13. Resources of fossil fuels and fissile materials are very unevenly distributed among the OIDCs and many have no significant reserves. Those of renewable forms of energy, on the other hand, are much more widely distributed. Apart from arid countries, most OIDCs have hydro resources, only 4 per cent of which have yet been exploited; as one example of the potential which exists, it may be noted that in Africa installable hydro capacity exceeds current consumption of all types of energy and yet hydro electricity provided only 3 per cent of the total in 1978. As most OIDCs have abundant sunshine the potential for solar energy production is obviously considerable when appropriate technologies have been developed. The geothermal potential is similarly good while biomass conversion systems are already making noticeable contributions in some countries.

III. Need for new and expanded mechanisms to facilitate increased supplies of energy available to energy net-importing developing countries

14. The OIDCs are deficient in the technologies, manpower skills and financial resources needed to raise their production of energy to levels commensurate with their consumption objectives, and they also lack long-term assurances of energy imports at adequate levels and reasonable prices. Mechanisms are needed to assist these countries improve their technological capacities and to help them fill the gap between the level of funds which under present conditions is likely to be forthcoming for their energy industries and that required to achieve their production targets. A mechanism is also needed to assure their imports of energy.

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1. OIDC resources of low cost uranium have an energy content of 60 times the 1978 output of primary electricity in these countries if used in slow thermal reactors and of 3,700 times if used in fast breeder reactors; in addition they possess low cost thorium resources whose energy content is 3,300 times their 1978 primary electricity production if used in breeder reactors.

i) Technology requirements and assistance

15. Energy systems technologies are usually large-scale and often complex, most markedly for oil, gas and nuclear fuels. The exploration, development and production stages of oil and gas are still largely dominated by a small number of independent contracting firms which provide specialised equipment and know-how and highly skilled manpower. Barriers to entry into these stages of the industry are usually high, particularly in the case of exploration where the risk element is often beyond the bearing capacity of local enterprises. Technological barriers are lower for standard oil refining operations, but the substantial economies of scale, high cost structures and specialised nature of certain of the more sophisticated refining processes constitute serious economic barriers to many OIDCs.

16. Technologies for the production of coal are much simpler than those for oil/gas and many have been developed by state-owned enterprises which are generally more flexible in their licencing policies than private corporations. Technologies for thermal and hydro electricity generating plant are also relatively simple in the case of small projects, although they become more complex with larger capacities; operating technologies are comparatively simple, and transmission and distribution technologies have become standardised. The key technological aspects lie in the manufacturing of heavy electricial equipment which is dominated by a relatively small number of transnationals; these operate a cartel in external markets and have faced charges of excessive pricing for contracts undertaken in OIDCs.

17. Specialised technologies are needed for generating electricity from non-conventional sources. Nuclear power technology provides a number of problems for OIDCs: uranium mining is highly concentrated, fuel supplies are complicated by institutional arrangements and the technology of all stages of the fuel and reactor cycles is complex, with substantial economies of scale and steep barriers to entry into the market, both for operating know-how and for equipment. The nuclear option is thus viable for relatively few OIDCs. Solar energy technology appears more promising for these countries, although as the area is still relatively new, firm conclusions are difficult to draw. The technologies range from the very simple to the highly complex, from very small operating and investment costs to quite large ones. It appears that for most OIDCs the greatest potential lies in solar thermal collectors for low-grade heat and electricity generation, particularly for small-scale operations in rural areas.

18. OIDCs face a number of vital constraints in attempting to meet the technological requirements of energy investments from their own capabilities.(1) Chief among these constraints is a deficiency in skilled manpower, particularly of engineering and managerial personnel. From that deficiency follow other constraints, e.g. inadequate information on technologies available and a lack of expertise in negotiating for them, an insufficient ability to absorb or adapt received technologies or to develop new ones, and an inadequate capacity to manufacture or in some cases even to service, energy plant and equipment. Technical assistance is required to help OIDCs overcome these constraints.

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1. See e.g. "Energy supplies for developing countries: issues in transfer and development of technology" (UNCTAD, October, 1978).

19. A significant amount of assistance is already available in the energy field. The UN Department of Technical Cooperation for Development, as executing agency for UNDP, has provided increasing assistance for energy exploration projects. The World Bank's expanded programme for fuel minerals (which commenced in July 1977) has a technical assistance component whose main purpose is to improve energy sector planning and development programmes. Technical assistance has also been forthcoming from other multilateral sources, e.g. from the EEC for solar energy in ACP countries and from OPEC for electric power development, as well as from various countries' bilateral programmes.

20. Yet there is abundant evidence of need for expanded technical assistance on energy technologies, and various proposals have been made for achieving it. In May 1977 the UN Secretary-General had proposed (to the fifth session of the UN Natural Resources Committee) the creation of a Consultative Group on Energy Resources Development, which would draw together the UNDP, World Bank and other substantive units of the UN system, along with other international organisations and interested governments, in order to channel technical assistance to developing countries for exploiting their energy resources.(1) In July 1978 a Group of Experts was commissioned to prepare a report, inter alia, on the availability of mechanisms for the transfer of technology to developing countries for exploration and exploitation of natural resources; among their recommendations was that the UN system should devise an appropriate framework to coordinate technical assistance activities. (2) In June 1979 the UN Secretary-General had proposed (to the sixth session of the Natural Resources Committee) an expanded UN programme for technical cooperation on energy. (3)

21. The content of these various proposals and recommendations varied in certain details but all emphasised the need for massive assistance to enable these countries to establish or strengthen their energy technology training facilities and R & D institutions, their energy strategies and policies (including resources evaluation and technology transfer), and their energy data base. Little if any action of significance seems to have been taken however, and the 1979 session of the Natural Resources Committee merely noted the latest of these proposals and remitted it to the Administrator of UNDP for consideration, with a request that a report be submitted to the Governing Council of UNDP and to the next session of the Committee in 1981. Further consideration of these issues by the Committee should also take into account the Brandt Commission's proposal for a global energy research centre to be set up under UN auspices.

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1. "Strengthening international cooperation in energy : possible approaches" (UN, April 1977).

2. "Report of the group of experts on mineral and energy exploration in developing countries", reproduced in "Development and International Cooperation - multilateral development assistance for exploration of natural resources" (UN, October 1978).

3. "Some energy problems and issues in developing countries" (UN, April 1979).

ii) Financial requirements and assistance

22. Because of the large-scale of production necessary and complex nature of the technologies involved, the level of funds needed to meet the financial requirements of energy systems is very high. In the case of fossil fuels they are highest for oil, in whose production the OIDCs are most deficient, and on which almost all of them depend the most. The investments needed for geological/geophysical surveys, for example, range from $0.5 to $5.0 million per project, whilst those for exploratory drilling range from $10 to $50 million per 10,000 sq. km. The main financial constraint exists at this latter stage because of the high risks involved and the inadequacies of domestic risk capital, aggravated in many OIDCs by the absence of expertise in negotiating mentioned earlier. Revised estimates by the World Bank(1) suggest that over the ten years 1976-1985 the OIDCs could raise their oil consumption by 5% annually whilst only increasing their imports by 3% per annum if they could expand their oil production by 9% a year, which would require annually investment funds of $3.4 billion (1977 dollars).(2) The IBRD also calculated that an increase of 10% per annum in the natural gas production of these countries would require an annual investment of $0.6 billion (1977 dollars). (2)

23. Capital investment requirements for coal development vary widely, but by comparison with oil they are fairly modest, especially if the costly infrastructural facilities needed are excluded. A recent estimate by the World Bank (3) suggests that developing countries would need some $20 billion (1978 dollars) between 1978 and 1990 for coal mining and transport facilities if they are to raise their coal production from the 1977 level of 176 million tonnes to 440 million tonnes by 1990. This implies an average annual investment of around $1.5 billion (1978 dollars). Electric power generation is the largest energy industry in the OIDCs and a 1975 World Bank projection put their annual requirement for capital investment during the period 1974-80 at $3.8 billion (1973 dollars). It would be much higher now and if a World Bank projection of a near trebling in the OIDCs' production of primary electricity from 1976 to 1985 is to be met, very substantial investments would be needed, possibly of the order of $6 to $7 billion annually. Most of this would be for hydro stations, much of the remainder for thermal plant and an increasing amount for nuclear reactors; in addition large amounts of capital would be needed for electricity transmission and distribution, especially in rural areas. Given adequate technological progress, capital would also be needed later in the decade for small-scale solar generation plant, wind generators and possibly geothermal plant.

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1. "A programme to accelerate petroleum production in the developing countries", study prepared by World Bank for UN Natural Resources Committee, May 1979.

2. Covers investment in upstream activities only, i.e. oil and gas exploration (25%-30%), development and production (including crude oil pipelines). These activities account for about half the total investment required; the remainder (downstream activities) consists of refining, transport and distribution.

3. "Coal development potential and prospects in the developing countries", World Bank, October 1979.

24. The amount of financial assistance available to help OlDCs to expand their energy production has increased significantly during recent years, but not by as much as would be required if these countries are to meet their energy objectives. The size of the financing gap has been variously estimated, but the Group of Experts commissioned by the UN Secretary-General in 1978 to prepare a report,(1) inter alia, on financial requirements over the following 10-15 years for the exploration and location of natural resources in developing countries and on the availability of multilateral mechanisms for the provision of adequate finance for the exploration of natural resources, concluded that for petroleum exploration alone, a gap of $1-$2 billion (1976 dollars) per annum existed in the OlDCs for the period from 1978 to 1990. They emphasised, moreover, that the size of the gap would be much higher if more consideration were given to realising the petroleum potential of these countries or their reaching self-sufficiency. Regarding the availability of multilateral financing mechanisms, the Group concluded that (i) no new institutions were required for petroleum exploration financing; (ii) consideration should be given to the World Bank providing funds (including equity) on appropriate terms to OlDCs for petroleum exploration; (iii) consideration should be given to the creation of a mechanism to tap private capital markets under a guarantee mechanism supported by interested countries; (iv) multinational finance agencies should consider a 'commitment' procedure to create a partnership at the prospecting phase without necessarily participating in direct exploration funding; and (v) the UN Revolving Fund for Natural Resources Exploration should be expanded to include geothermal projects.

25. Since that report was presented, the World Bank has further extended its lending activities in the energy field to include oil and gas exploration, coal and other sources of energy from January 1979(oil and gas development had been added to the traditional Bank role in the electric power section in July 1977). During the Bank's present energy programme (fiscal years 1979-83) its lending is expected to increase substantially, and by the end of the period should have reached annual rates of $1.2 billion for oil and gas exploration, development and production, and $100-200 million for coal; in addition it expects to lend $1.5 billion annually for electric power development (all data in current dollars).

26. Reference to the figures given in paragraphs 22 and 23 make it apparent that if OIDCs are to continue to expand their consumption of 'commercial' energy at a fast pace and simultaneously begin to reduce their dependence on external sources, very substantial financial resources will be needed. No authoritative estimates of the overall requirements are available, but if the OIDCs were to increase their 'commercial' energy consumption from 1976 to 1985 at an annual average rate of, say, 6% and restain the growth in their net imports of energy to half that rate, it would appear that the additional annual capital for the necessary energy exploration/development/production/refining/distribution activities would be of the order of at least $16 billion (1977 dollars). Around four-ninths of that investment would be for the oil and gas sector, a similar proportion for electricity (primary and secondary) and the remaining one-ninth for coal. Rolling this estimate forward and making an allowance for inflation, it would seem that during the 1980s OIDCs might need annual capital

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1. "Report of the group of experts", op. cit. (UN, October 1978).

of the order of at least $20-$25 billion (1980 dollars) if their energy systems are to meet desired objectives. The bulk of this investment would have to be raised from domestic sources and from the private international capital market, but there would seem to be need for official multilateral loans of at least $4-$6 billion a year. (1)

27. Part of this official multilateral loan requirement will be met by the World Bank, whose energy loan programme should be assisted by the doubling of the Bank's capital base, but it is clear that new initiatives are called for by the UN system and other organisations. One initiative would be a change in the World Bank's gearing ratio from 1:1 to 2:1, as recommended by the Brandt Commission. Another would be an expansion in the energy assistance of the UNDP, and an extension of the UN Revolving Fund to cover the energy sector, but this would appear to depend on the provision of substantially larger resources being made available under official development assistance programmes to multilateral agencies.

28. There is also need for much greater direct investment in the energy sector of OIDCs. One possibility of raising the necessary funds might be through a levy by OPEC of, say, 50 US cents per barrel on its oil exports to OECD member countries. This would account for only some 2% of OPEC revenues from the export of oil but would produce around $4.5 billion annually and thus make a substantial contribution to the energy investment requirements of OIDCs. There is also need to tap more equity funds from the private capital markets by means of modifying and otherwise improving the usual contractual arrangements in order to provide a more stable environment and thus to lessen the element of risk. Various possibilities deserve further attention, including an extension of developed countries' investment guarantee schemes into the exploration phase of the energy sector, an involvement of multilateral financial agencies in partnership at the exploration stage, a more favourable developed country tax policy toward overseas energy exploration ventures, and a separation of licencing for exploration from that for production.

iii) Import assurances

29. The long leads and large investments needed to plan and implement energy production systems mean that even for countries which can eventually achieve self-sufficiency there is need for transitional arrangements to facilitate energy imports at adequate levels and reasonable prices; for those which do not possess sufficient energy resources, satisfactory import arrangements are needed on a permanent basis. There have been several recent pronouncements on the need to ensure adequate quantities of oil for OIDCs, and at the Third General Conference of UNIDO in February 1980, an OPEC official warned that in future the Organisation might have to curtail supplies to industrialised nations to meet domestic and developing nations' demands. In that connection it may be recalled that the Energy Commission of CIEC had recommended that, in periods of reduced oil supplies, the most vulnerable developing countries should be given priority to allow them to meet essential requirements. Similar proposals have been made elsewhere and it would seem desirable for OPEC or any global negotiation on energy to consider drawing up contingency plans to protect these countries in the event of scarcity. (IEA arrangements already exist to allocate oil supplies within member countries.)

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1. See also Brandt Commission Report, page 231, which gives an estimate of at least $4 billion annually, excluding electricity.

iv) Conclusion

30. Finally, it should be added that a lasting solution to the energy problems of the OIDCs will be found only in the context of a global accommodation between OPEC and oil-importing countries (including the OIDCs)and the general acceptance of a multi-faceted international strategy for energy. This is now seen as a major element of a renewed North-South dialogue, and will be on the agenda of the UN General Assembly Special Session in August-September 1980, which is to launch a round of 'global and sustained negotiations on international economic cooperation for development'. Elements of such an international strategy for energy should include the following: assurances of production levels by oil-exporting countries; special arrangements to ensure that poorer developing countries receive the amounts of oil needed; acceptance and implementation of ambitious conservation targets by major energy consuming countries; determination of oil prices at levels giving incentives for greater production and encouraging more conservation, and without sudden major increases; major investment in energy production within OIDCs; and greater R & D into alternative sources of energy.

IV. Energy conservation in energy net-importing developing countries

31. It would appear at first that the possibilities of conserving energy consumption in OIDCs are rather narrow, since the bulk of consumption in most of these countries is for 'essential' purposes, e.g. kerosene for domestic lighting and cooking, diesel for irrigation pumps and road freight services, and fuel oil for thermal electricity generation and for industrial process heating. Moreover most OIDCs are in the process of attempting to transform their economies from an agrarian subsistence basis to an industrial commercial basis, and as is well known, the energy-intensiveness of basic industrial activities is much greater than that of subsistence agriculture. Yet if the prospects of energy conservation through the elimination of wasteful usage and a lessening of the 'energy-structure' of the economy are in general relatively poor, those which can be achieved through technical improvement would seem very much brighter. The following paragraphs briefly review some of the sectoral prospects for energy conservation by OIDCs.

32. In the residential sector of these countries considerable economies in the consumption of kerosene and LPG can be achieved by the use of more efficient stoves and burners, and several countries (including India) have better designed appliances under development and trial. Similar economies are possible for wood-burning domestic stoves, while some countries have found the use of closed hearth fireplaces has reduced consumption of firewood.

33. The relative importance of the transport sector in OIDCs varies enormously, but in some of the middle-income countries there is considerable scope for the conservation of gasoline in private motoring. Such economies can be achieved in a variety of ways: some OIDCs have undertaken the mandatory closing of gasoline stations at weekends (e.g. South Korea); some have converted vehicle engines from running entirely on gasoline (mainly imported) to using a fuel which includes power alcohol from domestic agricultural materials (e.g. from sugar-cane for Volkswagon cars in Brazil); others have used fiscal measures to conserve consumption of gasoline (e.g. India), while quite a few of these countries, particularly in the Western Hemisphere, appear to have considerable potential for energy conservation through greater use of the pricing mechanism to foster the substitution of small

for large vehicles. Better vehicle maintenance would also save fuel. As regards rail transport, several OIDCs have saved energy through substituting diesel or electric traction for coal-fired locomotives; the problem in certain countries (including India) is that the coal was from domestic sources whereas most of the oil has to be imported.

34. For most OIDCs the commercial sector is not of great importance as a consumer of energy, but in some countries devices which save energy in that sector are nevertheless worth pursuing. They are particularly important for the more advanced OIDCs, some of which have taken measures to cut down the use of excessive lighting (e.g. South Korea) or to reduce the use of air-conditioning (e.g. Sri Lanka).

35. At present use of commercial energy in the agricultural sector of OIDCs is comparatively small, most being consumed in water pumping machinery. The importance of raising the efficiency of agricultural pumps has been recognised by many OIDCs and several are in the process of substituting electrical sets for less efficient diesel ones. Other countries are undertaking research into raising the efficiency of tractor engines or of using alternative and renewable sources of energy, e.g. solar-heated crop driers or rice husks in rice mills.

36. In the industry sector substantial economies are possible in the energy-intensive sectors such as steel (e.g. through raising the ratio of pellets to sinter in the blast furnace charge, raising the temperature of the blast furnace, reusing waste heat, etc.),cement (e.g. converting from the wet to the dry process), fertilizers (e.g. use of the Haber process for ammonia production), aluminium (e.g. use of the Alcoa process), etc. Several OIDCs are taking measures in this area (e.g. India in the conservation of coking coal in the coke ovens and blast furnaces). Finally, substantial economies are possible within the energy industry itself. Thermal generation of electricity, for example, becomes more efficient with larger sets, and the bigger OIDCs, such as India, are taking advantage of these scale economies. Many OIDCs are making efforts to reduce electricity transmission and distribution losses, which are particularly important if long distances are involved; others are also involved in raising the efficiency with which imported oil-based town gas is used (e.g. Singapore).

37. For OIDCs to make optimum use of the energy-conserving technologies already available or under development, increased technical cooperation is needed among these countries, as well as of assistance from the industrialised countries. Appropriate fiscal and financial policies are also needed internally, as well as suitable institutional and legislative arrangements. The energy conservation scope in these countries is considerable, and the potential benefit to their balance of payments is immense. For this to be realised will require the necessary commitment of resources and implementation of policies.

Table 1

Increases in developing countries' consumption of 'commercial' energy

(% annual averages)

	1951-60	1961-70	1971-73	1974-78	1974	1975	1976	1977	1978
Total	7.5	7.3	5.5	6.6	6.1	5.0	8.7	8.2	5.2
OIDCs	7.0	7.2	4.7	5.0	3.8	3.8	6.3	6.9	4.1
OEDCs	8.7	7.5	7.2	9.6	10.3	7.1	12.8	10.5	7.0

Source : UN World Energy Supplies.

Table 2

Some aspects of 'commercial' energy consumption in selected developing countries

(kg,coal equivalent)

	Per dollar of GDP		Per capita		Per dollar of GDP		Per capita
	1960	1976	1978		1960	1976	1978
South Korea	1.2	1.7	1,359	Somalia	0.2	0.4	99
India	1.3	1.6	178	Burma	0.5	0.4	64
Jamaica	0.2	1.5	1,823	Malawi	n.a.	0.4	52
Zambia	n.a.	1.3	474	Afghanistan	0.2	0.4	47
Pakistan	1.3	1.2	172	Tanzania	0.3	0.4	65
Colombia	1.3	1.2	700	Guinea	0.3	0.4	105
Chile	1.2	1.2	997	Mauritania	0.1	0.4	203
Liberia	0.2	1.0	395	Senegal	0.3	0.4	181
Jordan	0.7	1.0	535	Ivory Coast	0.2	0.4	357
Argentina	0.9	1.0	1,873	Guatemala	0.4	0.4	260
Dominican Rep.	0.3	0.9	464	Bangladesh	n.a.	0.3	43
Singapore	0.4	0.9	2,461	Ethiopia	0.1	0.3	20
Thailand	0.3	0.8	327	Mali	0.2	0.3	30
Philippines	0.6	0.8	339	Benin	0.2	0.3	56
Panama	0.7	0.8	991	Malagasy Rep.	0.2	0.3	n.a.
Uruguay	0.7	0.8	1,054	Togo	0.1	0.3	96
Honduras Republic	0.5	0.7	284	Cameroon	0.2	0.3	119
Hong Kong	0.7	0.7	1,657	Ghana	0.2	0.3	165
Israel	0.7	0.7	2,362	Congo	0.3	0.3	175
Kenya	0.8	0.6	139	Paraguay	0.2	0.3	200
Sudan	0.2	0.6	172	Chad	0.1	0.2	22
Papua New Guinea	0.2	0.6	292	Rwanda	n.a.	0.2	17
El Salvador	0.4	0.6	265	Upper Volta	0.1	0.2	25
Morocco	0.4	0.6	285	Niger	-	0.2	38
Nicaragua	0.4	0.6	517	Cent. African Rep.	0.1	0.2	44
Brazil	0.6	0.6	794	Uganda	0.1	0.2	48
Mozambique	0.4	0.5	151	Nigeria	0.1	0.2	106
Sierra Leone	0.3	0.5	100	Nepal	-	0.1	11
Sri Lanka	0.7	0.5	109	Burundi	n.a.	0.1	12
Costa Rica	0.4	0.5	564	Haiti	0.2	0.1	57

Source: IBRD World Development Reports and UN World Energy Supplies.

Table 3

Energy/GDP ratios for selected developing countries*

	1960-73	1974-76	1960-76		1960-73	1974-76	1960-76
Central African Rep.	n.a	2.4	6.7	Paraguay	1.9	1.2	1.6
Niger	n.a	n.a	5.8	El Salvador	1.4	2.4	1.5
Somalia	n.a	n.a	5.6	Bolivia	1.2	2.3	1.5
Sierra Leone	3.0[a]	11.7	5.1	Jordan	n.a	n.a	1.5
Malagasy Rep.	n.a	n.a	4.3	Panama	1.4	n.a	1.5
Nepal	7.2[b]	0.4	4.1	Saudi Arabia	n.a	n.a	1.5
Chad	n.a	1.4	4.1	South Korea	1.5	0.6	1.4
Jamaica	n.a	-1.1	3.3	Nicaragua	1.6	1.4	1.4
Liberia	5.5[b]	2.8	3.2	Tunisia	1.7	0.6	1.4
Ethiopia	3.3[a]	-2.3	3.0	Malaysia	1.9	n.a	1.4
Afghanistan	n.a	n.a	2.9	Costa Rica	n.a	1.8	1.4
Upper Volta	n.a	n.a	2.9	Iran	1.4	1.4	1.4
Algeria	n.a	n.a	2.7	Sri Lanka	1.3[b]	-0.5	1.3
Sudan	n.a	n.a	2.6	Indonesia	1.1	3.8	1.3
Ghana	2.5	n.a	2.5	Argentina	1.3	-0.7	1.3
Benin	n.a	n.a	2.3	Pakistan	1.2	0.3	1.2
Uganda	2.2	4.6	2.3	Ecuador	1.3[b]	2.4	1.2
Cuba	n.a	n.a	2.3	Libya	n.a	n.a	1.2
Mozambique	n.a	n.a	2.2	Burma	1.4[a]	0.2	1.1
Tanzania	2.1[b]	2.4	2.2	Cameroon	n.a	2.0	1.1
Mauritania	n.a	n.a	2.2	Colombia	1.1	n.a	1.1
Nigeria	n.a	n.a	2.2	Guatemala	1.1	1.7	1.1
Dominican Rep.	2.5	0.4	2.1	Peru	1.3[a]	1.9	1.1
Thailand	2.1	0.7	2.1	Taiwan	n.a	n.a	1.1
Senegal	n.a	n.a	2.1	Venezuela	1.2	0.5	1.1
Chile	n.a	n.a	2.0	Israel	1.1	-0.6	1.1
Haiti	2.2	1.1	1.9	Egypt	n.a	n.a	1.0
Honduras Rep.	n.a	n.a	1.9	Mexico	1.1	0.5	1.0
Ivory Coast	n.a	n.a	1.9	Brazil	0.9[b]	1.0	0.9
Trinidad &Tobago	1.4[c]	2.1	1.9	Uruguay	2.8	0.7	0.9
Mali	n.a	n.a	1.8	Guinea	n.a	n.a	0.8
Angola	n.a	n.a	1.8	Iraq	1.3[b]	0.4	0.8
Togo	n.a	n.a	1.8	Zaire	n.a	n.a	0.7
Philippines	1.9	1.1	1.8	Kenya	0.6[b]	0.4	0.7
Morocco	1.7	2.6	1.7	Congo	n.a	n.a	0.7
Syria	1.5	1.7	1.7	Hong Kong	0.8[a]	0.6	0.7
Singapore	2.0	0.7	1.7	Lebanon	n.a	n.a	0.2
India	n.a	n.a	1.6				

* Average percentage change in commercial energy consumption divided by average percentage change in GDP during different periods.

a Growth in GDP: 1963-73

b Growth in GDP: 1965-73

c Growth in GDP: 1966-73

Source: Computed from data in IBRD World Development Reports and UN Yearbook of National Accounts Statistics.

Table 4

Changes in the pattern of 'commercial' energy consumption (%)

	Solid fuels			Liquid fuels		
	1950	1973	1978	1950	1973	1978
DMECs	56.9	22.4	22.5	28.9	52.4	51.7
LDCs	38.9	15.9	15.0	55.4	67.2	66.8
World	61.5	31.7	32.0	27.0	46.3	45.2

	Natural gas			Primary electricity		
	1950	1973	1978	1950	1973	1978
DMECs	12.1	22.4	22.2	2.1	2.8	3.6
LDCs	4.3	13.4	14.1	1.4	3.5	4.2
World	9.8	19.6	19.8	1.7	2.4	2.9

Note: DMECs = Developed Market Economy Countries.
LDCs = Less Developed Countries.
World = includes Centrally Planned Economy Countries.

Source: UN World Energy Supplies.

Table 5

Estimated consumption of primary energy by sector in 1976 (%)

	'Commercial' energy			Total energy		
	DMECs	LDCs	World	DMECs	LDCs	World
Residential	16	24	18	18	34	20
Commercial, etc.	8	2	6	8	2	6
Agricultural	1	4	2	1	4	2
Industrial of which:	55	47	59	53	42	57
manufacturing	(23)	(21)	(30)	(22)	(19)	(29)
energy*	(28)	(20)	(25)	(27)	(18)	(24)
other**	(4)	(6)	(4)	(4)	(5)	(4)
Transport	20	23	15	20	18	15
Total	100	100	100	100	100	100

Note: DMECs = Developed Market Economy Countries.
LDCs = Less Developed Countries.
World = includes Centrally Planned Economy Countries.

* Consumption of primary energy in production of thermal electricity, manufactured gas, petroleum products, coal products, etc.

** Mining, building and construction.

Source: Commonwealth Secretariat estimates.

Table 6

Commercial energy - import dependence and consumption of selected developing countries

	Countries	Population	GNP per capita*	Energy consumption per capita*	Energy consumption	Net imports of energy	Net imports as proportion of consumption
	(no.)	mid-1977 (millions)	1977 ($)	1978 (kg)	1978 (mtce)	1978 (mtce)	1978 (%)
Net importing countries							
> 75% import dependence							
p.c. consumption							
< 200 kg	28	201.5	201	66	13.5	13.2	98.1
200-1000 kg	15	147.7	529	349	49.7	48.1	96.7
>1000 kg	8	51.5	1,162	1,425	72.7	64.3	88.5
25-75% import dependence							
p.c. consumption							
< 200 kg	3	156.2	138	105	16.9	7.4	51.6
200-1000 kg	5	198.3	1,194	815	157.5	105.7	67.1
>1000 kg	1	21.7	1,960	2,035	44.6	18.4	41.4
< 25% import dependence							
p.c. consumption							
< 200 kg**	6(5)	736.5(104.8)	154(179)	169(112)	125.3(11.7)	24.0(0.8)	19.2(6.8)
200-1000 kg	0	-	-	-	-	-	-
>1000 kg	1	26.0	1,730	1,873	49.4	8.2	16.6
Net exporting countries							
p.c. consumption							
< 200 kg	5	123.2	341	94	9.8	-129.4	-
200-1000 kg	9	247.9	522	435	106.5	-386.0	-
>1000 kg	12	126.6	2,214	1,873	239.9	-1,631.4	-
TOTAL	93	2,037.1	433	440	885.8	-1,127.7	-
of which:							
Net energy importing developing countries	67	1,539.4	414	347	387.0	289.2	74.7

* Weighted average. ** Figures in brackets denote totals excluding India.

Source: UN World Energy Supplies, IBRD World Development Report, UN Statistical Yearbook.

SOME CURRENT ISSUES IN COMMODITIES, FOOD AND AGRICULTURE

Economic Affairs Division
Commonwealth Secretariat

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Some Current Issues in Commodities, Food and Agriculture

CONTENTS

A. Commodities : Production and Trade

I. Introduction

1. Commodities are responsible for a large proportion of the exports of developing countries - about 60 per cent if oil is excluded. In terms of production, primary products loom larger since a higher proportion of locally consumed food in these countries is domestically produced. Although the exports and production of manufactured goods are increasing faster than those of commodities, the much larger primary products sector in developing countries - whether through its expansion or other improvement - clearly has a large role to play in economic development.

2. The question arises on what areas in the commodities sector should one concentrate to achieve the increased contribution to economic development? This note attempts to provide some broad guidance on this issue. In existing international discussions and related documents, the distinction is usually made between commodities and food in primary production - the former being concerned with the export of raw materials and food and the latter with the problem of domestic food production. This division is maintained here. Although it is artificial and it becomes blurred in some areas e.g. the large importance of exports of some food products by developing countries, the distinction has convenience in terms of problem orientation. This Section is concerned with commodities in the narrower sense of the export of raw materials and food products and excludes the problem of local food production which is dealt with in Section B.

3. In the past, attention has focused on price stabilisation and price enhancement in commodity export trade, and international discussions and negotiations have concentrated in the last five years - in the preparatory work for UNCTAD IV and in subsequent negotiations - on these aspects. But these are not only the important aspects of commodity development. It has been argued that in some other areas, greater contribution could be made to economic development. As a result of UNCTAD IV, machinery has been set up for detailed negotiation of price control arrangements for commodities - the establishment of new International Commodity Agreements (ICAs) and a financing mechanism (the Common Fund) for support of ICAs. This provides additional reasons for attaching great importance now to priorities for international attention in other aspects of commodity development. After describing and assessing the present situation regarding price stabilisation arrangements, consideration is given to income stabilisation measures, processing and marketing, investment and trade barriers.

II. Price Stabilisation

4. In the post-war period, the establishment of ICAs has been seen as important for the achievement of price objectives in commodity export trade. However, by the early 1970s failure to make much progress in the establishment of ICAs and to achieve satisfactory results from the few which have been established, led to the support of new approaches by developing countries to the regulation of international commodity trade. Thus at UNCTAD IV in 1976, one of the main issues for discussion was a proposal to establish an Integrated Programme for Commodities, the main elements of which were a Common Fund to finance buffer-stocks and other price stabilisation measures

and the setting up of ICAs for an open-ended list of commodities which were significant in the export trade of developing countries - 18 of which were specified.

5. The Conference adopted a Resolution to establish such an Integrated Programme and set up machinery for its negotiation with a timetable for completion by the end of 1978. This timetable has had to be revised. The situation now is that agreement was reached in March 1979 on the broad financial and administrative structure for the Common Fund but negotiations on the details have become protracted. It is hoped, however, that negotiations on the Draft Articles of Agreement will be completed at a final negotiating conference in May 1980.

6. As regards the ICAs, only one agreement has so far been established under the IPC - the International Sugar Agreement - and this was a case of the renegotiation of an agreement that was in existence. But even in this case its operation has been handicapped by the non-participation of the US and the EEC. The US is now about to obtain legislative approval to join, but no great progress has been made in obtaining EEC membership. Another agreement - for natural rubber - has been successfully negotiated and is expected to come into operation in October 1980.

The Common Fund

7. The original proposal of the developing countries was for a Fund of $6 billion, $3 billion in the first instance and moving up to $6 billion as necessary. Of the amount of $3 billion, $1 billion would be subscribed by governments direct to the Fund and the remainder would be raised by loans. ICAs would be able to obtain from the Fund all their financial requirements. The developed market economy countries tended to be against such an arrangement in that for them it implied too strong a dependence on the Fund by the ICAs.

8. After protracted negotiations, agreement was reached in March 1979, on the main broad financial structure of the Fund. The Fund would have two windows - the First would finance buffer-stocks held by ICA. It will be provided with a capital subscription from governments of $400 million, $300 million of which would be made up of cash and callable capital. Capital subscriptions would also be made by the ICAs themselves, in fact they would pay in full or in stages one-third of their estimated maximum financial requirements. The remainder of the capital needed by the Fund to meet the full financial requirements of ICAs, would be borrowed from capital markets and to assist such borrowing guarantees would be provided directly to the Fund by member governments of ICAs.

9. The Second Window of the Fund will finance other measures aimed at improving the structural conditions of markets and the long-term competitiveness and prospects of particular commodities. Such measures would include research and development and assistance for vertical diversification and would be supported within the framework of international commodity arrangements. The Second Window would be provided with resources from direct government contributions of not less than $70 million and voluntary contributions to meet a target of $ 280 million.

10. Besides these broad financial provisions, agreement has been reached in principle that voting rights would be distributed so as to give the developing countries, including China, 50 per cent of the votes. This would provide the developing countries a significant voice in the management of the Fund. However, voting majorities of 75 per cent would be required for some major decisions.

11. Although the broad financial and voting structure of the Fund has been settled since March 1979, the detailed provisions are proving difficult to negotiate and completion of the negotiations is therefore being delayed. Some of the outstanding issues are :

a) the distribution of assessed contributions and the phasing in of payments of them ;

b) the uses of callable guaranteed capital and circumstances under which it can be called ;

c) limits on the Fund's borrowing and the question of borrowing for the Second Window ; and

d) financial relationship between the two windows.

Progress in the Negotiation of ICAs

12. Of the eighteen commodities listed in the Integrated Programme for Commodities, international commodity agreements exist for only six (coffee, cocoa, tin, sugar, rubber and olive oil). Of these only one, rubber, is completely new (though the agreement is not yet in force - due October 1980); sugar has been renegotiated, but its full operation delayed by the hold-up in United States ratification; olive oil, also renegotiated, has wider scope than hitherto, but still no substantive or obligatory economic provisions; cocoa is proving difficult to renegotiate; coffee has completed half of its six-year term without its stabilisation quota mechanisms being called into action; tin, the longest standing agreement, has been strengthened by wider consumer country contributions in recent years, but has been without stocks since 1977. Negotiations for a new tin agreement open next month.

13. Negotiations on other commodities remain in the preparatory stage. Discussions within the UNCTAD framework have yet to begin on bananas (where, however, preliminary consideration is being undertaken under FAO auspices) and on bauxite. For some other commodities the preparatory meetings have made little progress in determining the price stabilisation mechanism that might be appropriate (manganese, phosphates, iron ore); successive meetings in cotton and copper have failed to clarify the appropriateness of stocking measures, and in vegetable oils the limited scope for stocking policies has led to so far unproductive consideration of alternatives. A second discussion is only now scheduled in 1980 for meat, following the outcome of discussions on this subject in the context of the GATT multilateral trade negotiations. Consideration of the possibilities for tropical timber remains in the exploratory stage. Some pointers toward agreement have emerged in the case of jute, hard fibres and tea, on which discussions will continue in 1980.

14. Inappropriateness of stocking measures as an instrument of stabilisation for some commodities, and the difficulty of agreement on their suitability

in other cases, have directed more attention to the possibility of concluding international commodity agreements based on institutional arrangements other than stocking, for some of which the establishment of the 'second window' of the Fund has relevance, e.g. research into production techniques, productivity and cost reduction, increased processing and new markets and market promotion. Such considerations have come to the fore in the discussion on vegetable oils, jute, hard fibres and tropical timber.

15. Although progress has been slow in negotiating the Common Fund and International Commodity Agreements, machinery has been set up for such negotiations. Questions now of special concern are : (a) how progress can be advanced and (b) which particular types of stabilisation arrangements deserve priority attention.

16. In the IPC, great emphasis has been given to buffer-stocks and their financing. For a number of commodities which are storable and depending on the degree of volatility, buffer-stocks are no doubt appropriate and in some cases may be superior to other stabilisation mechanisms. In the instance of such commodities the need for adequate financing arrangements to encourage the establishment of ICAs is emphasised.

17. So far the slow progress in the negotiation of ICAs has been due partly to the emphasis given to buffer-stocks and the fact that this stabilisation mechanism has been regarded as not being suitable for some of the commodities for which it was originally envisaged. This raises the question therefore whether greater attention should not be given to other price stabilisation arrangements, especially those which are less difficult to administer. Some which deserve consideration are :

a) Export taxes ;

b) Long-term multilateral contractual arrangements ;

c) Supply management through variable export quotas ; and

d) Price control arrangements which concentrate on the defence of a floor price rather than the fixing of price ranges.

III. Export Earnings Stabilisation

18. Two export earnings stabilisation schemes are in existence - one global and the other sub-global. The global scheme is the IMF Compensatory Financing Facility which is concerned with helping to stabilise the total export earnings of countries and not their commodity export earnings. Compensation is provided for shortfalls from trend levels but for a country to be eligible for such compensation, it must have a balance-of-payments problem. Compensation very often does not cover total shortfalls since there is a ceiling on drawings of 100 per cent of a member's IMF quota. Repayment must be made within 5 years but no repayment is expected in the first three years unless an earnings surplus is realised during that period. The main improvements of the Facility in recent years have been increases in the ceiling on drawings and widening the coverage of earnings to be stabilised. At the option of the member concerned, receipts from travel and workers' remittances could now be included in the export earnings to be stabilised.

19. The other scheme - Stabex - is a modest one under the EEC/ACP Lome Convention. Its beneficiaries are the African, Caribbean and Pacific countries which are members of the Convention. Eligibility for compensation is based on shortfalls of export earnings from the individual commodities covered in the scheme. However with the exception of iron ore only agricultural commodities are covered. The exclusion of other minerals considerably reduces the capital requirements of the Scheme and the extent of relief provided.

20. In the new EEC/ACP Convention which comes into force in March 1980, Stabex has been improved. The product coverage has been extended from 34 to 44 commodities. However the continued exclusion of minerals in spite of strong pressure for their inclusion from ACP states means that the Stabex Fund remains very modest - $750 million being provided for the five year period 1980-1985. Unlike the IMF Facility, Stabex credits do not attract interest charges. Repayments are made only when surpluses are earned but they should be completed within seven years. A further liberal aspect of Stabex is that transfers to the least developed countries are treated as grants. However, except for a small number of specially disadvantaged countries which are allowed compensation for global exports, the exports covered are those to the EEC and optionally those to other ACP countries. In neither the IMF Facility nor Stabex is any attempt made to include in shortfalls declines in the terms of trade. There is the further problem in the case of Stabex that the trend levels on which shortfalls are determined are based on a historical period - the past four years - and would therefore not reflect adequately current export earnings especially in view of present high rates of inflation.

21. As a concession to the request by the ACP states for the inclusion of minerals, the new Convention includes a mineral assistance scheme which would provide soft loans for rehabilitation where there is a significant decline in production or export capacity. Six minerals are covered, but this scheme is also very modest in intention. This is indicated by its capital fund which is $380 million for the five year period.

22. Stabex is, in its geographical and commodity coverage, a very limited scheme. In any case it has just been renegotiated. Attention at this stage must therefore be focused on global requirements to meet shortfalls in commodity export earnings.

23. The IMF Facility is not commodity related. Moreover it does not provide for total shortfalls. Where there is a shortfall on commodity export earnings but no total export shortfall, no compensation is provided. While in such a situation no payments deficit may be entailed, the problems posed for the commodities sector by the shortfall would receive no relief. In view of this and the quota ceiling which applies to the scheme, the Facility is clearly not intended to provide for, nor does it encourage provision of, income stabilisation within the commodities sector. To the extent therefore that earnings stabilisation is deemed to be required within the commodity sector, this scheme is not geared to meeting such a need although it addresses itself to the foreign exchange element of the problem.

24. Some developed countries feel that export earnings stabilisation should play a greater role than price stabilisation in commodity trade regulation. While developing countries do not see export earnings stabilisation as a substitute for price stabilisation, they nevertheless see it as

providing a strong complementary role - stronger than that played by present export earnings stabilisation schemes. Improvements in export earnings stabilisation provision would therefore seem to offer scope for convergence of positions and agreement in international negotiations. Conversion of the IMF Facility into a more commodity related scheme faces the problem of conflict with basic IMF objectives which are oriented towards the solution of balance-of-payments problems.

25. Because of this, proposals have been put forward for a new global scheme which would be complementary to the IMF Facility. In the past, the developing countries, while recognising the need for improved export earnings stabilisation arrangements, tended to be cautious in accepting initiatives which might provide substitute arrangements for ICAs. Now that machinery has been established however for serious negotiation of ICAs, the time might be ripe for serious consideration of the global needs for commodity export earnings stabilisation. In the past the approach has been too much in terms of possible improvements to the IMF Facility and the forums mainly concerned - the IMF or the Bank/Fund Development Committee- have encouraged this approach. A new approach, one which looks at the commodity problem globally and the present IMF Facility in the context of that problem, and one which could be discussed in a less committed forum, would seem to be required.

26. In recent years, West Germany and Sweden have put forward proposals for a new global commodity related export earnings stabilisation scheme. However serious discussion of these has taken place only in the IMF and in the Development Committee where they do not seem to be getting the depth of consideration they deserve.

IV. Processing and Marketing

27. In view of the large proportion of exports of developing countries made up of primary products, the further processing of these products domestically must offer substantial scope for the promotion of the economic development of these countries.

28. The UNCTAD Secretariat has recently estimated on the basis of 1975 trade data, that for ten selected commodities, local semi-processing could provide the developing countries with gross additional export earnings of $ 27 billion per year, more than one-and-half times the existing export earnings from these commodities.

29. Some progress is already being made in transferring processing activities to developing countries. However several factors point to the need for increased attention to further processing to advance economic development. First of all, while comparative advantage in developing countries is limited by such factors as high capital-labour ratios, scale economies, and the technological demands of processing activities, there are also favourable factors such as large weight reduction in processing in some commodities, security of supply of raw materials and the benefits that accrue from less volatile prices and incomes. The availability of energy in some developing countries surplus to domestic requirements, and the energy intensive nature of some forms of processing provide further scope for the expansion of processing in these countries based on multi-country ventures using complementary resources.

30. However, whatever the scope based on existing or changing comparative advantage, the fact remains that substantial artificial constraints to processing expansion in developing countries continue to exist in the form of high effective protection through tariff and freight rate escalation.

31. The importance of domestic processing as a means of promoting economic development is enhanced by the present difficulties being faced by the more labour-intensive types of export manufacturing through increased protectionism in the industrialised countries. Although some of these industries e.g. clothing and shoe making, are sometimes based on imported materials, low capital-labour ratios tend to give developing countries a comparative advantage in their production. However growth rates in exports of these industries have been reduced in recent years by the related factors of recession and protectionism and while priority must continue to be given in international development policies to the reduction of protectionism, account must be taken of the scope for processing industries based on the possession of raw materials and the bargaining power with transnational corporations and developed countries that might go with the availability and production of these raw materials.

32. Besides expanded processing, developing countries have also been demanding an increased role in the marketing of their raw materials. Additional down-stream processing increases the scope for greater participation in marketing also but further progress in this area depends on increased resource transfers from the multilateral development institutions which would enable developing countries to reduce the dominant role of transnational corporations in the exploration of minerals and in the establishment of raw material and processing production ventures. But progress in greater participation and control in the marketing of raw materials and processed products also depends on joint action by the producing countries to increase their bargaining power against large and what are often oligopsonistic transnational corporations.

33. The removal of artificial barriers to the expansion of processing in developing countries such as tariff escalation deserves serious consideration in international trade policy. For a number of commodities - copper, wood products, vegetable oils - effective protection remains very high and has not been significantly reduced by the Generalised System of Preferences or the various rounds of the MTNs.

34. The high capital requirements of some processing ventures and the tendency to maintain excess capacity are other factors which provide scope for international action to facilitate the feasible relocation of processing activities in developing countries. Consideration might be given to long-term adjustment and investment planning policies which might be appropriate for facilitating processing and also to the possibility of improvements in the lending policies of multilateral development institutions to facilitate financing, and participation of developing countries in the financing of processing and marketing ventures in developing countries.

V. Investment in Mineral Exploration and Development

35. Developing countries are now receiving a small proportion of total world investment in non-fuel mining exploration and development, particularly equity investment. According to World Bank estimates, 80 per cent of total

expenditure on exploration in market economy countries between 1970 to 1973 was concentrated in four developed countries. This is in spite of the fact that comparatively large areas of developing countries remain unmapped and there is a higher probability therefore of successful exploration in them.

36. The present situation has generated concern since it means that the full potential for cost reduction in securing mineral supplies is not being realised and that for the future, there is a threat of artificially induced scarcities for some minerals. In the non-fuel mining industry the view is fairly widely held that unless expenditure on new mining capacity begins to accelerate soon, supplies of some essential minerals will fall short of demand in the late 1980s since it takes about ten years or more to develop a new mine.

37. The main cause of the present position is the perception of high political risks in investment in mineral exploration and development in developing countries arising from nationalisation, unilateral renouncement of contracts and frequent demands for the renegotiation of terms.

38. Although the situation has been portrayed and is widely seen as one of great irresponsibility on the part of the governments of developing countries, the problem is not that simple. In many cases the contracts negotiated have proved very inequitable because of the circumstances in which they have been negotiated. Besides the general problem of unequal bargaining power, skill and access to information, a further issue has been that conditions of exploitation tend to be negotiated before exploration takes place, and they are usually geared to take into account the world-wide risks of exploration of the transnational concerned and to provide adequate returns to exploration and development on a global basis.

39. Although it seems reasonable that a mining company should want returns from successful exploration ventures to cover for the failed ventures, because of the high risks of exploration, this tends to require high profits from successful ventures. This means that often poor countries are put in a position where they see their known reserves being exploited at considerably reduced benefit to them. The pressure in such countries for revenue for other development projects puts a strain on such contracts which are seen as inequitable in the local context - if not in relation to the ex ante risk then in relation to poverty and urgency for development. In such a situation, demands for renegotiation become understandable.

40. The issue is seen as wholly one of 'political' risks. However the matter is more complex and very often has to do with the commercial consideration that the information available at the stage of the negotiation of the contract to the host country or to both parties has been inadequate for the negotiation of a stable long-term contract.

41. The situation has been aggravated by the steep increases in recent years of the investment requirements of individual mining projects. What is clearly required are improved contractual arrangements that would take into account the special circumstances and risks involved and would incorporate the required degree of flexibility. Some recent developments have been the increased use of joint ventures involving more than one mining company and the host country in order to spread the risks, and of management and marketing contracts on the part of the mining companies instead of equity participation.

42. This process of reform and improvement in the contractual arrangements must continue. An important recommendation of the Brandt Commission is for separation for contractual purposes of the exploration and development stages, and the avoidance therefore of host countries entering into long-term contractual arrangements at a stage when the extent of reserves and their quality are not known. The Brandt Commission puts forward the novel idea that the exploration for minerals in developing countries should be seen as a responsibility of consuming and producing countries and that financing of exploration should be a responsibility of the international community. They recommended that a financing facility should be set up for this purpose. According to the Report "until mineral development and exploitation agreements can be negotiated on the basis of assured and equally shared knowledge about the extent and potential value of deposits, concession agreements are bound to be unstable. It is a necessary feature of the traditional-style agreement that whenever a really rich deposit is discovered, a country's non-renewable resources will appear in retrospect to have been signed away too cheaply and the popular demand for renegotiation will be irresistible. The need is therefore for a multilateral financing facility to provide resources which can be converted into a loan and part of the initial financing of the project if a commercial deposit is discovered, developed and exploited. The existence of this multilateral facility would reflect international responsibility for and a common interest in mineral exploration".

43. The international financial institutions have in recent years been giving greater support to mineral development schemes. This is a welcome development since the World Bank, IDA, IFC and regional development banks can help bridge the differences between host countries and foreign mining concerns by providing an international 'presence' in mining ventures. Financing from these institutions could help to reduce dependence on the transnational corporations and can help to provide a more secure environment for foreign private investment. However, as yet the level of lending from the World Bank, at about $ 500 million per year, is small in relation to needs and very little financing has so far been given for exploration.

44. Financial assistance is also being provided by the UN Revolving Fund for Natural Resources Exploration but only a meagre amount of resources have been made available to this institution, and even this amount it has found difficult to dispose of because of the unattractive conditions attached to its support.

45. The problem of inadequate investment in raw material production has not been confined to non-fuel minerals. Energy generally is a special case and its problems have been dealt with in separate papers.(1) The problem also involves agricultural raw materials and food.

46. According to the estimates prepared by the FAO for the World Food Conference in 1974, it was found necessary to double the existing flow of investment in agriculture to $16 - $ 18 billion per year (in 1972 prices) over 1975-1980 in order to raise the growth rate of agricultural production in developing countries to 4 per cent annually. The requirement for external capital assistance to agriculture was put at $5 - $6 billion annually (in 1972 prices). This target was however never reached. At 1975 prices, it was

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1. See pages 107 - 161.

recalculated at $8.3 billion. However, in 1977, the amount reached at 1975 prices was $4.3 billion, just over one-half the target. It is not surprising therefore that the 4 per cent growth rate for food production has not been reached and the food security situation in developing countries, although improved since 1974, is still precarious.

47. A large part of the external capital requirements for agriculture is in the form of concessional assistance. However, aid levels as a percentage of GNP remain fairly stagnant and although the international financial institutions have been paying greater attention to the needs of the agricultural sector, the investment target for agriculture remains unrealised.

48. Urgent consideration is needed to ways in which investment in mineral exploration and development could be accelerated. Special attention should be given to improving contractual arrangements to take into account the special circumstances and risks involved, and the need for flexibility and for the wider spreading of risks, and for separation of exploration and development in contractual arrangements. Many developed countries provide official facilities for political risk insurance. The further development of these facilities, and the need to establish them at international and regional levels, may also be worth considering.

VI. Trade Barriers

49. Protectionism by developed countries against the products of developing countries tends to be discussed mainly in relation to manufactured products. However it is significant in relation to the commodities sector. A study carried out by the World Bank in 1975 which attempted to assess the possible gains for developing countries by the removal of trade barriers in OECD countries for nine agricultural commodities - beef, bananas, cocoa, coffee, tea, sugar, cotton, hardwood products and citrus fruits - showed that the growth rate of export earnings for these commodities up to 1980 would rise to 15 per cent compared to projections of 12 per cent without the removal of the trade barriers. In f.o.b. value terms, this would have meant additional earnings of $7.1 billion per year (in 1974 dollars). Two-thirds of these gains were accounted for by three commodities - sugar, citrus fruit and wood products.

50. The domestic agricultural policies of many developed countries - e.g. the CAP of the EEC - remain very protective and because of these policies not much progress has been made in the several rounds of the MTNs in reducing trade barriers in this sector.

51. Some of the agricultural products which face high trade barriers and which are of significant export interest to developing countries are sugar, beef, vegetable oils, cotton and tobacco. In the case of sugar, increasing consumption is concentrated in the developing countries. Yet in recent years under arrangements which provide for high internal prices and internal markets insulated from outside competition, the EEC has build up surplus production which, with high subsidies, it has been dumping on the world market. And in the last two years, it has been benefiting in the world market at the expense of other exporters, mainly the developing countries, who have been restricting their supply to the world market under obligations which arise from membership of the International Sugar Agreement which the

EEC has so far not joined. Besides high tariff barriers, developing country exporters face health and sanitary regulations which are also sometimes protective in intent.

52. But barriers do not exist only against these competitive products, they affect also non-competing tropical products such as tea and coffee. In some cases protection takes the form of tariff escalation to shield processing industries but in other cases it stems from internal taxes which traditionally arose from fiscal considerations.

53. Tariff escalation arises not only in the case of agricultural products - it affects also minerals. And in many cases the GSP or the several rounds of the MTNs have made little impact in reducing high effective protection on processed products. This is because under the GSP, the unilateral determination of the concessions and the various restrictions under which they are circumscribed have resulted in severe limitations on the concessions in areas of great interest to the developing countries. In the case of the Tokyo Round of the MTN, which was supposed to give special attention to the developing countries, the bilateral offer and request system used in the negotiating process prevented the negotiations from giving the intended attention to the products of interest to the developing countries.

54. Some trade liberalisation of benefit to developing countries has resulted from the MTNs. In the area of tropical products, most of the concessions obtained have already been implemented. Detailed assessments of the results are now taking place. However, the indications so far are that the Tokyo Round of the MTNs has far from lived up to its stated objective of providing special and differential treatment for developing countries.

55. Tariff escalation constitutes an artificial constraint to the expansion of processing in developing countries. It is a problem which would seem to deserve special attention in trade negotiations. Developing countries claim that freight rate escalation is also a problem. This needs investigation with a view to providing information which could help in the negotiation of more rational freight rates.

56. Greater attention must be given to the liberalisation of agricultural trade. Progress would be slow because of conflicts with domestic agricultural policy objectives. In the meantime consideration might be given to developing special arrangements for preferential treatment to developing countries. Since free access might in some cases disturb internal price objectives, quota allocations might be used to assist developing countries.

57. Tropical products do not compete with local products in developed countries and fiscal considerations could not provide an adequate justification for internal taxes on these products. Consideration should therefore be given to the immediate abolition of all trade barriers on non-competing tropical products.

B. Issues in Food and Agriculture

I. The Food Problem

58. According to the Report of the Brandt Commission, about 800 million people in the Third World are destitute and barely surviving - most of these are chronically malnourished. Seventy per cent of the poor in developing countries live in rural areas. Agriculture provides 44 per cent of the GDP of the poorest countries and 83 per cent of their employment. The food gap in developing countries is increasing. By 1990 it is estimated that the developing countries could be importing as much as 145 million tonnes of food of which 80 million tonnes will be required by the poorest countries of Africa and Asia. These will add severe strains on the balance-of-payments of many of these countries. While the world food situation has improved since the serious crisis of 1974, the food security situation in developing countries remains precarious.

59. These statistics confirm the prevailing view among development economists that agriculture has a crucial role to play in economic development especially at the early stages and therefore for the poorest countries. Even at more advanced stages, the right balance between agriculture and manufacturing could be very important in securing even and sustained economic development.

60. The Statistical Annex to this paper gives some more detailed indications of the evolution of the food problem in the last decade. Food production in developing countries only increased by 3 per cent per annum in 1970-1978, as against a targeted increase for the Second Development Decade of 4 per cent. The rate of increase has been lowest in Africa and not very encouraging in the Far East. On a per caput basis (as set out in Table 2) the period 1970-1978 saw an annual average increase in food production of only 0.6 per cent in all developing countries. In Africa per caput food output fell by 1.2 per cent per annum, while the increase in the Far East was only 0.4 per cent. In the Most Seriously Affected (MSA) countries there was an annual fall in per caput food output of 0.2 per cent. The situation was worst in the African MSA countries, but also serious in the Near East and scarcely encouraging in the Far East or in Latin America. Some recently published statistics of per caput food production in the Least Developed Countries (LLDCs), insufficiently detailed for inclusion in the Statistical Annex, show an even worse situation than in the MSA countries as a group. In these countries per caput food output fell by no less than 0.5 per cent per annum in 1970-1978; in the LLDCs of Africa West and Central the annual reduction was 0.8 per cent.

61. The Brandt Commission laid special emphasis on the food problem and included it as one element of its Emergency Programme for 1980-1985. While attaching importance to food security measures such as food aid and the need for reserves, the Report paid particular attention to the need to accelerate food production in the developing countries. Briefly the food programme would aim at :

i) increased food production, especially in the Third World, with the necessary international assistance ;

ii) regular supplies of food, including increased emergency food aid ; and

iii) a system for long-term international food security.

II. Food Security

The current world cereal supply situation

62. There has been some slight deterioration in the current (1979-1980) season, world production of 1,408 million tonnes being 4 per cent below last season's record, while world exports are seen as increasing by 10 per cent to 184 million tonnes. Nevertheless the decline in total world end-season stocks will be modest, despite a 10 per cent fall in wheat stocks and a moderate reduction in those of rice.

63. Current world cereal stocks meet the minimum FAO food security requirement of 17-18 per cent of total consumption but there is growing concern about their accessibility, since a large proportion is in exporting countries while the share held by importing countries has fallen. Since transport facilities in North America are already working to capacity, sudden crop failures in the developing world could not necessarily be overcome in time by drawing upon North American stocks. United States measures to maintain cereal prices following the suspension of grain sales to the Soviet Union have generally been effective, so developing countries, notably the MSA countries, whose current import requirements for 1979-1980 are up by some 10 per cent at 18.6 million tonnes, will gain little price benefit from the export ban. First reports of the prospects for autumn-sown Northern Hemisphere cereal crops are good; the United States is not to introduce a paid acreage diversion programme for 1980.

The new International Grains Arrangement

64. Negotiations for a new International Grains Arrangement with substantive economic provisions were finally adjourned sine die in February 1979. The International Wheat Council concluded in November 1979 that there was little chance of negotiating a new Wheat Trade Convention on the basis of the preceding negotiations. Although the negotiations had finally broken down on three issues, the Negotiating Conference should not be seen as a complete failure, since understanding was reached on the broad principles of the new Arrangement, and indeed on a Consultative Coarse Grains Convention and on a new Food Aid Convention (q.v). There only remained three areas of broad disagreement. First was the question of the trigger prices; these would almost certainly have to be higher in any discussions on a new Wheat Convention owing to the subsequent rise in energy and other costs. Secondly, there was a disagreement on the size of the reserve, with the United States wanting it to be about 30 million tonnes, but most other countries seeing a much smaller one as more desirable. Lastly, the developed countries were unwilling to agree to a special fund within the Arrangement to help developing countries acquire and hold reserves and build storage facilities. Developed countries only favoured a body to evaluate storage needs in individual countries and to recommend appropriate action to donor countries and international organisations. The acquisition and storage costs for developing countries to hold 5-7 million tonnes of a 20-30 million tonnes world reserve were roughly estimated at about $1.75 billion. The gap between developed and developing countries in this area was wide.

65. Since discussions last November indicated that there was little likelihood of a new Convention being negotiated on the basis evolved in the 1978-1979 Conference, a Special Committee was requested to consider alternative arrangements and to report to the session of the IWC in June 1980.

The United States suggested in November 1979 that negotiations might be resumed in 1980 on the basis of a smaller reserve than 30 million tonnes, but other nations do not seem publicly to have responded to this idea.

The International Emergency Food Reserve

66. The International Emergency Food Reserve which the international community agreed to establish was to consist of a permanent reserve of 500,000 tonnes of cereals, replenished as required each year. Although formally established in 1976 it had only received 306,000 tonnes in 1979. An adequate mechanism for replenishment of the Reserve is still urgently required. Many believe that an emergency reserve of 0.5 million tonnes is too small, and that a minimum of 750,000 tonnes will be needed early in the eighties.

Food Aid and the Food Aid Convention

67. Table 5 of the Statistical Annex shows that the 10 million tonnes a year of cereal food aid recommended by the World Food Conference in 1974 has yet to be achieved. Indeed in 1979-1980 the volume of food aid declined.

68. Much of the food aid is channelled through the Food Aid Convention (FAC) which is attached to the present International Wheat Agreement. In spite of slow progress in negotiating a new Grains Arrangement, a new FAC on much the same lines as its predecessor, was signed in March 1980. This followed undertakings last year by existing donors and two new ones to higher commitments of some 7.6 million tonnes of cereals to food aid as against the 4.2 million of the 1971 Convention. This temporary abandonment of the parallelism between the Food Aid and Wheat Trade Conventions of the International Wheat Agreement should make it possible for food aid in 1980-1981 to increase although preliminary estimates suggest that it will still fall short of the 10 million tonnes target set by the World Food Conference. The immediate objective should be the attainment of the 1974 target. In the longer-term serious consideration should be given to increasing the Food Aid target, which was determined arbitrarily in the past and bears no relationship to the gap in developing countries between consumption and minimum nutritional requirements.

69. Other areas where progress is still required in food aid relate to the adoption of forward planning, an increase in the element of concessionality, greater provision of food aid on a multilateral basis and the development of an improved policy framework for food aid. As yet only a small part of total world food aid has been earmarked for the creation of food reserves and storage facilities in developing countries.

A Food Import Financing Facility

70. No institutional arrangements exist to meet unexpected steep rises in the food import bills of the poorer developing countries caused by local harvest failures or world food shortages. Food aid is not provided on a flexible enough basis to meet this problem which could be very serious, and in the past has resulted in reduced consumption where malnutrition is already severe. The FAO Conference of November 1979 invited the IMF to consider the feasibility of providing assistance to poor countries facing higher food

import bills. Other suggestions include a separate financing facility for food imports, a variable food aid programme and an international food insurance scheme. The absence of international arrangements to meet this problem would seem to constitute a serious gap in international development cooperation.

III. Aid to Investment in Food and Agriculture

71. Performance in recent years continues to be seriously behind requirements. The problem has two aspects. First, there is an urgent need for developing countries, especially the poorer ones, to increase their own investment in agriculture. Current investment rates in food and agriculture in developing countries are estimated to be only half the overall investment rates for their economies as a whole. The World Bank estimates that developing countries' investment for food and agriculture should be increased from the current 7-8 per cent of total domestic product to 11-12 per cent by 1985; for food production alone internal investment needs to be doubled in the next five years. The need is most pressing in the poorer countries, which normally invest less in agriculture in relation to agricultural GDP than better-off countries.

72. The second aspect relates to the need for substantial external assistance to food and agricultural production in developing countries. At a rough approximation about a quarter of developing countries' needs in this sphere require to be met by external assistance. In 1977, when in real terms aid to agriculture in the 'narrow' OECD 'food' definition increased by some 30 per cent, total official assistance, at some $4.3 billion (in 1975 prices) was only about half the $8.3 billion recommended by the World Food Conference. In 1978, according to preliminary data, ODA increased very little in constant 1975 prices so that the shortfall remained at about half of estimated requirements. Thus, aside from the long-term recommendations of the Brandt Commission, there is also the minimal need in the next two or three years to raise the flow of external resources to the real level recommended in 1974.

73. Two aspects of external assistance to food and agriculture require special mention. During the first two years of its operation (1978 and 1979) the International Fund for Agricultural Development (IFAD), whose objective is to help the most needy countries to increase their food production, loaned $500 million of its $ 1 billion capital. Recent approval of loans for further projects worth $400 million during 1980 means its funds will be practically exhausted by 1981. Discussion in January on the replenishment of its resources made little progress and as the issue was put back for consideration until late this year it seems only too likely that replenishment for operations in 1981-1983 will be seriously delayed. This would be a major set-back since the achievements of IFAD to date have been significant.

74. The World Bank and the International Development Association (IDA) have been increasing their loans and credits for food production in recent years. However, the gap between estimated needs to meet modest growth targets in agriculture and food production and external capital flows remains wide, especially for the poorest countries which have been adversely affected by the stagnation in ODA on which they have a great dependence.

IV. The Rising Food Imports of Developing Countries

75. The Brandt Commission's Report reinforces the almost unanimous agreement among the various agencies and authorities that the food requirements of developing countries will rise sharply in the next decade; it is only in their estimates of requirements for 1990 that there is disagreement. FAO, for example, forecasts the total cereal requirements of 83 cereal net-importing developing countries in 1990 at 77 million tonnes. The International Food Policy Research Institute (IFPRI) puts the shortfall in food supplies in developing market economies in 1990 at between 120-145 million tonnes; the low-income countries, accounting for almost two-thirds of the population of developing market economies, would have a projected food gap of 70-85 million tonnes. Alternative IFPRI scenarios, postulating higher rates of growth in food output than in 1960-1975, still indicate the likelihood of a food deficit of 78-97 million tonnes. The foreign exchange costs of importing even half the projected deficit would be enormous, while the traditional wheat exporting nations might be hard put to meet the enhanced demand, except at inflated prices.

76. The likely food deficits of developing countries by 1990 must be faced. It is only a decade until 1990. The cereal imports of the developing countries have risen sharply in the post-war period, growing between 1972 and 1978 from 44 million tonnes to nearly 79 million tonnes. Developing country requirements for imports are likely to rise further, even if their agricultural productivity also improves. Increases in the purchasing power of the poor and/or some re-distribution of income may be expected to intensify developing countries' demand for food; this may stimulate domestic production, but is also likely to raise the demand for imported food.

V. Water Resources

77. An increase in the water resources at the disposal of developing countries is an essential pre-requisite for increasing their food production. Drainage and irrigation are the two key elements in the development of water resources, but many projects in this sphere are large-scale developments with long gestation periods.

78. The development of water resources should be viewed as the priority area for agricultural development since without adequate water supplies improvements in other areas of agricultural practice will be ineffectual. The cultivation of new high-yielding varieties (HYVs) of rice and wheat is critically dependent upon the availability of water and fertilisers. HYVs cannot be introduced in the absence of adequate water resources, and it is no coincidence that the greatest achievements with HYVs have taken place in Asia, with the largest proportion of the world's irrigated land area.

79. In the short-term the major requirements envisaged for water resources are improvements in and renovations of existing irrigation systems, many of which have been allowed to slip into neglect. The improvement of these facilities will cost considerably less and can be undertaken in a much shorter period of time than can new works. Renovation usually requires relatively small capital expenditures but offers an opportunity to make intensive use of the labour available in developing countries. To conserve energy the use of gravity fed rather than pumped systems should be encouraged. New tube wells often afford relatively low-cost opportunities for additional water resources. Land drainage also figures in water resource control, and

offers scope both for the improvement of existing facilities and for the execution of small-scale, labour-intensive schemes. Lastly, water resource control requires the development of suitable institutions and the training of personnel. The greatest scope for improving water resources is in Asia; the development potential of the Near East is considerable but may require more capital-intensive projects.

80. In Africa and South America the development of water resources lies more with improved methods of rainfed agriculture than with irrigation schemes; this means the extension of cultivation to land already rainfed but for varieties of reasons not being exploited. Africa appears to offer the greatest potential for improving rainfed agriculture.

VI. Agricultural Research

81. Agricultural research has an important role in agricultural development. The "Green Revolution" has increased food production in a number of developing countries, especially in Asia. Research by the eleven international research institutes supported by the Consultative Group on International Agricultural Research (CGIAR) is funded by the international community, the CGIAR making $86 million available to the various institutions in 1978. The international research institutes have considerable achievements to their credit, notably semi-dwarf rice and high-yielding dwarf wheat, and currently thought is being given to ways to promote the transformation or adaptation of the results of their research in national research centres. A major part of research on developing countries' needs must be carried out at the national or regional levels, since agriculture is largely location-specific and in general plant varieties cannot be transferred from one climatic region to another. Therefore, support is required for regional and national research centres. Recently the CGIAR has created the International Service for National Agricultural Research (ISNAR) to strengthen the capacity of national agricultural research institutes.

82. Aside from the practical application of the results of research much more needs to be done in the way of improving seed varieties. The success with HYVs for rice and wheat in Asia shows what can be done, but many developing countries elsewhere in the world need to evolve new varieties of seed, a task that essentially needs to be undertaken at the national or regional rather than the international level. In many countries this may require more substantial finance and new policy frameworks.

VII. Fertiliser Use

83. Fertiliser consumption needs to be raised very substantially in developing countries, so as to achieve the optimum results from the new seed varieties being evolved and the water resources being developed. It is likely that the application of additional supplies of fertiliser in developing countries, which have low fertiliser consumption, leads to much greater increments in food output than the application of similar amounts in developed countries. Fertiliser consumption is growing more rapidly in developing than in developed countries. The need to increase fertiliser production in developing countries has been recognised by the World Bank, which has been giving increased investment support for fertiliser plant construction in developing countries. About one-tenth of developing country fertiliser

requirements in 1977-1978 were met by bilateral or multilateral assistance. Nevertheless, many developing countries are unable to meet their fertiliser requirements owing to balance-of-payments difficulties.

84. The International Fertiliser Supply Scheme (IFS), established in 1974 to assist developing countries overcome fertiliser supply shortages, has in recent years been supplying a diminishing proportion of total fertiliser aid - only 6 per cent in 1977-1978 as against a peak of 18 per cent in 1975-1976. Although the IFS has been re-oriented with a technical assistance component, there remains an urgent need for greater resources to be channelled through it to assure fertiliser supplies to the poorest countries.

VIII. Post Harvest Losses

85. The importance of reducing these is widely recognised, and FAO has established a special Fund for the prevention of food losses. Contributors have been slow in supporting the Fund, and more assistance is needed. The importance of reducing pre- and post-harvest losses is often overlooked in international discussion; since post-harvest losses in the case of cereals may be 20-40 per cent of total output, it can be argued that greater priority should be given to this aspect of increasing food supplies in developing countries rather than placing so much emphasis on raising output. Indeed a given expenditure on reducing post-harvest losses may result in a greater net addition to food supplies than that generated by a similar sum spent on increasing food output, since a high proportion of the increased output may well be lost at the post-harvest stage.

IX. Agrarian Reform

86. The need for land reform is widely recognised in international discussions but progress in implementation depends on domestic policies. Thus it was that the World Conference on Agrarian Reform and Rural Development held in July 1979 had to content itself with endorsing some fundamental principles and agreeing on a form of monitoring by FAO, and some possible follow-up action.

87. Experience suggests that if land reform is undertaken, and is competently and equitably enforced, it could have highly beneficial implications for food and agriculture. To the extent that land reform gives to each family a small area which it owns, the less likely that family would starve in a food crisis. Land reform encourages more intensive use of land both in terms of productivity and cropping patterns, and such intensive use is particularly necessary where labour is abundant relative to land. Widespread unemployment makes the need for land reform urgent; in the absence of land reform, both labour and land are often under-utilised. Provided that adequate credit, technical and social services are also available, land reform could be an important means of encouraging agricultural development, and a better distribution of agricultural incomes and the available supply of food. It also helps to check the drift of the rural population to the urban centres, where so often their plight is little better or even worse than in the rural areas they have come from.

X. Energy Costs

88. The implications for food and agriculture of the recent and prospective rises in energy prices are difficult to quantify. In developing countries it seems that the costs of direct inputs of energy (e.g. oil for tractors, electricity for crop drying and the energy inputs of fertilisers) may be of relatively less importance than those of indirect energy inputs (e.g. the energy components in machinery, buildings and feed processing). In developed countries the effects of rises in oil prices may have proportionately greater direct effects on agricultural costs but their effects on the economies of the countries concerned will be far less serious. For both types of country, however, the overall effects on food and agriculture of continuing increases in the real price of oil are sufficiently serious to require a much more intensive programme of research and development into new methods of producing energy-intensive inputs (e.g. nitrogenous fertiliser) and new forms of renewable energy, such as alcohol from maize or sugar, from the agricultural sector. The effect of oil price rises on fertilisers may not be as serious as would appear at first sight, if only because nitrogen may be capable of being obtained from energy sources other than oil or gas.

XI. Principal Issues

89. The food sector in developing countries has an important role to play in economic development and particularly in relieving absolute poverty. It therefore deserves priority attention. Two aspects need serious consideration - international measures to establish a dependable system of world food security and accelerated food production in the developing countries.

90. In the first it is extremely important that agreement is reached early on an International Grains Arrangement with price stability achieved through internationally coordinated national stocking policies. This would ensure not only stable prices but the availability of international reserves to meet production shortfalls.

91. A new target is needed for food aid which would take into account the wide gap between food consumption and minimum nutritional requirements. Bilateral food aid is open to the possibility of political factors rather than needs being used as criteria for distribution. Consideration should therefore be given to more food aid being provided through multilateral schemes such as the World Food Programme.

92. Serious consideration should be given to the establishment at the IMF or in another appropriate institution of a food financing facility to enable poorer countries to maintain consumption during periods of local harvest failures or international shortages.

93. On the longer-term problem of accelerating food production in developing countries, serious attention should be given to ensuring increased external capital flows. Here ODA levels are important since many Food Priority Countries are the poorer developing countries which have substantial dependence on concessional capital inflows. Consideration might also be given to the improvement of market access for agricultural exports from developing countries and priorities in domestic agricultural policy such as the role of increased investment in agriculture, land reform, agriculture research, irrigation and harvest and post-harvest losses.

Table 1 - Index numbers of world and regional food and agricultural production[a]

	1972	1973	1974	1975	1976	1977	1978	1979[b]	Annual rate of change[c] 1961-70	1970-78[b]
	(1969-71 = 100)								(per cent)	
Food production										
Developing market economies[d]	102	106	108	115	117	121	126	126	3.0	2.9
Africa	103	100	107	107	111	108	112	114	2.0	1.5
Far East	99	107	105	115	115	122	126	124	2.7	3.0
Latin America	103	106	112	116	122	126	135	135	3.5	3.4
Near East	110	105	114	121	128	125	131	131	3.2	3.6
Asian centrally planned economies	104	110	114	118	122	121	128	133	2.9	3.0
TOTAL DEVELOPING COUNTRIES	103	107	110	116	119	121	126	128	2.9	3.0
Developed market economies[d]	103	105	109	111	112	116	120	121	2.4	2.3
North America	104	105	106	114	118	122	124	128	2.3	3.0
Oceania	104	116	109	119	127	124	140	133	3.4	4.0
Western Europe	101	106	111	109	109	111	116	117	2.3	1.7
Eastern Europe and the USSR	103	116	113	112	115	118	126	124	3.1	2.4
TOTAL DEVELOPED COUNTRIES	103	109	110	112	113	117	122	122	2.6	2.3
WORLD	103	108	110	113	116	119	124	125	2.8	2.6
Agricultural production										
Developing market economies[d]	102	106	109	114	116	120	124	125	2.8	2.8
Africa	103	100	106	107	110	108	111	113	2.7	1.4
Far East	100	108	106	115	114	121	125	123	2.7	2.9
Latin America	103	106	113	115	118	124	128	133	2.9	3.1
Near East	110	104	114	119	125	123	128	128	3.3	3.3
Asian centrally planned economies	104	110	114	118	122	121	128	132	3.0	2.9
TOTAL DEVELOPING COUNTRIES	103	107	110	115	118	120	125	127	3.0	2.8
Developed market economies[d]	103	105	108	111	112	115	119	120	2.1	2.2
North America	104	105	106	113	117	122	123	127	1.7	2.9
Oceania	102	109	103	112	118	115	128	123	3.1	2.8
Western Europe	101	106	111	110	109	111	116	117	2.2	1.7
Eastern Europe and the USSR	103	115	113	112	115	118	125	124	3.1	2.4
TOTAL DEVELOPED COUNTRIES	103	109	110	111	113	116	121	121	2.4	2.3
WORLD	103	108	110	113	115	118	123	124	2.6	2.5

Source: FAO.

[a] Crops and livestock only. [b] Preliminary. [c] Exponential trend. [d] Including countries in other regions not specified.

Table 2 - Index numbers of food production per caput [a] in developing regions and MSA countries

	1972	1973	1974	1975	1976	1977	1978	1979 [b]	Annual rate of change [c] 1961-70	Annual rate of change [c] 1970-78 [b]
	(1969-71 = 100)								(Per cent)	
Developing market economies [d]	97	98	98	101	101	101	102	100	0.4	0.3
Africa	97	92	96	94	94	89	90	89	-	- 1.2
Far East	95	100	96	102	99	103	104	100	0.2	0.4
Latin America	97	98	101	102	104	105	106	106	0.7	0.7
Near East	104	97	103	106	109	104	105	102	0.5	0.8
Asian centrally planned economies	100	104	106	108	111	108	113	116	1.1	1.2
TOTAL DEVELOPING COUNTRIES	98	100	101	103	104	104	106	105	0.6	0.6
MSA in Africa	95	94	96	94	93	90	90 [b]	..	0.4	- 1.2
MSA in Far East	93	99	92	100	96	100	100 [b]	..	- 0.1	-
MSA in Latin America	102	102	98	96	99	100	107 [b]	..	1.0	0.3
MSA in Near East	100	101	101	102	101	95	95 [b]	..	- 0.2	- 0.3
TOTAL MSA COUNTRIES	94	98	94	99	96	98	98 [b]	..	0.1	- 0.2

Source: FAO.

[a] Crops and livestock only. [b] Preliminary. [c] Exponential trend. [d] Including countries in other regions not specified.

Table 3 - World cereal supplies

(million tonnes)

	1972/73	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79	1979/80[d]
ALL CEREALS[a]								
Production	1,181	1,266	1,223	1,243	1,353	1,353	1,464	1,408
Exports	134	138	131	148	149	164	168	184
Imports by developing countries	53	65	64	57	58	72	81	84
Ending stocks	165	180	175	180	236	229	268	262
Stocks as per cent of world consumption	13	15	14	14	14	16	19	18
WHEAT								
Production	347	377	359	356	418	391	449	417
Exports	68	63	63	66	61	72	72	78
Imports by developing countries	34	40	43	38	39	47	49	50
Ending stocks	67	78	73	73	110	93	117	106
RICE (MILLED)								
Production	198	222	222	240	233	247	255	250
Exports[b]	9	9	9	9	10	11	10	11
Imports by developing countries[b]	7	7	6	5	6	8	8	9
Ending stocks	24	29	30	37	37	40	44	42
COARSE GRAINS								
Production	636	667	642	647	702	715	760	741
Exports	57	66	59	73	79	81	87	94
Imports by developing countries	12	18	15	14	13	17	24	25
Ending stocks [c]	74	73	72	70	89	96	107	114

Source: FAO.

a Wheat, rice (milled equivalent) and coarse grains.

b Calendar years, first of season shown.

c Approximate figures.

d Forecast.

Table 4 - Imports of grain into developing countries

	1972	1973	1974	1975	1976	1977	1978
	(thousand tonnes)						
Total developing countries	44,379	57,697	61,140	61,000	58,056	63,382	78,724
Of which:							
Total MSA countries	8,678	14,166	15,681	19,229	17,076	12,204	15,544
MSA countries in Africa	3,784	4,237	5,467	6,069	6,488	7,718	9,375
India	661	3,693	5,261	7,514	7,130	969	235
Other MSA countries in Asia	3,904	5,787	4,547	5,167	3,029	2,809	5,203
Other MSA countries	329	449	406	479	429	707	730
Total MSA excluding India	8,017	10,473	10,420	11,715	9,946	11,235	15,309
	($ millions)						
Total developing countries	3,809	7,386	12,921	12,220	10,730	10,820	13,868
Of which:							
Total MSA countries	762	1,777	3,183	3,754	3,108	1,997	2,422
MSA countries in Africa	310	533	1,284	1,212	1,112	1,237	1,592
India	83	502	834	1,303	1,358	208	60
Other MSA countries in Asia	342	687	984	1,141	553	444	654
Other MSA countries	27	55	81	97	84	109	116
Total MSA excluding India	679	1,275	2,348	2,451	1,749	1,789	2,362

Source: FAO Trade Year Books.

Table 5 - Food aid in cereals [a]

(thousand tonnes)

Donor	1972/73	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79	1979/80	1980/81
Argentina	2	10	20	-	22	34	30	23	35
Australia	259	222	340	268	230	257	312	325	400
Austria	-	-	-	-	-	-	-	20	20
Canada	887	486	594	1,034	1,176	884	735	550	600
EEC	986	1,208	1,413	928	1,131	1,451	1,352	1,287	1,650
Finland	25	17	24	25	33	47	9	14	20
Japan	528	350	182	33	46	141	352	680	300
Norway	-	-	-	10	10	10	10	30	30
Sweden	56	65	316	47	122	105	104	99	80
Switzerland	21	33	29	35	33	22	32	32	27
United States	7,025	3,198	4,712	4,284	6,147	5,896	6,188	5,436 [b]	5,732
Others [c]	320	62	753	199	137	495	620	500 [e]	500
Total	10,109	5,651	8,383	6,863	9,087	9,342 [d]	9,744 [d]	8,996	9,394

Source: FAO.

[a] For the period 1972/1973 to 1978/1979 figures relate to shipments during July/June. For 1979/1980 figures relate to allocations for the budgetary period of each country concerned, except when otherwise indicated. The figures for 1980/1981 are projected minimum commitments under the Food Aid Convention of 1980 on allocations.

[b] Cereal component of total planned food aid allocations of 5.7 million tonnes for the fiscal year 1979/1980 announced by the US Department of Agriculture.

[c] Includes occasional food aid from various donors on a calendar year basis.

[d] In addition, the USSR is reported to have provided 200,000 tons of wheat as emergency aid to Vietnam in 1977/1978 and 300,000 tones in 1978/1979.

[e] In addition, an estimated 300,000 tons is reportedly being given as emergency aid to Kampuchea by the USSR, Vietnam, other countries, and OXFAM.

Table 6 - Food and fuel imports

	Shares of value of merchandise imports						Energy imports as a percentage of merchandise export earnings	
	Food			Fuel				
	1960	1975	1976	1960	1975	1976	1960	1976
	(per cent)						(per cent)	
Low Income countries [a] of which:	17	21	..	7	10	..	9	19
Ethiopia	2	5	6	10	17	15	11	27
Bangladesh	..	51	42	..	8	13	..	29
Mali	20[c]	..	19	5[c]	..	4	13	25
Upper Volta	21[c]	21	..	4[c]	9	..	..	19
India	21	26	28	6	23	26	11	26
Pakistan	22[c]	24	21	10[c]	18	18	..	..
Sri Lanka	39	50	36	7	17	25	8	24
Tanzania	12	20	10	9	11	18	..	22
Kenya	12	6	7	11	28	27	18	54
Sudan	17	19	..	8	4	..	8	26
Middle Income countries [b] of which:	16	14	..	8	14	..	10	22
Liberia	16	14	..	4	15	..	3	12
Ghana	19	14	..	5	17	..	7	18
Thailand	10	4	5	11	23	23	12	28
Philippines	15	11	10	10	22	24	..	..
Papua New Guinea	30	..	23	5	..	14	..	..
Ivory Coast	18	15	14	6	14	13	5	10
Turkey	7	7	3	11	18	23	16	58
Jamaica	22	20	23	8	19	23	11	34
Brazil	14	6	8	19	26	32	21	43
Argentina	3	5	5	13	13	18	14	14

Source: World Bank, World Development Reports, 1978 and 1979.

[a] Countries with a per capita income of US $ 300 or less. [b] Countries with a per capita income of over US $ 300.
[c] The data refer to 1961.

DISARMAMENT AND DEVELOPMENT : THE MAIN ISSUES

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Disarmament and Development : the Main Issues

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I. Introduction

1. The link between disarmament and development is not just a pious hope that resources released by disarmament will be made available for development. Rather, it is to be found in the need to reverse the deeply rooted connection between armaments and poverty. Not only do armaments absorb resources but they also uphold a global power structure which is in itself an obstacle to the defeat of poverty. In a recent article, Lord Philip Noel-Baker wrote :

> "World armaments and world poverty are not disparate phenomena unconnected with each other; on the contrary, they are not only twin evils, causally connected; they can be more truly understood if they are thought of as one central and dominating phenomenon; the misuse of mankind's now vast annual flow of usable wealth."(1)

2. This paper is about the nature of this "central and dominating phenomenon" - the misuse of resources for military purposes. (It does not describe in any detail the present state of world armaments and progress towards disarmament, which are summarised, excellently, in other places(2).) Military spending, like other kinds of expenditure has a dual nature. On the one hand, it represents a collection of inputs - manpower (soldiers), capital (armaments), intermediate goods (food, fuel, ammunition), science and technology. Evidently, the way in which society allocates resources to military purposes will affect the level and direction of economic and social development. On the other hand, military spending also represents an output - war preparedness - and the use to which this output is put in defence of certain values and ways of doing things will also have consequences for development. In considering the connection between armaments and poverty, therefore, it is useful to look at both aspects of military spending - both the production and use of armaments.

II. Military Resources and Underdevelopment

3. Total world military spending amounts to approximately $450 billion a year; this is greater than world expenditure on health or education and amounts to more than a quarter of the entire income of the developing countries. Furthermore, military spending continues to grow, and developments in recent years - the new stage in the strategic arms race, accelerating expenditure on conventional armaments by the major powers, expanded proliferation of nuclear and conventional weapons - suggest that the growth of military spending may actually increase (see Table 1).

4. The very size of military spending indicates its importance both for the economies of advanced industrialised countries, where armaments are produced, and for developing countries, where armaments are for the most part imported and where, since the second world war, armaments have been largely used.

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1. Lord Philip Noel-Baker, "The Prospect for Disarmament", ADIU Report Vol. 1, No.4, December 1979.

2. See, e.g. papers by the Secretariat to the Brandt Commission.

(a) Advanced Industrialised Countries

5. In several advanced industrialised nations, the defence sector, with its research institutions, armament factories, military bases, etc., represents a significant part of the overall economy. Recent research in the United States and Western Europe has documented the way in which interests in institutional survival on the part of the domestic defence sector have constituted an important pressure for continued armament.(1) At the same time, this sector, of necessity, exercises a powerful influence on civilian economic and social activities.

6. Compared with other sectors, the defence sector is more science-intensive and more capital-intensive; that it is to say, expenditure on research and development (R & D) activities and on additions to fixed capital (i.e. weapons procurement and military construction) as a proportion of total expenditure is greater than for other kinds of expenditure.(2) For this reason, it seems likely that military spending will impact most strongly on the future of science and technology and on industrial investment.

(i) Armaments and Science and Technology

7. Statistics on military research and development are very hard to come by. It is widely stated that military-related R & D now engages about 25 per cent of all scientific manpower in the world and about 40 per cent of all R & D spending(3). Table 3 shows the main trends in R & D for the principal OECD countries. There is one school of thought which holds that this concentration of scientific resources yields civilian benefits in the form of 'spin-off'. There are undoubtedly important examples of 'spin-off', e.g. the transistor, but these benefits are offset by certain disadvantages which stem from the specifically military nature of the scientific effort.

8. First, military R & D represents a diversion of scientific and technical resources away from civilian R & D. Among Western countries, West Germany, the Netherlands and Switzerland all spend as much or more on civil R & D as a proportion of Gross National Product (GNP) than do the Unites States, the United Kingdom and France, who are the highest military R & D spenders (see Table 4). R & D spending which has an explicit civilian objective is, a priori, likely to achieve much more in the way of civilian benefits than R & D spending which has a primarily military objective.

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1. See, for example, G.T.Allison and F.A.Morris, "Armaments and Arms Control. Exploring the determinants of Military Weapons", Daedalus (summer 1975); J.R.Kurth, "Why we Buy the Weapons We Do", Foreign Policy No.11, 1973; M.Kaldor, European Defence Industries - National and International Implications, 1510 Monograph No.8, University of Sussex, 1972.
2. M.Kaldor and J.Perry Robinson, "War", in C.Freeman and M.Jahoda (editors), World Futures : The Great Debate, Martin Robertson, 1978.
3. R.L.Sivard, World Military and Social Expenditures, 1976, WMSE Publications, Virginia, 1976.

This argument was put forcefully by Robert Solo who argued that "those who were or might have been restless, probing industrialists, innovating entrepreneurs, or inventors tinkering in the shops became instead engineers on project teams, heads of research divisions, scientists in laboratories, or sub-contractors with the task of developing a component for a complex weapon system."(1)

9. Secondly, the pervasive influence of the military in all kinds of R & D spending has unduly oriented civilian development towards complex capital-intensive and hierarchical types of technology. For example, resources are devoted to the Concorde supersonic aircraft or nuclear energy instead of to cheaper forms of transport or energy-saving devices. In particular, Seymour Melman has argued that military ways of design and development have led to a tendency, at least in the West, for cost-maximising instead of cost-minimising.(2)

10. Thirdly, military technology has biased the industrial structure of the main arms producers. It can be argued that the currently dominant military technologies, far from being 'advanced', are the product of dominant but declining industrial sectors, e.g. engineering and shipbuilding in the United Kingdom, automobiles and aircraft in the United States, and represent over-extensions, so to speak, of particular technologies. Hence, they are characterised by rapidly diminishing marginal returns, i.e. very small improvements in utility for massive investment of effort. Consequently, military technologies extend the development of declining sectors and divert resources away from new dynamic sectors which are characterised by increasing returns. This is illustrated by the industrial pattern of R & D spending (see Table 5). A large share of American and British R & D spending goes into aerospace and is financed by government. In Germany and Japan, however, business enterprises finance the bulk of R & D spending and a high proportion of the total goes to dynamic sectors like chemicals. All four countries spend a significant amount on R & D in electronics. But in the United Kingdom and the United States, most of the R & D is financed by government for military purposes, whereas in Germany and Japan, it is financed by business enterprises for civilian purposes.(3)

(ii) Military Spending and Investment

11. After the second world war, it was widely argued that high military spending would play an important role in capitalist countries in maintaining the level of effective demand and thus mobilizing resources for investment and economic growth.(4) This turned out to be incorrect. On the contrary, there is a marked inverse correlation between investment as a share of GNP

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1. Robert A. Solo, "Gearing Military R & D to Economic Growth", Harvard Business Review, vol. XL, November-December 1962.

2. S. Melman, The Permanent War Economy. American Capitalism in Decline, Simon and Schuster, 1974.

3. M. Kaldor, "Arms and the Capitalist World Economy, Overdevelopment and Underdevelopment", in Carlton and Shaerf (editors) Arms Control and Technical Innovation, Croom Helm 1977; M. Kaldor, "Technical change in the British Defence Industry", in K. Pavitt (editor) Technical Change and Britain's Economic Performance, Macmillan, forthcoming.

4. See P.A. Baran and P.M. Sweezy, Monopoly Capital, Penguin, 1968; M. Kidron, Western Capitalism Since the War, Weidenfeld, 1968.

and military spending as a share of GNP. The United Kingdom and the United States are high military spenders and low investors while Japan is a low military spender and a high investor (see Table 6). Further, this inverse correlation has been shown to hold over time in the case of the United Kingdom.(1)

12. Thus, just as military R & D represents resources for civilian innovation foregone, so military spending as a whole represents resources for civilian investment foregone. There are several explanations for this. First, in capitalist countries consumption and welfare is a relatively stable proportion of total output, representing a socially determined 'social wage'; what is left over, the 'surplus', can be divided between military spending and investment. Secondly, the military industries are for the most part the capital-goods and export-intensive industries, i.e. machinery and transportation, and military spending can create short-term bottlenecks which can have serious long-term consequences for the economy.(2) It is widely considered that military priorities in the shipbuilding and engineering industries during the early 1950s lost the United Kingdom an important place in the world market. Finally, a slow-down in productivity, resulting from the concentration of military R & D resources, could reduce the incentive to slowing productivity growth, etc.

(iii) Military Spending and Development

13. In Western capitalist countries, therefore, military spending slows down productivity growth because it absorbs resources that might otherwise be used for civilian innovation and distorts the direction of civilian science and technology and industrial structure; and it slows down the rate of industrial development because it absorbs resources that might otherwise have been used for civilian investment and reduces the incentives to invest on account of the slow rate of civilian innovation. Hence, military spending is likely to slow down overall economic growth. Some, but not all, of these conclusions may apply to the centrally planned economies. While military spending does not appear to be directly competitive with investment in these countries, it may well slow down productivity growth. In particular, it is sometimes argued that because the military industries represent an important pressure group in the preparation of the plan (3) high military spending serves to freeze plan allocations and hence leads to industrial stagnation. Table 7 shows that the countries which enjoyed the highest rate of growth of Net Material Product (NMP) were those which devoted the lowest share of NMP to military spending.

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1. R. Smith, "Military Expenditure and Capitalism", Cambridge Journal of Economics, No. 1, 1977.

2. K.W. Rothschild, "Military Expenditure, Exports and Growth", Kyklos, 1973.

3. Vernon Aspaturion, "The Soviet Military Industrial Complex : Does It Exist?", in S.Rosen (editor), Testing the Theory of the Military Industrial Complex, Lexington Books, Massachusetts, 1973; John McDonnell, "The Soviet Defence Industry as a Pressure Group", in Michael MacGuire, Ken Booth, John McDonnell (editors), Soviet Naval Policy: Objectives and Constraints, Praeger, 1973.

14. Of course, economic growth is not synonymous with development. But there is no evidence to suggest that slower rates of growth are associated with a reordering of social priorities. On the contrary, as far as we know, military spending is inconsistent with many of the developmental aims of rich countries. First, the slow rate of economic growth and the tendency for capital-intensive types of technology may explain why the high military spenders have higher rates of unemployment than low military spenders,(1) while low productivity growth and the unproductive nature of military spending itself could explain the tendency for high rates of inflation. Secondly, because military spending absorbs a high share of central government expenditure, it may compete with welfare programmes. There is some evidence for this in the United States. Thirdly, military production tends to absorb more scarce resources, scarce metals and energy resources, like jet fuel or nuclear fuel, than other kinds of production and, as occurred on a catastrophic scale in Vietnam, military practice may often have harmful effects on the natural environment.(2)

(b) Developing Countries

15. The impact of military spending on poor countries is likely to be very different from its impact on rich countries. The indigenous science base and capital-goods base is extremely small, if not non-existent, in most developing countries. Therefore, weapons and equipment are, for the most part, imported. Even third world countries that are attempting to develop an indigenous armaments industry such as Egypt, Iran, Brazil or India, are heavily dependent on foreign technology, foreign capital-equipment, components and materials, and foreign specialists (see Table 13). Developing countries also import military advice and military training - in effect, a total military structure, generally based on the Western model.

16. Professor Benoit has argued that in developing countries, military spending as a share of GNP is positively correlated with economic growth.(3) He explains this correlation in a variety of ways; high military spending is said to attract foreign aid and investment, to lead to Keynesian-type stimulatory fiscal policies, and to encourage the creation of skills, attitudes and infrastructure etc., necessary for economic growth.

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1. In the United States, it is often argued that because expenditure per man is higher for military spending than other types of spending, military spending generates fewer jobs than other types of spending. In fact, the methodology of such comparisons is dubious, for unless there are profit differentials, and differential propensities to import, the entire spending should eventually trickle into the economy. Nevertheless, military spending will take longer to generate jobs and some may be lost through profit hoarding. (See Marion Anderson, The Empty Pork Barrel, Unemployment and the Pentagon Budget, A PIRGIM report, Michigan, April 1975.)

2. J.P. Robinson, The Effects of Weapons on Ecosystems, UNEP Technical Series, No. 1, Pergamon Press, 1979; SIPRI, Ecological Consequences of the Second Indo-China War, Almquist and Wicksell, Stockholm, 1976.

3. E. Benoit, Defence and Economic Growth in Developing Countries, Lexington, 1973.

17. Professor Benoit's statistics have always been open to question. His data cover 44 developing countries over two periods, 1950-1965 and 1960-1965. Over the longer period, his results could be spurious since high growth rates are equally explicable by high bilateral aid. The shorter period, 1960-1965, is really too short on which to base a conclusion of this kind. More recent evidence does not confirm Professor Benoit's finding.(1) There is a small group of countries for which high growth is associated with military spending. These are the oil-rich countries and a few US allies, like Brazil or South Korea. For the remainder, no significant correlation has been found, except for the war-torn economies, like Vietnam or Kampuchea, where high military spending is associated with negative rates of economic growth. In the case of India, one of Professor Benoit's case studies, military spending, as a share of GNP, has been negatively correlated with economic growth in recent years.(2)

18. While high military spending may not contribute to economic growth it does influence the strategy of economic development. First of all, there is some evidence that military spending encourages a dependent pattern of development in which third world countries are incorporated more tightly into a world economic system which primarily benefits advanced industrialised nations. In particular, through its influence on values, skills, infrastructur etc., it tends to foster an emphasis on the build-up of capital-intensive industry, and its associated infrastructure, which is heavily dependent on foreign technology.(3) This is tempered by constraints on foreign exchange. In most developing countries, military imports account for a high share of capital imports (see Table 12). And this is only the beginning of a chain of demands for imported technology - communications, repair and maintenance services, skilled personnel, etc. - associated with the import of modern weapons.(4)

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1. M. Kaldor, "The Military and Development", World Development, June 1976; M. Brzoska and H. Wulf, "Rejoinder to Benoit's 'Growth and Defence in developing Countries' - Misleading results and questionable Methods?", Economic Development and Cultural Change, forthcoming; Congressional Research Service, evidence provided to the House International Affairs Committee; Ron Smith, paper prepared for UN disarmament and development study, 1980, unpublished.

2. Brzoska and Wulf, op. cit.

3. P. Lock and H. Wulf: "The Economic Consequences of the Transfer of Military-oriented Technologies", in A. Eide and M. Kaldor (editors), The World Military Order. The Impact of Military Technology on the Third World, Macmillan, forthcoming.

4. Jo. Husbands, "The Long Long Pipeline: Arms Sales and Technological Dependence in the Third World", Centre for Defence Information, 1978.

19. Secondly, this type of development strategy tends to involve an unequal distribution of income as resources are transferred from countryside to town and from poor to rich in order to finance industrialisation. Military spending helps to preserve political and social structures, in which continued inegalitarianism is possible. Those very same countries, in which high rates of growth, based on the development of capital-intensive industry, are associated with high rates of military spending, are precisely those which tend to be the most inegalitarian. Hence, if we take the rate of infant mortality as a surrogate for the standard of living of the mass of the population, we find that countries like Turkey or Brazil have high rates of infant mortality in relation to absolute levels of income and environmental conditions (1) (see also Table 8).

20. Thirdly, because the industrial technology associated with imported arms is complex, capital-intensive and often the product of a stagnant industrial structure, militarily biased industrial growth does not provide the basis for self-sustaining economic growth through the export of manufactures. If one takes military expenditure per soldier as a rough surrogate for the capital-intensity of warfare and, hence, the reliance on advanced western weapon systems, then it is interesting to note that, among the newly industrialising countries, the two countries which are most successful in world markets, i.e. South Korea and Taiwan, have the least capital-intensive armed forces (see Table 8).

III. The Use of Force and Underdevelopment

21. Since the second world war, armaments have been used, for the most part, in the third world. The process of underdevelopment is not stable. On the contrary, it proceeds through crises of various kinds which may often erupt in violence. It was noted above that armaments help to preserve inequitable political and social structures. Development strategies of the kind described above benefit a small elite in third world countries and in advanced industrial countries. In the absence of popular legitimation, force may be used to preserve the political position of the elite in many different ways : through direct outside intervention by the foreign powers; through domestic repression; or through the military coup. In particular, the Westernized nature of military organisation tends to bias the attitudes and values of the soldier in favour of Western-type industrialisation. It is noteworthy that all those nations which are characterised by a combination of high economic growth and high military spending also have militaristic and authoritarian regimes. In addition, economic and social tensions of this kind may exacerbate national, ethnic or ideological rivalries that can also lead to war.

22. A number of studies have attempted to quantify the extent of violent conflict taking place since the end of the second world war.(2) Although estimates vary widely, all the studies show the preponderance of the third world as the focus for conflict. Blechman and Kaplan estimate that there have been 215 incidents in which the United States employed armed force for

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1. M. Kaldor and J. Perry Robinson, op. cit.

2. See Milton Leitenberg, "A Survey of Studies of Post World War II Wars, Conflicts and Military Coups", Symposium on Armament, Tension and War, Hanaholmen, Finland, September 26-28, 1977.

political purposes since 1946. Only 20 per cent of these incidents occurred in Europe.(1) Milton Leitenberg, in a survey of the years 1945-1975, counts 204 successful military coups, of which only 7 took place in Europe. During the same period, there were also 199 unsuccessful coups, of which 9 took place in Europe.(2) Finally, Istvan Kende has conducted an extensive survey of wars, i.e. armed conflicts en masse, from which he concludes that 116 wars have been fought since the end of the second world war and that the total duration of such wars was just under 350 years. Only 12 years have been spent on war in Europe, i.e. only 3 per cent of the total time spent on war between 1945 and 1974.(3)

23. The instability and violence which has characterised so many third world countries is, in itself, deeply inimicable to development. Kende estimates that the 116 wars resulted in 25 million casualties. And such figures inevitably obscure the economic and environmental dislocation which is characteristic of war, especially those where massive area-destruction weapons have been used, as in Vietnam. Thus, one can observe a vicious circle in which the acquisition of arms contributes to economic and social conflict which may erupt in armed violence which may further exacerbate the underlying crisis.

24. Although force has rarely been used in advanced industrial nations, armaments are the cement which hold together the two great military alliances, fomenting ideological hostility and preventing freer economic and social exchanges between the blocs. They also help to preserve the economic and political hegemony of the two super-powers which may also inhibit development in the fullest sense of the term.

25. The output of armaments is not necessarily commensurate with the input. That is to say, the utility of armaments does not seem to bear any definite relation to the resources used to make armaments. On the contrary, there are reasons to suppose that accumulation of armaments, measured in terms of the resources represented by them, i.e. values, far exceeds actual military need. In recent wars, e.g. Vietnam or the Arab-Israel conflict, the sides which possessed superior armaments did not win. Indeed, one might go further, as some have done, and assert that, in the modern era, security is inversely related to the level of military spending.

26. First of all, the accumulation of nuclear weapons exceeds the quantity required by the United States and the Soviet Union for mutual extermination, which, a priori, is all that should be required for effective deterrence. Any superfluous additions can only increase the risk of war through accident, miscalculation, or misperception. The final document of the 1978 Special Session of the United Nations on Disarmament concluded "the accumulation of weapons, particularly nuclear weapons, constitutes much more a threat than a protection of the future of mankind."

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1. Barry M. Blechman and Stephen S. Kaplan, Force Without War: US Armed Forces as a Political Instrument, Brookings Institution, Washington D.C., 1978.

2. Leitenberg, op. cit.

3. I. Kende, "116 Wars in 30 Years", in D. Carlton and C. Shaerf, op. cit.

27. Secondly, both nuclear and conventional weapons have become over-elaborate and much too costly. In advanced industrialised nations, the acquisition of arms is determined by subjective perceptions about the strategic environment which tend to be shaped by domestic military institutions. In peacetime, there is a tendency for those perceptions to become ever more remote from actual military contingencies. We have already seen how military technology is subject to diminishing marginal returns; some writers even suggest that marginal returns are negative and that older cheaper weapons are actually more effective. In particular, the trend towards complexity has been criticised on the grounds that, in battlefield conditions, operational simplicity, reliability, and minimal logistical requirements are of critical importance.(1)

28. Further, nearly all armaments are primarily designed for use in an industrial environment. Third world countries lack the basic industrial infrastructure, e.g. roads, airfields, telecommunications, to use the armaments effectively. Likewise the people from whom soldiers are recruited lack many of the basic industrial skills and know-how, like reading and writing, basic mathematics, driving, etc. Studies of wars in the third world, particularly the Indo-Pakistan wars, have shown that sophisticated modern weapons have actually proved a handicap.(2)

IV. Disarmament and Development

(a) Disarmament as a necessary condition for Development

29. The International Labour Office (ILO) has estimated that in 1972 there were some 1,200 million people in developing countries living in poverty, of whom some 700 million were so poor as to be 'destitute'. It suggested that a continuation of development on the pattern of the 1950s and 1960s would still leave hundreds of millions of people in poverty at the end of the century.(3) Most development experts now agree that development strategies should be reoriented towards the fulfilment of 'basic needs'. These have been defined to include basic consumption needs, e.g. food, clothing and housing; basic essential services, e.g. clean water, sanitation, basic education, health and transport facilities; productive employment; and participation in political and economic decision-making.(4) Such a strategy would involve economic growth combined with re-distribution of income and a greater degree of 'self-reliance'.

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1. See, for example, Johan J. Holst, Uwe Nerlich (editors), Beyond Nuclear Deterrence. New Aims New Arms, Crane, Russak & Company Inc., New York, 1977.
2. J.Ansari and M. Kaldor, "Imported Military Technology and Conflict Dynamics, the Bangladesh Crisis of 1971", in M. Kaldor and A. Eide, op. cit.
3. ILO, Meeting Basic Needs Strategies for Eradicating Mass Poverty and Unemployment, Geneva, 1977.
4. R. Jolly, "Objectives and Means for Linking Disarmament to Development", in R. Jolly (editor), Disarmament and World Development, Pergamon, 1978.

30. This strategy is incompatible with the current level and nature of armaments.

- First, armaments absorb resources that would be needed for development. Between 1960 and 1976, almost twenty times as much money went into military expansion as into aid for development. The average contribution of all donor nations for which records are available amounted to 0.3 per cent of their combined GNP, while their military expenditures took 6.2 per cent of GNP during those same years.(1)

- Secondly, armaments play an important role in fostering relations of dependence. Hence, the continued use and transfer of arms would reduce the possibility for self-reliance among third world countries.

- Thirdly, the current level of armaments is incompatible with world economic growth because it slows down the rate of economic growth in rich countries, from where the additional resources needed for an alternative development strategy would otherwise be generated.

- Fourthly, and perhaps most importantly, current armaments policy is incompatible with re-distribution because it serves to uphold inequitable domestic and international political and economic structures, generally associated with capital-intensive industrialisation strategies that actually prevent the fulfilment of 'basic needs'.

(b) Development as a necessary condition for Disarmament

31. Despite the lessening of East-West tension, international efforts to limit the growth of armaments have foundered. Since the beginning of detente, there have been a number of limited arms control agreements, such as the Partial Test Ban Treaty, SALT I, the Outer Space Treaty, the Seabed Treaty, etc., but none of these has actually succeeded in reducing the level of armaments. While such agreements have undoubtedly increased understanding between the two super-powers and may have helped to control some of the more destabilizing elements of the arms race, they have also focused attention on minute changes in the overall military balance and have, in a sense, legitimised weapons development in areas not covered by agreement. Continued military competition, despite detente and despite arms control, may well be a major cause of the present deterioration in US/USSR relations and the collapse of arms control, limited as it has been.

32. Development could help to weaken this military competition. First of all, the significance of domestic interests in the continued production and export of armaments in advanced industrialised countries has not received sufficient recognition. If an alternative outlet in the form of demands for

1. R.L. Sivard, World Military and Social Expenditure 1978, WMSE Publications, Virginia, 1978.

socially useful production could be found for current capacity to design, develop and produce arms, and if resources could be transferred from the defence sector to more dynamic growth-stimulating civilian sectors, this would greatly reduce domestic pressures for continued armament. Secondly, a successful development strategy would reduce the crisis and conflicts in the third world which contribute to war, military intervention, repression and militarism, and this would also reduce the need for armaments.

(c) New Approaches to Disarmament

33. Both disarmament and development can be viewed, not as once-for-all acts of will, but as long-term processes which, once set in motion, will feed upon each other. Once recognised, the link between disarmament and development can contribute to both. In addition to continued efforts to achieve international agreements on disarmament, some new approaches might be pursued.

i) National or Regional Approaches

34. The limited success of bilateral and multilateral arms control agreements has led to proposals for regional approaches to disarmament. The Treaty of Thateloco, in which Latin American countries agreed to keep nuclear weapons out of the area, has often been held up as a model and forerunner for regional agreements. Recently, the idea of a European nuclear weapon-free zone has been put forward.(1)

35. In several advanced industrialised countries unilateral measures to limit excessive expenditure on armaments have been proposed, based on the argument that current levels of armament are out of proportion with military needs.(2) Similar ideas could be applied to third world countries. In particular, it has been suggested that third world countries might pursue 'self-reliant' armament strategies which would reduce the overall expenditure on armaments and re-direct armament policy so as to suit third world capabilities and security needs more appropriately. Third world countries could never compete against advanced industrial nations. But they could arm just enough to make invasion or occupation costly or difficult. Such a strategy could be linked with a reorientation of development strategy towards socially useful production and greater self-reliance.

36. It should be stressed that any specific proposal would need to be based on a concrete analysis of a particular nation or region. While it is possible to generalise about the overall dimensions of the problem, the room for manoeuvre in any given situation can vary widely.

ii) Conversion

37. The idea that new approaches to disarmament must be accomplished by new industrial strategies in rich countries has recently received much attention. In particular the conversion of military installations to peaceful uses is no longer conceived merely as a problem that follows from disarmament

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1. E.P.Thompson, "Campaign for a Bombfree Europe Starts Here", The Guardian, January 28, 1980.

2. See, for example, British Labour Party Defence Study Group, Sense About Defence, Quartet, 1977.

but instead as a positive contribution to disarmament. In the United Kingdom, pioneering work has been undertaken by trades unionists in the defence sector,[1] who propose investment in socially useful production as an alternative to armament and to increasing unemployment, which is partly the consequence of an arms oriented economy. They have suggested many exciting ideas, including new transport systems on road, rail or canal; energy-conserving equipment or alternative energy systems, based on renewable energy sources like waves, wind, tides, or direct solar collection; medical systems like sight for the blind using radar; as well as ideas for the process of production in agriculture, mining and manufacturing. Currently, trades unionists at Vickers and Lucas Aerospace are engaged in active compaigns to achieve investment in socially useful production. An international programme of conversion, linking excess armament capacity to the provision of 'basic needs', could represent a significant innovation in the field of disarmament.

iii) Education

38. The idea of the link between disarmament and development may be, as Lord Noel-Baker suggests, an idea whose time has come. It could provide a vehicle for the mobilisation of public opinion in favour of both goals. The UN study on disarmament and development, which is involving a wide range of scholars all over the world, is a useful beginning. Another suggestion is that a greater role should be accorded to the Non-Governmental Organisations (NGOs). There are literally hundreds of NGOs, including peace groups, church councils, trade unions, cooperative societies, etc. These should have the right to participate in international conferences, like the UN special session on disarmament, and should be given more resources with which to spread their message, whether it be about the arms race, human rights, illiteracy or disease. The NGOs could also help to offset the power of interests vested in continued armaments.

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1. See, for example, Vickers National Combine Committee of Shop-Stewards, Building a Chieftan Tank and the Alternative Use of Resources, 1978, and Lucas Aerospace Combine Shop-Stewards Committee, Corporate Plan - a Contemporary Strategy as a Positive Alternative to Recession and Redundancies, 1978.

TABLE 1

Growth of World Military Expenditure, 1958-1978

(US $m at constant 1973 prices and exchange rates)

	1958	1968	1978	Percentage growth		1977*
				1958/68	1968/78	
USA	69,622	103,077	71,475	48	-30	100,928
NATO	96,923	140,872	119,412	45	-15	169,448
USSR	30,500	58,000	71,000	90	22	70,000
WTO	33,280	63,396	79,816	90	26	80,669
Other Europe	3,225	4,560	6,212	41	36	9,269
Middle East	1,225	4,425	17,046	261	285	31,903
South Asia	1,100	2,176	3,414	98	57	4,290
Far East (excl. China)	3,100	6,086	10,850	96	78	15,908
China	(8,000)	(21,800)	(29,200)	173	34	(28,350)
Oceania	976	2,101	2,048	115	- 3	2,853
Africa (excl. Egypt)	275	1,828	5,461	565	199	8,444
Latin America	2,435	3,291	5,489	35	67	4,880
Third World	6,602	15,629	38,287	137	145	59,199
World total	150,539	250,535	278,948	66	11	357,114

* = At current prices and exchange rates.

( ) = estimate.

Third World = Middle East + South Asia + Far East (excl. China and Japan) + Africa (excl. Egypt) + Latin America.

Source: Stockholm International Peace Research Institute, World Armaments and Disarmaments, SIPRI Yearbook 1979, Taylor & Francis, London, 1979.

TABLE 2

World Military Expenditure, 1958-78: Breakdown by Regions

(percentages)

	1958	1963	1968	1973	1978
USA	46	39	41	30	26
NATO	64	57	56	47	43
USSR	20	27	23	25	25
WTO	22	25	25	28	29
Other Europe	2	2	2	2	2
Middle East	1	1	2	5	6
South Asia	1	1	1	1	1
Far East (excl. China)	2	2	2	3	4
China	5	7	9	10	10
Oceania	1	1	1	1	1
Africa (excl. Egypt)	Neg.	Neg.	1	1	2
Latin America	2	1	1	2	2
Third World	5	5	6	12	14
World total	100	100	100	100	100

Neg. = less than 0.5 per cent

Third World = Middle East + South Asia + Far East (excl. China and Japan) + Africa (excl. Egypt) + Latin America.

Source : Stockholm International Peace Research Institute, World Armaments and Disarmament, SIPRI Yearbook, 1979, Taylor & Francis, London, 1979.

TABLE 3

Trends in Government-financed Expenditure on R & D for Defence

(in 1/1000 of GDP)

	1961	1965	1970	1971	1972	1973	1974	1975	1976	1977
Canada	9.7	12.3	5.8	5.5	4.9	4.4	3.8	3.6	3.4	..
France	40.5	56.7	35.8	33.2	31.1	..	40.1	34.8	31.4	30.6
Germany	11.5	16.1	16.9	15.6	..	14.7	14.3	13.7	13.3	13.4
Italy	..	2.1	2.0	2.0	..	2.1	1.8	1.4	1.9	1.9
Japan	1.7	1.4	1.1[a]	..	..	..	..	1.1	..	..
Netherlands	..	..	..	..	4.3	3.8	3.2	3.4	3.2	3.0[b]
Sweden	35.8	40.9	22.5	..	..	..	..	..	..	..
Switzerland	..	..	5.9	7.0	7.0	5.2	5.0	4.7	5.4	..
United Kingdom	91.4	73.8	50.7	52.9	53.6	54.6	57.4	61.9	55.6	57.6[c]
United States	140.1	107.0	85.9	79.8	72.8	66.3	65.6	64.1	65.1	65.8

a 1969

b 1978 : 3.4.

c 1978 : 55.3.

Source: : OECD, Science and Technology in the New Socio-Economic Context, Paris, 1979.

TABLE 4

Total R&D Expenditure for Selected OECD Countries

Breakdown by Function

	R&D as percent of GDP		Space & Defence R&D as percent of total R&D		Space & Defence R&D as percent of GDP		Civil R&D as percent of GDP	
	1967	1975	1967	1975	1967	1975	1967	1975
France	2.2[a]	1.8	9.9	7.7	0.2	0.1	2.0[a]	1.7
Germany	1.7	2.1	1.0[c]	2.1	(neg.)	neg.	(1.7)	2.1
Japan	1.3	1.7	1.0	..	neg.	(neg.)[b]	1.3	(1.7)[b]
Netherlands	2.2	1.9	1.3[c]	0.9	(neg)	neg.	(2.2)	1.9
Sweden	1.3	1.8	1.5[d]	4.7	(neg.)	0.1	1.3	1.7
Switzerland	1.7	2.2	..	1.0	..	neg.	..	2.2
United Kingdom	2.3	2.1	9.4	11.8	0.2	0.2	2.1	1.9
United States	2.9	2.3	10.9[e]	..	0.3[e]	(0.4)	2.4[e]	(1.9)

a Includes social sciences.
b Estimated on basis of 1973.
c 1971.
d 1973.
e 1969.

( ) = estimate.
.. = not available.
neg. = less than 0.1 percent.

Source: OECD, Science and Technology in the New Socio-Economic Context Statistical Annex, Paris, 1979.

Table 5

Sectoral Distribution of R&D Expenditure in Manufacturing in Selected OECD Countries
(percentages)

		France			Germany			Japan			United Kingdom			United States		
		ind. fin.	gov. fin.	to-tal	ind. fin.	gov. fin.	to-tal	ind. fin.	gov. fin.	to-tal	ind. fin.	gov. fin.	to-tal	ind. fin.	gov. fin.	to-tal
Electrical/ Electronics	1967	22.7	25.6	24.6	25.2	29.8	25.9	24.4	33.0	24.5	22.3	27.9	24.1	20.0	28.8	24.4
	1975	27.0	35.7	31.7	30.0	31.0	29.9	26.0	32.3	26.1	20.5	34.5	26.0	20.9	30.4	21.8
Chemical	1967	27.4	3.7	19.0	33.2	4.3	28.5	27.1	11.0	27.0	21.0	1.1	14.7	21.0	2.8	14.8
	1975	26.1	2.9	19.2	35.0	2.3	29.1	22.4	2.9	22.1	29.5	1.9	19.7	21.4	3.2	14.6
Machinery	1967	7.7	2.4	5.6	12.2	37.1	16.2	10.7	22.0	10.8	14.4	7.4	11.8	17.3	6.4	11.8
	1975	7.0	1.4	5.2	13.0	20.7	13.9	9.9	7.4	9.8	11.3	1.9	7.9	21.8	6.7	18.7
Air & Space	1967	8.0	66.1	28.8	0.9	24.9	5.0	0.0	0.0	0	7.1	61.0	25.3	14.5	56.8	35.8
	1975	6.6	57.8	20.2	2.0	40.9	9.5	0.0	0.0	0	5.0	58.8	23.9	8.3	54.7	24.4
Other transport	1967	13.7	0.5	8.6	14.9	1.8	12.6	12.5	22.0	12.5	12.4	1.3	8.5	12.6	4.5	8.6
	1975	15.9	0.5	11.1	14.0	0.6	11.6	18.3	50.0	18.9	12.3	2.2	8.6	13.9	4.1	10.4
Basic metals	1967	6.1	1.3	4.4	9.8	0.8	8.4	10.6	6.0	10.6	7.1	0.7	5.0	4.9	0.3	2.6
	1975	5.4	0.7	4.1	3.0	2.1	3.1	9.5	4.4	9.4	5.9	0.2	3.8	4.5	0.3	3.2
Chemical-linked	1967	10.1	0.2	6.1	2.4	0.8	2.1	7.7	0.0	7.7	9.9	0.3	6.7	5.1	0.3	2.7
	1975	8.9	0.5	6.2	2.0	1.3	2.0	6.4	1.5	6.3	10.8	0.3	7.1	4.4	0.5	3.6
Other manufac-turing	1967	4.3	0.2	2.9	1.4	0.5	1.3	7.0	6.0	6.9	5.8	0.3	3.9	4.6	0.1	2.3
	1975	3.2	0.5	2.3	1.0	1.1	0.9	7.5	1.5	7.4	4.7	0.2	3.0	4.8	0.1	3.3
Total manufac-turing	1967	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	1975	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

ind. fin. = industry financed.

gov. fin. = government financed.

Source: OECD, Science and Technology in the New Socio-Economic Context, Paris, 1979.

TABLE 6

OECD Countries : Military Spending and Investment, 1977 and Economic Growth, 1960-77

	Military spending ($ million)	Military burden[a] (%)	Armed Forces (000)	Military spending divided by Armed Forces ($)	Investment[b] (%)	Per capita annual growth (%)
Australia	2,747	2.6	70	39,243	28	2.9
Austria	499	1.1	37	13,486	29	4.2
Belgium	2,285	3.2	86	26,870	22	4.0
Denmark	1,011	2.5	35	28,886	23	3.1
Finland	484	1.7	40	12,100	27	4.2
France	14,805	3.9	502	29,492	24	4.2
West Germany	16,306	3.4	489	33,346	22	3.3
Ireland	145	1.6	13	11,154	25	3.1
Italy	4,849	2.7	330	14,693	21	3.7
Japan	5,699	0.9	236	24,148	32	7.7
Netherlands	3,453	3.6	110	31,390	23	3.7
New Zealand	231	1.8	13	17,770	28	1.9
Norway	1,062	3.1	39	27,230	36	3.9
Sweden	2,498	3.3	69	36,201	20	2.9
Switzerland	1,350	2.1	19[c]	71,053[c]	21	2.1
United Kingdom	11,378	4.8	318	35,780	19	2.5
United States	100,928	5.4	2,100	48,061	18	2.4
Canada	4,134	2.0	80	51,675	23	3.6

a Military burden = Military spending as a percentage of Gross National Product.
b Investment = Gross domestic investment as a percentage of Gross Domestic Product.
c The Swiss permanent standing army is very small, because Switzerland has a citizen army. Hence, these figures are not comparable with those for other countries.

Source: US ACDA, World Military Expenditure and Arms Transfers, 1968-1977, Washington DC, 1979; World Bank, World Development Report 1979, Washington DC, 1979.

TABLE 7

Centrally Planned Economies: Military Spending and Investment, 1977 and Economic Growth, 1960-77

	Military spending ($ million)	Armed Forces (000)	Military spending divided by Armed Forces ($)	Military burden a (%)	Investment b (%)	Per capita annual growth c (%)
Bulgaria	648	177	3,661	2.8d	..d	7.0
Czechoslovakia	2,207	206	10,714	3.9	15	4.5
Germany DR	3,311	222	14,914	4.5	19	5.4
Hungary	631	144	4,381	2.4	20	5.7
Poland	2,900	430	6,744	2.9	28	7.8
Romania	972	220	4,418	..	..	9.8
USSR	70,000	4,700	14,894	8.0	(17)e	(4.8)f

a Military burden = Military spending as a percentage of Net Material Product.
b Net fixed capital formation as a percentage of net material product.
c Average annual rate of growth of Net Material Product per capita.
d In 1972 the military burden was 2.7% and investment was 16%.
e In 1976 investment was an estimated 18%.
f Growth for 1970-76.

( ) estimate

Sources: Stockholm International Peace Research Institute, World Armaments and Disarmament, SIPRI Yearbook 1979, Taylor & Francis, London 1979;

US ACDA, World Military Expenditures and Arms Transfers, 1968-77, Washington 1979;

United Nations, Statistical Yearbook 1978, New York, 1979.

TABLE 8

Newly Industrialising Countries: Military Expenditures and Selected Economic Indicators

	Mil. exp. (1976 $mn.)		Mil. exp. growth (%)	Armed forces (000)		Mil. exp. divided by Armed Forces ($)		H + E divided by Mil. exp.	GNP per cap. (1976 $)	GNP per cap. annual growth (%)	Mil. burden (%)	Inf. mort. (per 000)
	1968	1977	1968-77	1968	1977	1968	1977	1976	1977	1960-77	1977	1975
Brazil	1,278	1,536	20.2	340	450	37,658	3,413	(1.5)	1,259.9	4.9	1.0	82
Greece	648	1,079	66.5	185	290	3,502	3,721	0.7	2,558.6	6.2	4.6	24
Israel	976	2,781	184.9	95	165	10,274	16,855	0.3	2,708.4	4.8	28.4	22
S. Korea	443	1,633	268.6	620	600	715	2,722	0.9	724.5	7.4	5.9	47
Mexico	303	488	61.1	75	100	4,040	4,880	..a	1,055.0	2.8	0.7	61
Philippines	120	597	157.4	51	155	2,352	3,852	0.7	419.0	2.5	3.2	74
Portugal	762	582	-23.6	215	59	3,544	9,864	(0.9)	1,816.3	6.0	3.3	38
Singapore	77	401	420.8	11	36	7,000	11,139	0.7	2,704.9	7.5	6.4	14
Spain	2,326	2,826	21.4	370	309	6,286	9,146	(1.4)	2,925.4	5.2	2.7	14
Taiwan	930	1,517	63.1	528	460	1,761	3,298	0.1	1,101.7	6.2	8.2	26
Turkey	1,103	2,537	130.0	535	540	2,061	4,698	0.9	1,069.0	4.1	5.7	119
Yugoslavia	1,013	1,827	80.4	257	270	3,942	6,767	2.2	1,796.9	5.6	4.7	40
NICs	9,979	17,804	78.4	3,282	3,164	3,041	5,627					
OPEC	6,800	23,400	244.1	969	1,340	7,018	17,463	0.7	984.0		7.7	
Developing	53,700	91,900	71.1	12,500	15,600	4,296	5,891	0.6	490.0		5.9	104
Developed	304,500	319,400	4.9	11,900	10,600	25,589	30,132	1.6	5,380.0	3.4	5.6	20
OECD	191,900	172,100	-10.3	7,740	5,810	24,793	29,621	2.4	5,960.0		3.8	
World	358,100	411,300	14.8	24,300	26,300	14,737	15,639	1.4	1,710.0		5.7	93

a Amounted to 4.5 in 1972
( ) = Estimate
.. = not available
- = nil

Mil. exp. = Military expenditure.
H + E = Health + education expenditure.
Mil. burden = Military spending as a percentage of GNP.
Inf. mort. = Infant mortality (age 0-1).

Sources: US ACDA, World Military Expenditure and Arms Transfers, 1968-1977, Washington DC, 1979;
World Bank, World Development Report 1979, Washington DC, August 1979;
R.L. Sivard, World Military and Social Expenditure, 1978.

TABLE 9

Growth of Arms Imports, 1968-77

	Arms imports ($ million)		Arms imports (% of world total)		Arms imports: growth (%)
	1968	1977	1968	1977	1968-77
Africa	135	2,915	3	17	2,059
East Asia	2,070	1,120	39	6	-46
Latin America	250	972	5	6	289
Middle East	635	6,940	12	39	993
South Asia	280	740	5	4	164
Developing countries	3,640	13,680	68	78	276
OPEC	405	6,405	8	36	1,481
World	5,370	17,600	100	100	228

Source: US ACDA, World Military Expenditure and Arms Transfers, 1968-1977.

TABLE 10

Growth of Arms Exports, 1968-77

	Arms exports ($ million)		Arms exports (% of world total)		Arms exports: growth (%)
	1968	1977	1968	1977	1968-77
USA	2,700	6,900	51	39	156
USSR[a]	1,600	5,200	30	30	225
France [b]	850	1,300	16	7	53
UK[b]	600	825	11	5	38
FRG	100	800	12	5	70
WTO	1,860	6,150	35	35	231
NATO	3,315	10,435	62	59	215
Developing countries	190	650	4	4	242
WORLD	5,370	17,600	100	100	228

a See note b to Table 11.

b See note c to Table 11.

Source: US ACDA, World Military Expenditure and Arms Transfers, 1968-1977.

TABLE 11

Arms Trade, Total Exports and Military Production, 1977

	Arms imports ($ million)	Arms exports ($ million)	Arms exports divided by total exports (%)	Arms exports divided by military production a (%)
Belgium	60	120	0	12
Canada	170	70	0	5
China b	90	90	1	1
Czechoslovakia	250	470	4	27
France c	50	1,300	2	18
GDR b	470	90	1	6
FRG	480	800	1	12
Hungary b	160	40	1	7
Italy	150	320	1	16
Japan	130	20	0	1
Netherlands	150	40	0	3
Poland b	330	310	2	11
Soviet Union b	550	5,200	12	9
Sweden	40	50	0	5
Switzerland	70	190	1	29
UK c	150	825	1	16
USA	120	6,900	6	15

a Military production is estimated as total equipment costs in the military budget minus imports plus exports. Total equipment costs are assumed to amount to 40 per cent of military expenditure. This is based on the UK experience. In fact this figure probably varies enormously. It is too high for socialist countries, especially China which is an under-developed country with a labour-intensive army. It is probably too low for the United States where operation and maintenance, procurement and R, D T & E represented 66% of the budget in the US financial year ending June 1978. (See Appendix A, Table 1, Fiscal Year 1980 Defense Posture Statement Hearings, Subcommittee of the Committee on Appropriations, House of Representatives, US Congress, Washington 1979).

b These are CIA figures which value arms exports and arms production by socialist countries at Western acquisition costs. This overestimates both resources cost and military value of the arms. Hence the figure for the share of arms exports in total exports is probably too high.

c US ACDA persistently under-estimates arms exports for Britain and France. The official figures for arms exports during 1977 were $1,600m for UK and $3,124m for France. The UK figure is published annually in the Statement on Defence estimates; the French figure is usually published in the Assemblee Nationale report on the budget.

Source: US ACDA, World Military Expenditures and Arms Transfers, 1968-1977.

TABLE 12

Arms Imports and the Balance of Payments for Selected Third World Countries

	Arms Imports (US$million)	Arms Imports as percent of total imports	Imports of machinery and transport equipment as percent of total imports	Current Account balance ($ million)
	1977	1977	1976	1977[c]
Algeria	280	4	47	-1,935
Argentina	40	1	12	1,594
Bangladesh	20	2	14	-265
Bolivia	5	1	..	-120
Brazil	120	1	36	-3,787
Burma	0	0	..	-93
Burundi	5	7	28	9
Cameroon	10	1	37	-40
Chile	60	3	..	-290
Taiwan	180	2	31	1,162
Colombia	10	1	42	562
Congo	20	10	35	-182
Ecuador	150	10	46	-322
Egypt	200	4	30	-529
Ethiopia	430 (50)[a]	122 (14)[a d]	34	-70
Ghana	10 (20)[a]	.. (2)[a]	.. (26)[b]	-26
Greece	470	7	41	-1,108
Guatemala	5 (20)[a]	.. (2)[a]	.. (26)[b]	-50
India	460	8	19	1,874
Indonesia	60	1	41	423
Iran	2,400	17	45	5,371
Iraq	1,100	27	47	1,209
Israel	1,100	19	22	-250
Ivory Coast	10	1	33	-295
Jordan	130	9	30	30
Kenya	10	1	29	88
South Korea	280	3	27	447
Kuwait	310	7	..	5,483
Libya	950	18	35	2,905
Malaysia	60	1	33	675
Mali	30 (10)[a]	15 (5)[a]	30	5
Mexico	10	0	50	-547
Morocco	200	6	35	-1,743
Nicaragua	10	1	26	-122
Pakistan	200	8	26	-578
Peru	430 (200)[a]	23 (10)[a]	.. (37)[b]	-670
Philippines	60	1	30	-724
Portugal	5	0	25	14,021
Saudi Arabia	925	5	44	12,791
Singapore	30	0	26	-414
Somalia	80	50	.. (18)[b]	-31
South Africa	130	2	.. (37)[b]	538
Spain	290	2	21	-2,055
Sudan	20	2	.. (14)[b]	-443
Syria	575	21	34	-137
Tanzania	70	10	35	3
Thailand	50	1	30	-1,039
Tunisia	50	3	35	-476
Turkey	140	2	38	-3,155
Uganda	5 (20)[a]	2 (12)[a]	44	71
Uruguay	10	1	27	-40
Venezuela	90	1	.. (36)[b]	-1,828
Yugoslavia	110	1	34	-1,432
Zaire	50	8	..	-486
Zambia	10	1	..	-157
Developing	13,680	5.2		
OPEC	6,405	7.3		
Developed	3,925	0.6		
World	17,600	1.6		

a Figure for 1976. In some cases, e.g. Ethiopia, Mali and Peru, a large purchase results in an unusually high figure for 1977. b Figure for 1960. c Before interest payments on external debt. d The figure for arms imports is higher than the figure for merchandise imports, implying either an error or that the latter excludes arms.

Source: US ACDA, World Military Expenditures and Arms Transfers, 1968-1977; World Bank, World Development Report, 1979.

TABLE 13

Defence Production in Third World Countries

	1 Fighter Aircrafts, Jet Trainers, Aeroengines	2 Light Aircrafts	3 Helicopters	4 Missiles, Rockets	5 Large Fighting Ships	6 Medium Fighting Ships (up to 500 ts)	7 Small Fighting Ships and others (below 100 ts.)	8 Submarines	9 Tanks and APC	10 Small weapons, ammunition, guns etc.	11 Electronic and Avionic
Europe											
Greece	l								l^2	l	l^1
Spain	l	l			l	l	n	l	l	i l	n
Portugal		l_1			n	l	l			l	
Turkey	l^1	l^1		l	l	l	n	l	l^1	l	
Yugoslavia	i l	i l	l	l		l	n	n	n	i	
Latin America											
Argentina	i l	l	l	l	l	l		l	i l	i l	
Brazil	i l	i l		i l	l	i l	i	n	i l	i l	n l
Chile						n					
Colombia		l				n	l				
Dominican Rep.						n				i l	
Mexico	l^1	l			n	l				l	
Peru	l^1				l	i				l^1	
Venezuela	l^1						l			n	
Africa											
Algeria										n	
Congo										n	
Gabon						n	n				
Ghana										l	
Guinea										l	
Ivory Coast							n				
Malagasy Rep.						l					
Nigeria	l^1									l	
South Africa	l	l	l	l	l	n	n		l	l	n^1
Sudan										l	
Zaire										?	
Morocco										l	
Near/Middle East											
Egypt	l_2	l	l_1	l_1		n			l	l	
Iran	l^2		l^1	l^1	l^1					l	l
Israel	i l^1	i		i l		l	i l	i	i l	i	i l
Saudi Arabia										l	
Yemen (PDR)							?				
Asia											
Bangladesh							n				
Burma						n	l			l	
Hong Kong						n	n				
India	i l	i l	l	l	l	l	i	l	l	i l	i l
Indonesia	l_1	l	l			n				l	
Korea (North)	l^1				n	n	n			l	
Korea (South)	l^1		l^1			n	n			n	l
Malaysia						l				l	
Nepal										n	
Pakistan	l^1	l^1	l_1	l			n			l	l
Philippines		l	l^1	n			l			l	
Singapore						l	l			l	n
Sri Lanka							l				
Taiwan	l	l	l	n	n	l^2	n			l	n
Thailand						n	l			l	
Vietnam		l								n	

i = indigenous design. l = license production and technical assistance.
n = not known whether i or l. 1 = planned; 2 = only refitting, repair, etc.

Source: Peter Lock and Herbert Wulf, Register of Arms Production in Developing Countries, Study Group on Armaments and Underdevelopment, Hamburg, 1979.

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