OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.

DISCLAIMER

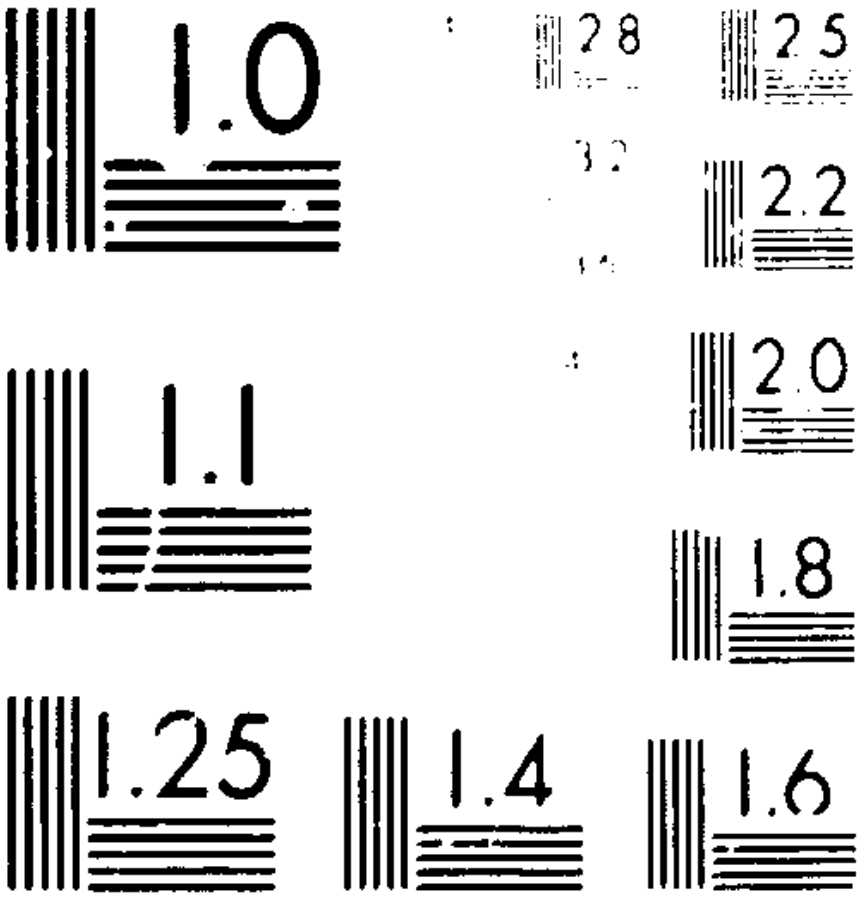
FAIR USE POLICY

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org


1.0
2.8
2.5
3.2
2.2
2.0
1.1
1.8
1.25
1.4
1.6

11038

Distr.
LIMITED
UNIDO/IS.279
13 January 1982

English

UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

THE IMPACT OF HIGHER ENERGY PRICES ON THE INDUSTRIALIZATION OF DEVELOPING COUNTRIES, WITH SPECIAL REFERENCE TO LEAST DEVELOPED COUNTRIES*

prepared by

Global and Conceptual Studies Branch
Division for Industrial Studies

to be submitted to the Third Meeting of the ACC Technical Energy Group

* This document has been reproduced without formal editing.

V.82-20427

TABLE OF CONTENTS

		Page
Section 1:	Introduction, Summary and Conclusions	1
1.1:	Introduction	1
1.2:	Summary and Conclusions	5
Section 2:	Higher Energy Prices in the World Economy	8
2.1:	The Impact of Higher Energy Prices	8
2.2:	Terms of Trade Effects	16
2.3:	Balance of Payments	23
Section 3:	Long Run Implications of Higher Energy Prices of Developing Countries	25
3.1:	Basic Assumptions	25
3.2:	Capital Requirements	27
3.3:	Policy Issues and Recommendations	28
References		31
Appendix		32

SECTION 1: INTRODUCTION, SUMMARY AND CONCLUSIONS

1.1 Introduction

This study examines the impact of higher energy prices on the growth, trade and industrialization of the developing countries. Such an undertaking is, in many respects, too broad to be managed satisfactorily within a purely conceptual framework. For this reason, considerable use is made of analysis of supporting data. On the other hand, the topic is too narrow in other respects to provide a reliable basis for policy prescription. As a result, this study tends to avoid direct discussion of energy and trade policies and industrialization strategies, but rather it draws freely on the global analysis of these issues by the World Bank (15). This approach is not without its limitations and, it would surely seem, can only be justified for want of an appropriate model. The development of a large-scale analytical model for policy purposes would be an indispensable asset to future investigations in energy research.[1/]

In the broadest sense, the focus of this research is the world economy. Because of the highly interrelated nature of world trade and growth, it is naive to proceed otherwise. Tables 1, 2 and 3 provide a variety of basic data for developed and developing countries in the world. Because much of the stress in this study is directed at the least-developed countries (or LDC's) in the world, data for them have been separately listed. Moreover, a complete country coverage for the LDC's, providing detailed socioeconomic, energy, and resource data, has been appended to the paper. While these text and appendix tables probably require little elaboration, two general observations are worthy of mention concerning the LDC's. First, the wide disparities between the LDC's and other developing countries (a fortiori, the developed countries in the world) in the economic sphere also exist perforce in the energy area. Electricity consumption per capita, for example, which is frequently suggested as an index of industrialization, is more than 12 times smaller in the LDC's vis-à-vis developing countries in general, and it is well over 200 times smaller as compared with developed countries.

1/ The model underlying IIASA's energy study (17) is exemplary, but its emphasis on long-term technical options obscures the more immediate adjustment problems confronting policy makers in the developing countries.

TABLE 1 : SOCIOECONOMIC INDICATORS FOR THE WORLD ECONOMY

	POPULATION			GROSS DOMESTIC PRODUCT (in US $)			ANNUAL AVERAGE GROWTH RATES						
							Exports		Imports		Share of World (%) Exports		
	Total, 1977 (in billions)	Avg. Annual Growth Rate 1970-77	Area (in billion Km²)	Per Capita 1977	Real Growth Rates[a] 1960-70	1970-79	1960-70	1970-79	1960-70	1970-79	1960	1970	1979
Developed Countries	769	0.8	33	6,471	5.1	3.3	10.0	19.0	10.2	19.5	66.8	71.1	65.5
Developing Countries	2,055	2.6	66	573	5.3	5.7	7.3	26.0	6.4	24.1	21.5	18.1	25.0
Oil Exporting Countries	318	2.9	15	1,158	6.2	7.6	8.1	32.6	6.5	33.3	6.8	6.2	13.4
Oil Importing Countries	1,736	2.5	52	466	5.1	5.4	6.7	20.9	6.4	20.9	14.9	11.7	11.6
Least Developed Countries	260	2.5	13	165	3.4	4.0	4.6	12.1	5.8	17.5	1.1	0.7	0.4

a/ Annual averages in 1970 US$

SOURCE: UNCTAD, Handbook of International Trade and Development Statistics, Supplement 1980.

TABLE 2: COMPARATIVE ENERGY CONSUMPTION PER CAPITA

	Primary (kilograms of coal equivalent)			Electricity (kilowatt hours)		
	1960	1970	1979	1960	1970	1979
World	1,368	1,781	2,019	772	1,355	1,849
Developed Market Economies	3,810	5,739	6,317	2,596	4,805	6,573
Developing Market Economies	211	302	437	97	204	360
Centrally Planned Economies	1,308	1,500	1,027	487	915	1,418
Africa Developing	77	129	193	60	119	164
Median LDC	22	42	52	5	21	28

SOURCE: Appendix Table 1 and United Nations, World Energy Supplies 1950 - 1974 and 1979 Yearbook of World Energy Statistics, various tables.

TABLE 3: BASIC INDICATORS OF COMMERCIAL ENERGY USE IN THE WORLD

	Average Annual Percentage Growth Rates								Percent Share Liquid Fuel in Total Energy Consumption			Percent Share of Net Imports in Energy Consumption		
	Production		Consumption		Consumption Per Capita		Refinery Capacity							
	1960-73	1973-78	1960-73	1973-78	1960-73	1973-78	1960-73	1973-78	1960	1973	1978	1960	1973	1978
Developed Countries	3.0	0.2	4.8	0.3	3.7	-0.2	7.4	3.1	38.3	52.4	51.7	17.4	37.8	37.0
Developing Countries	9.5	0.8	6.9	6.6	4.3	4.0	7.9	3.6	58.9	67.2	66.8	(63.8)	73.3)	(64.1)
Oil Exporters	10.3	-0.2	8.4	10.9	5.6	7.9	4.3	2.4	65.4	60.5	62.4	(91.3)	(93.7)	(88.7)
Oil-Importers	5.5	7.6	6.6	5.5	4.0	2.9	11.2	4.2	57.6	68.9	68.2	34.8	46.5	40.0
LDC's	32.8	1.2	11.9	3.0	6.0	0.4	6.5	1.2	95.1	83.0	81.8	102.3	55.5	63.2

SOURCE: UNCTAD, Handbook of International Trade and Development Statistics, Supplement 1980.

Second, with reference to the appendix tables, there also exist wide economic and energy-related disparities within the LDC's. Nominal GDP per head in 1978, for instance, was over 5 times greater in Samoa than in Bangladesh, with primary energy consumption per capita over 6 times greater.

Another important stress in this study is on the future growth and industrialization of the developing countries, especially in the 1980s. In this connection, there are two observations that can be drawn from the data in the accompanying tables. First, the evidence on growth rates in Table 1 indicates that there are widening disparities between the oil-exporting and the oil-importing developing countries. Such growth rate disparities are especially pronounced for the 1970's in which oil prices drastically escalated on world markets. This matter will be discussed more fully in Section 2. Second, and of even greater concern for the long run, there exist great disparities within the developing world in the distribution of energy resources. Referring to Table 4, the net oil-exporting countries have the preponderant shares of low cost resources (conventional and heavy oil and natural gas), except for coal. The net oil-importing countries have larger shares only in the costlier, capital-intensive areas of oil shale and hydroelectric power. With but several exceptions (Afghanistan, Bangladesh and Botswana), the LDC's only alternative to reducing oil imports in the 1980's is mostly development of their hydroelectric potential (see Appendix Table 3). The rising cost of oil is particularly acute for them since most must rely on outside refining.[2/]

2/ Only six of the thirty LDC's currently have petroleum refinery capacity. These are Bangladesh, Ethiopia, Somalia, Sudan, Tanzania and Yemen DR.

TABLE 1: WORLD FOSSIL FUEL RESOURCES AND HYDROELECTRIC POTENTIAL

	OIL RESERVES (in billions of Barrels)			GAS RESERVES	COAL (in billions of tons)		TOTAL HYDROELECTRIC CAPACITY
	Conventional	Heavy	Shale	(in billions of barrels of oil equivalent)	Resources	Reserves	(in thousands of megawatts)
World	640.6 (100%)	3,010.9 (100%)	3,263.8 (100%)	460.0 (100%)	10,125.3 (100%)	636.4 (100%)	2,342.6 (100%)
Developed Countries	58.8 (9.2%)	829.0 (27.5%)	2,217.5 (67.9%)	80.8 (17.6%)	3,434.4 (33.9%)	324.8 (51.0%)	533.1 (22.8%)
Centrally Planned Economies	90.0 (14.0%)	0.5 (0.0%)	140.7 (4.3%)	168.0 (36.5%)	6,458.6 (63.8%)	245.9 (38.6%)	615.2 (26.3%)
Developing Countries	491.8 (76.8%)	2,181.4 (72.5%)	905.6 (27.7%)	211.1 (45.9%)	232.2[a] (2.3%)	65.6[b] (10.3%)	1,194.4 (51.0%)
Net Oil Exporters	483.0 (75.4%)	2,176.4 (72.3%)	102.7 (3.1%)	196.4 (42.7%)	13.5 (0.1%)	3.7 (0.6%)	379.4 (16.2%)
Net Oil Importers	8.8 (1.4%)	5.0 (0.2%)	802.9 (24.6%)	14.7 (3.2%)	217.2 (2.1%)	59.4 (9.3%)	815.0 (34.8%)
LDC's	0.025 (0.0%)	0	0	1.68 (0.4%)	102.1 (1.0%)	4.0 (0.6%)	196.9 (8.4%)

a/ Coal resource subtotal for developing countries includes 1.4 billion tons for those countries for which individual country data are unavailable.

b/ Coal reserve subtotal for developing countries includes 2.5 billion tons for those countries for which individual country data are unavailable.

SOURCE: World Bank (16)

1.2 Summary and Conclusions

The impact of higher energy prices on the world economy in the 1970's is examined in Section 2. An overview of the problem is discussed in Section 2.1, and an attempt is made to correlate higher energy prices in general with higher world oil prices in particular. It is argued that the dramatic 1973-74 and 1979-80 price increases by OPEC had several consequences for the world economy. First, higher oil prices tend to instigate stagflation in the industrialized countries leading to a reduced volume of exports for the developing countries. Second, higher oil prices lead to large income transfers from oil consumers to oil producers, which are exacerbated by relative movements in the terms of trade that tend to favor oil-exporting countries vis-à-vis oil-importing countries in the developing world. Third, higher oil prices result in large current account deficits for the oil-importing developing countries that tend to increase their medium- and long-term debt and hence strain their ability to service that debt. This problem was comparatively more serious for the middle-income oil importers vis-a-vis the low-income oil-importing developing countries.

The terms of trade effects induced by higher oil prices are investigated in Section 2.2. In both the 1973-74 and 1979-80 episodes, subsequent movements in the terms of trade greatly favored developing countries as compared to developed countries and, among the developing countries, oil exporters (viz. OPEC) as compared to oil importers. For instance, it is found that the $ 7 billion surplus in 1978 for developed countries became a $ 136 billion deficit in 1980 prices, the $ 51 billion surplus in 1978 for OPEC became a $ 217 billion surplus in 1980 prices, and the $ 43 billion deficit for non-OPEC countries in 1978 became a $ 69 billion deficit in 1980 prices. The terms of trade discussion is extended to include export-import volume effects in Section 2.3, however only the 1973-74 price episode is treated. A balance of payments approach is employed and attention is restricted to the oil-importing developing countries. It is observed that the combination of higher oil import expenditures and reduced export earnings caused current accounts to remain in deficit throughout the 1970's. Regarding financing, the evidence reveals that the LDC's relied relatively more on aid, and less on borrowing, than oil-importing developing countries in general.

The last section of the paper examines the implications of higher energy prices for developing countries in the 1980's. Basic assumptions and projections used in the analysis are adopted from the World Bank (15), and these are described in Section 3.1. In addition, they form the basis for the estimates of capital requirements in the oil-importing developing countries discussed in Section 3.2. Although the paucity of detailed forecasts on the sectoral growth of production prevents a complete investigation, aggregate trends in capital requirements are possible to construct. Decomposing growth in real output over the 1980's by sector aggregates (agriculture, industry, manufacturing and services), direct and total capital requirements to warrant this growth are obtained. For the middle-income oil-importing developing countries, the projected $ 580 billion increase in real output in the 1980's will call for an additional $ 682 billion in direct capital and over $ 1, 157 billion in total capital. Nearly half of these sums is required for industrial growth, most of which (about two-thirds) needed in the manufacturing area. For the low-income group, the projected $ 45 billion increase in real output in the 1980's will call for an additional $ 123 billion in direct capital and over $ 213 billion in total capital. Somewhat more than one-third of these sums is necessitated by industrial growth.

A discussion of the most important consequences of higher oil prices for the nonoil developing countries in the 1980's, along with policy recommendations to mitigate their negative impacts, is taken up in Section 3.3. Among other things, higher oil prices will result in the reallocation of scarce reserves away from capital goods and raw materials toward additional outlays on energy imports. At the same time, the possible stagflation induced in industrialized countries will tend to reduce their aid flow and import demand, at least in the near term. It is recommended that the nonoil developing countries gradually supplant import-substitution strategies by export promotion, so that they may be able to take full advantage of the expansion in trade made possible by the anticipated recovery of the industrialized countries in the 1980's. Additionally, they should strive to increase their domestic investment and savings rates and, moreover, improve upon the productivity of existing and new investments. It is also recommended that a greater burden for financial assistance be assumed by official agencies in the 1980's, in order to augment the possibly inadequate flow of recycled oil surpluses through international capital markets. Naturally, the capital-surplus oil exporters should be encouraged to recycle their oil earnings by means of increased holdings of foreign assets, expanded purchases of exports, and additional financial support to the developing countries. Finally, it is recommended that the industrialized countries avoid excesses in domestic deflationary policies. They should strive to expand their financial aid and commercial lending to the developing countries. In addition, they should continue to foster domestic energy policies that promote the conservation of scarce fossil fuels (viz. oil and gas) and that promote the development of alternative energy sources. Taken together, all these policies ought to assist the nonoil developing countries in their industrialization and growth throughout the decade.

SECTION 2: HIGHER ENERGY PRICES IN THE WORLD ECONOMY

2.1 The Impact of Higher Energy Prices

As Table 5 vividly illustrates, the relatively stable world oil prices of the 1960's stand in stark contrast to the rapidly rising price levels of the 1970's. In real terms, oil prices declined over the period 1960-70 at an annual average rate of 1.5 per cent, whereas over the period 1970-80 they increased at an annual average rate of nearly 20 per cent. The sharp rises in 1973-74 and 1979-80 are dramatically manifest in Figure 3. Saudi Arabian light crude oil, which averaged $2.70 per barrel in 1973, averaged $ 32.00 per barrel for the first quarter of 1981. This represents nearly a twelve-fold increase in the nominal price of "marker crude" over the last seven years. Whereas it is unlikely that this degree of increase can be duplicated by OPEC in the 1980's, the official consensus is that world oil prices will continue to rise in real terms throughout the decade.[3/]

There are several reasons why higher oil prices are tantamount to higher energy prices generally. First, as is depicted in Figure 1, fossil fuel prices have historically moved together, in both direction and degree. Indeed, since 1973, the price path of crude petroleum has been virtually identical to the weighted-average (or combined) fossil-fuel price path in international trade (see Figure 2). Second, the relative importance of oil in total energy imports is not expected to change appreciably over the 1980's. For example, oil-importing developing countries imported 6.1 million barrels of oil equivalent per day in 1976, 6.0 million barrels of which were oil (the balance of 0.1 million barrels was coal). Recent projections of Lambertini (9) indicate that all of their anticipated 10.8 million barrels per day of energy imports for 1990 will be comprised of oil. Similarly the share of imported oil in the total energy consumption of industrialized countries has remained virtually unchanged at approximately 40 per cent since 1973 and thus, in view of the unprecedented oil price experience, this figure would not be expected to change appreciably over the coming decade.

3/ See, for example, OECD (10), IMF(8), and World Bank (15). At this writing, OPEC delegates are convened in New York for the purpose of determining future oil price increases. It is believed that the $32.00 per barrel price on marker crude will shortly be raised to $34.00 per barrel. See International Herald Tribune, Friday, August 14, p. 7.

TABLE 5: REALIZED PRICE OF SAUDI ARABIAN LIGHT CRUDE OIL, 34° - 34.9° API GRAVITY, F.O.B. RAS TANURA

YEAR	CURRENT[a]	REAL[b]	DEFLATOR[c]
1960	1.50	3.42	43.9
1961	1.45	3.28	44.2
1962	1.42	3.25	43.7
1963	1.40	3.19	43.9
1964	1.33	2.99	44.5
1965	1.33	2.89	46.0
1966	1.33	2.87	46.4
1967	1.33	2.82	47.1
1968	1.30	2.95	44.1
1969	1.28	2.88	44.5
1970	1.30	2.65	49.1
1971	1.65	3.11	53.1
1972	1.90	3.25	58.4
1973	2.70	3.87	69.8
1974	9.78	11.25	86.9
1975	10.72	10.72	100.0
1976	11.51	11.29	101.9
1977	12.40	11.33	109.4
1978	12.70	10.09	125.9
1979	17.26[d]	11.91	142.7
1980	30.22[d]	19.13	158[d]
1981, I	32.00[d]	20.38	157[d]

a/ U S. dollars per barrel

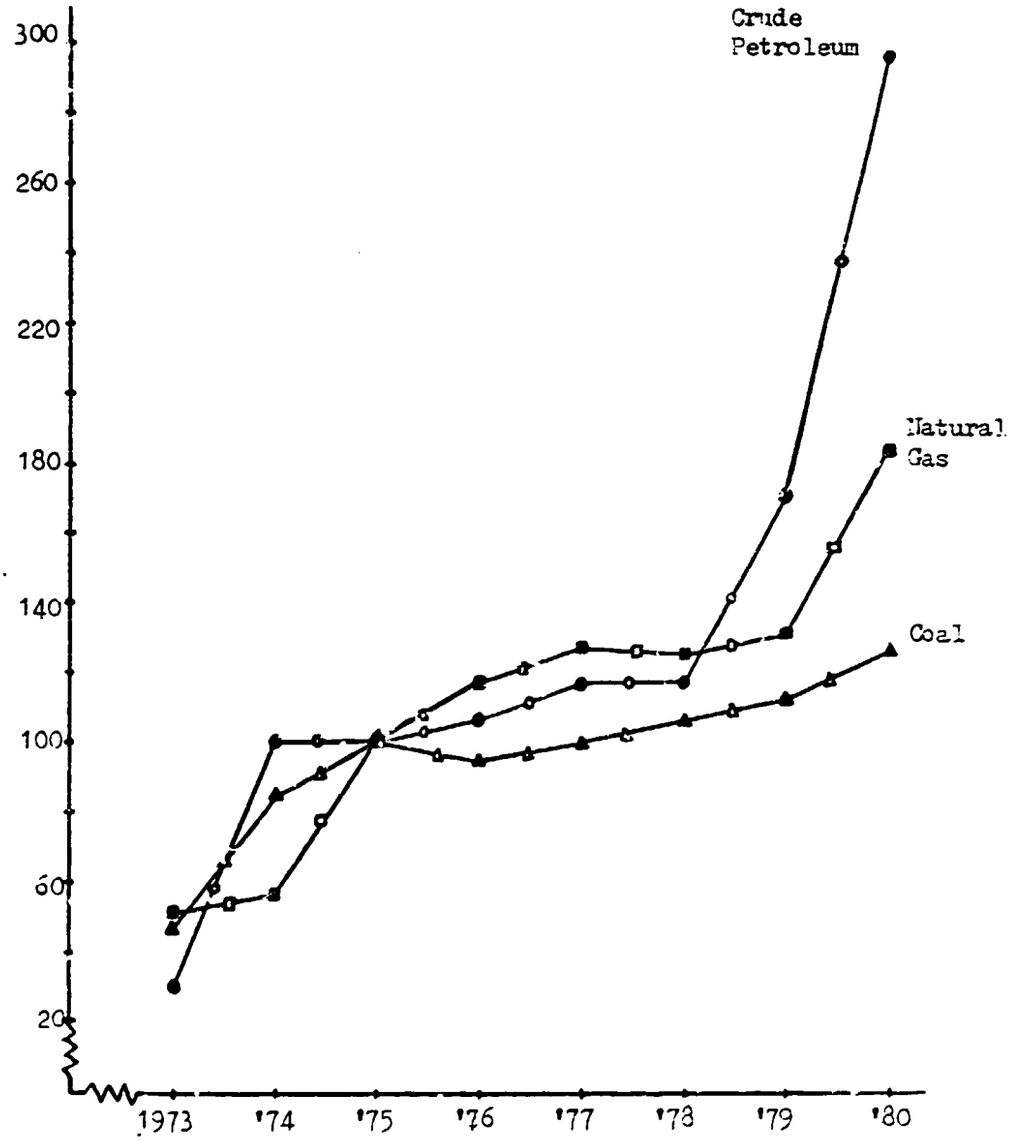
b/ 1975 constant dollars

c/ International price index, viz. the c.i.f. unit value index of exports of manufactured goods for developed market economies.

d/ Recent and/or revised data are taken from UN, Monthly Bulletin of Statistics, June 1981.

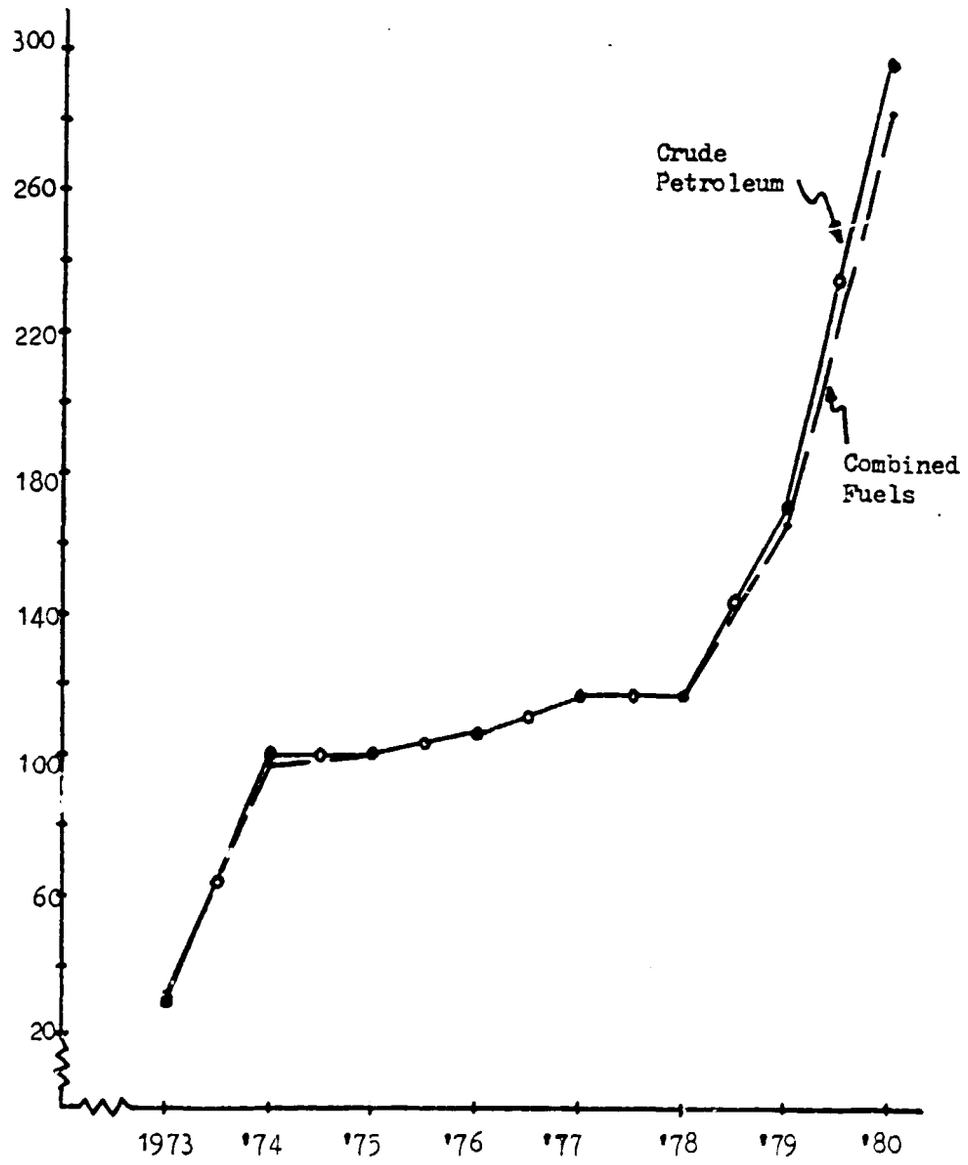
SOURCE: World Bank, Commodity Trade and Price Trends, August 1980.

Figure 1: World Export Price Indexes for Selected Fuels, 1975 = 100



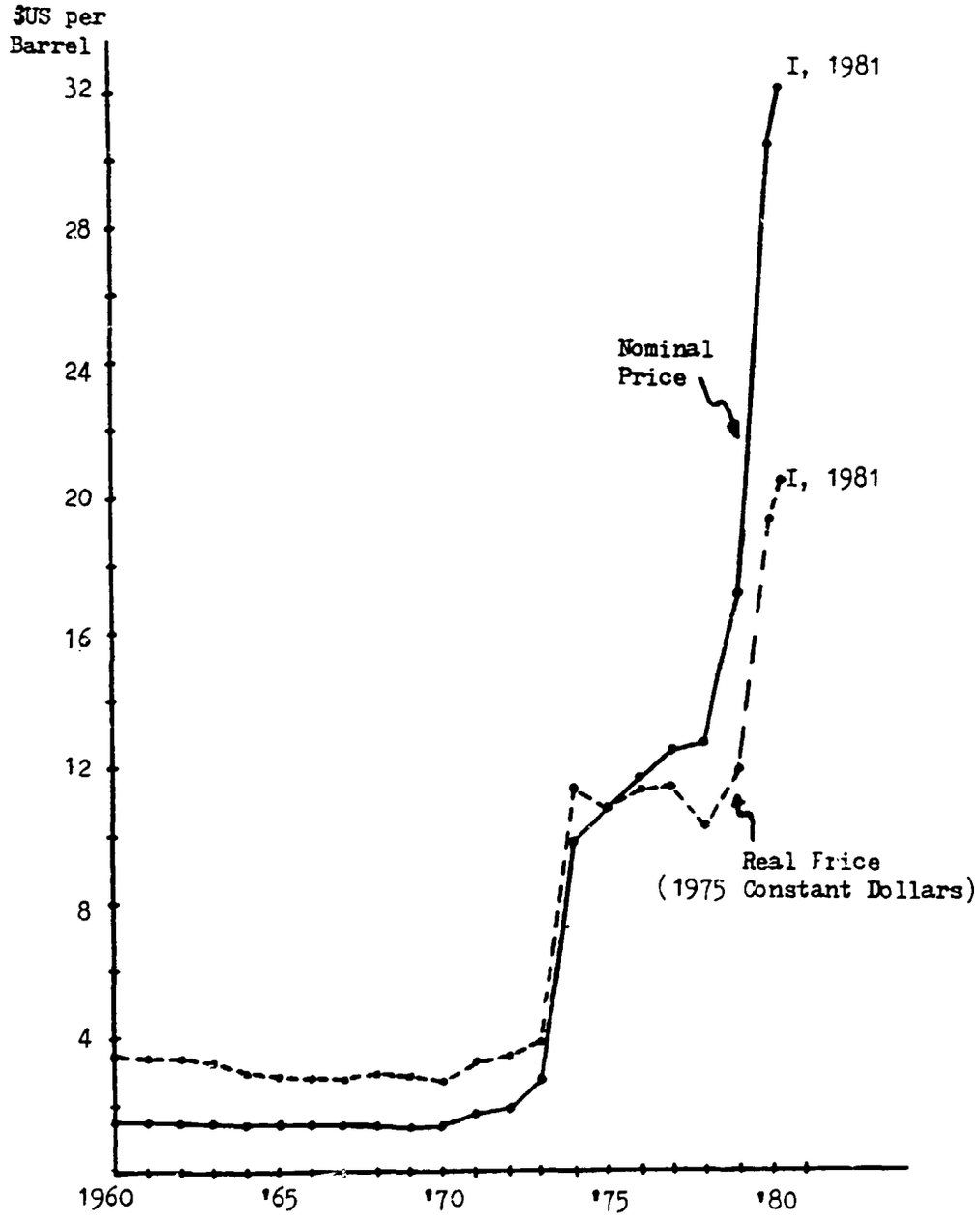
SOURCE: UN, Monthly Bulletin of Statistics, April 1981

Figure 2: Crude Petroleum and Combined Fuels World Export Price Indexes, 1975 = 100



SOURCE: UN, Monthly Bulletin of Statistics, April 1981

Figure 3: Nominal and Real Price Paths for Crude Petroleum *



* Saudi Arabian light crude oil, 34° - 34.9° API gravity, f.o.b. Ras Tanura

SOURCE: Table 5

Third, the extent to which conventional and nonconventional energy supplies may be substituted for oil appears to be rather limited, especially within the developing countries (4). Within the industrialized countries, empirical results obtained by Griffin (6) suggest only a moderate degree of interfuel substitutability.[4/] The use of nonconventional energy forms are not expected to figure predominantly within the industrialized countries in the near future (3).

There have been various, interrelated consequences for the world economy of higher oil prices in the 1970's. Although certain aspects of these economic consequences will be examined in more detail below, a general overview is the following.[5/] An obvious, initial impact of the dramatic rise in world oil prices in 1973-74 was the decline in aggregate demand and associated cost-push inflation generated in the industrialized and nonoil developing countries, although it remains still highly uncertain as to the extent which global stagflation in the 1970s is caused by higher oil prices. (see Table 6). Among the industrialized countries, real economic growth fell from a 6 per cent rate in 1973 to virtually nil in 1974, only to proceed at a negative 1 per cent growth rate in 1975. Meanwhile, the inflation rate nearly tripled the long-run rate of 4 per cent in 1974, remained at 11 per cent in 1975, and then fell to 7 per cent thereafter. A slightly different response is observed for the nonoil developing countries. Although inflation rates rose proportionally the same (about 50 per cent) in 1974-75 as in the industrialized world, the decline in real economic growth rates was much less marked. A plausible explanation for this distinction is that for the nonoil developing countries the problems of higher oil prices center chiefly around their impact on foreign-exchange earnings and reserves, rather than on aggregate

---

4/ He obtains cross-price elasticity estimates of 0.25 for gas and 0.48 for coal, relative to the price of fuel oil, in electricity generation in the OECD countries.

5/ An excellent overview of the impacts of the 1973-74 oil price rise on the world economy is (5).

TABLE 6: COMPARATIVE GROWTH AND INFLATION RATES, 1973–78

	1976–72[a]	1973	1974	1975	1976	1977	1978
Industrialized Countries							
Inflation Rate[b]	4.1	7.3	11.9	11.0	7.1	7.1	7.0
Real Growth Rate[c]	4.6	6.1	0.2	−0.9	5.4	4.0	4.0
Nonoil Developing Countries							
Inflation Rate[d]	10.1	22.1	33.0	32.9	29.9	29.7	24.6
Real Growth Rate[e]	6.1	7.3	5.3	4.1	5.0	5.1	5.2

a/ Annual average rate of change.

b/ Per cent change in GNP deflator.

c/ Per cent change in real GNP.

d/ Per cent change in real GDP.

SOURCE: Dunkerley (2).

demand. Indeed, without their heavy borrowing to finance current account deficits over the period 1973-78, there is little doubt that real economic growth rates among the nonoil developing countries would have been much lower.[6]

A second obvious impact of a dramatic rise in oil prices is the income transfer from consumers to producers of energy. Although producers initially accumulate a large amount of unspent surpluses, these are gradually recycled back to oil consumers in the form of increased export expenditures, development assistance, and direct investment. Powelson (11) has estimated that of the additional $ 63 billion the industrialized countries paid to OPEC for oil imports in 1975 over 1970, $ 35 billion was returned in the form of increased exports, $ 4 billion in the form of direct investment, and over $ 16 billion in the form of reserves held as deposits and securities [illegible] nonoil developing countries spent an additional $ 11 billion for oil [illegible]s in 1975 over

6/ Excluding official transfers, current account deficits of the nonoil developing countries amounted, in real terms (1977 constant dollars), to $ 9.2 billion in 1973, $ 44.4 billion in 1975, $ 23.5 billion in 1978, and $ 43.2 billion in 1980 following the 1979 oil price increase. As a percentage of GNP, these amounts correspond to 1.1, 5.1, 2.3, and 3.9, respectively. See (15).

1970, receiving $ 5 billion back in the form of additional exports and over $ 1 billion in foreign aid. Unfortunately, the trade balances of nonoil developing countries with industrialized countries deteriorated over $ 12 billion in 1975 as compared to 1970. Thus, relative to 1970, in 1975 the nonoil developing countries were in deficit an additional $ 17 billion, which was financed largely by loans from governments and banks in the industrialized world, from international lending agencies, and by the drawing down of reserves. Powelson's analysis surely demonstrates the importance within the world economy of the indirect as well as the direct effects of the OPEC price increase. However, his analysis is flawed by his neglect of the terms of trade effects induced by the rise in oil prices. For this reason, the income-transfer problem will be more carefully examined in the following subsection.

A third obvious impact of the dramatic rise in world oil prices is the increased debt burden of oil consumers arising from the "unpaid" portion of current oil imports, i.e., the difference between the increase in oil imports and the net change in exports. The corresponding increase in the reserves of oil producers tend to be held in the industrialized countries and, as such, they constitute claims against future goods and services produced in the industrialized world. Through inflation and currency devaluation, inter alia, the industrialized countries are in a position to defend themselves in case these claims are exercised. Unfortunately, for the nonoil developing countries, whose debts are specified in currencies other than their own, such defensive measures are inapplicable and they must rely on borrowing and official finance (inclusive of aid). Their worsening current account aggravates their debt-service capability (hence, creditability) so that commercial borrowing is likely to cost more, and more of what is borrowed will be required to repay principal and interest on outstanding debt.[7/] For instance, in 1975 more than one-half of the $ 49 billion borrowed medium- and long-term by developing countries was available for imports and reserves, whereas in 1980 less than one-third of the $ 97 billion in corresponding borrowing was so available.

7/ However, the increased cost of commercial borrowing appears to be largely inflation-induced rather than due to increased risk of insolvency, especially in recent years. For example, in 1976 the LIBOR rate was 6.3% with a 1.7% spread for developing countries. In 1979 the LIBOR rate stood at 12.1% but the spread for developing countries had dropped to 0.9%.

The evidence strongly suggests that the debt problem presented a greater burden to middle-income oil importers vis-à-vis low-income oil importers. Over the period 1970-78, external public debt as a percentage of GNP increased from 18.1 to 21.7 for the low-income countries and from 10.8 to 17.6 for the middle-income group. However, the interest and principal repayment service on this debt as a percentage of GNP increased from 1.2 to 1.7 for the low-income countries but from 1.5 to 2.9 for the middle-income group. Debt service as a percentage of exports actually declined for the low-income countries from 12.3 to 11.7, whereas it rose for the middle-income group from 9.3 to 13.8. At the end of 1978, reserves among the low-income countries covered 3.5 months' of imports, yet reserves among the middle-income group covered only 2.5 months. In 1977 constant dollars, the World Bank (15) reports that over the period 1975-80 total debt in the low-income countries rose from $ 30.9 billion to $ 32.3 billion (an increase of 4.5%), whereas total debt in the middle-income group rose from $ 115.5 billion to $ 171.2 billion (an increase of 48.2%). It is generally agreed that growth prospects in the 1980's for the middle-income oil importers will be favorable only if they can progressively reduce their reliance on external borrowing by means of export expansion (7).

A recent unpublished study by UNIDO shows, however, that for the period 1973-79 the bilateral trade deficits of the least developed countries (LDCs) with the OPEC countries, as well as with the DAC countries, were both covered by bilateral ODA, and particularly OPEC bilateral ODA covered over 95 per cent of the LDC's total import bills over the same period. In the case of the non-LDC oil importing developing countries, 39.4 per cent of their bilateral trade deficits with the DAC countries was covered by ODA, 34.1 per cent for the planned economies and 14.7 per cent for OPEC countries respectively for the period 1973-79. The difference in the relative importance of ODA to trade deficits of these two groups stems mainly from two different orders of magnitude of their trade deficits. For instance, the trade deficits of LDCs were only ten per cent of those of oil importing developing countries excluding LDCs in 1979.

2.2 Terms of Trade Effects

Increases in world oil prices raise import costs directly to oil-consuming nations but also indirectly through the increased cost of other imported commodities. As mentioned earlier, these indirect effects may be quite substantial and, for purposes of analysis, may be taken to result from changes in relative commodity prices induced by the initial rise in

oil prices. Since all increases in the cost of imports must ultimately be borne by the oil-consuming nation, the sum of the direct and indirect effects of the oil price increase is a more meaningful measure of the impact of higher energy prices than merely the direct effect alone. The present approach to this problem follows the framework developed by Tims (13) for the 1973-74 price increase, however a different country classification has been adopted. 8/ In order to stress the position of OPEC in the world economy, the developing countries have been simply divided into the two groups, OPEC and non-OPEC. In addition, developed countries have been included as a group in order to capture their role in the two major increases in world oil prices in the 1970's.

The distribution of exports and imports in five major commodity classes is given in Table 7 for each country group in the years 1973 and 1978. These years, more or less, immediately precede the years in which world oil prices dramatically increased. The commodity distribution percentages, together with the export and import volumes in Table 8, provide each group's trade balances in each of the major commodity classes: (i) all food items; (ii) agricultural raw materials; (iii) ores and metals; (iv) fuels; and (v) manufactured goods. Note that this commodity classification covers over 95 per cent of each group's international trade, so that virtually all trade is being included. Export price indices for each commodity group are also given in Table 8 for the periods 1973-75 and 1978-80. Therefore, it is possible to ascertain the terms of trade effects induced by the two major oil price increases by expressing 1973 commodity trade balances in terms of price levels for 1974 and 1975 and 1978 commodity trade balances in terms of price levels for 1979 and 1980.

8/ Algebraically the terms of trade effects can be stated as $(M_{io}-X_{io})(P_{i1}/P_{io})$ where M_{io} and X_{io} are imports and exports of ith commodity at the base year (0) respectively, P_{io} the market price of ith commodity at the base year, and P_{i1} the price of ith commodity at the year 1. It is assumed that the export price of each commodity is equal to the import price of the same commodity. Furthermore, it should be noted that the terms of trade effects measured by this formula overstate the impact of higher energy prices except fuels, since the entire portion of an increase in the commodity prices can not be attributed to the oil price increase alone as calculated in this paper. It is more likely that such commodity price increases are, to a large extent, caused by factors other than the oil price increase. Moreover, Belassa's formula (1, p.1) for measuring the terms of trade effects may yield more revealing results. Namely, they are calculated by the formula $(P_{01}^{m}M_{1} - P_{01}^{x}X_{1})$, where P_{01}^{m} and P_{01}^{x} refer to percentage changes in import and export prices between years 0 and 1, and M and X denote merchandise imports and exports valued in the base year (0) prices. The terms of trade effects are then further decomposed into a pure terms of trade effect calculated on the assumption of balanced trade in base year prices, $(P_{01}^{m} - P_{01}^{x})X_{1}$, and the effects of increased import prices on unbalanced trade, $(M_{1} - X_{1})P_{01}^{m}$. The Belassa's method could not be applied here due to lack of appropriate data for the groups of countries selected for this study.

TABLE 7: TRADE DISTRIBUTION OF MAJOR COMMODITY GROUPS, 1973 AND 1978

I. Distribution of Exports (%) of Market Economies

	DEVELOPED		DEVELOPING		OPEC		NON-OPEC	
Commodity Group	1973	1978	1973	1978	1973	1978	1973	1978
All food items[a]	13.7	11.6	21.3	16.4	3.6	2.3	32.7	29.6
Agricultural raw materials [b]	5.1	3.6	9.3	4.8	4.7	1.6	12.3	7.7
Ores and metals[c]	10.8	9.4	8.8	5.4	1.4	0.7	13.6	9.8
Fuels[d]	3.5	4.6	39.6	52.3	88.7	93.5	7.9	15.0
Manufactured goods[e]	65.6	69.2	20.0	20.1	1.4	1.3	32.0	37.6

II. Distribution of Imports (%) of Market Economies

	DEVELOPED		DEVELOPING		OPEC		NON-OPEC	
Commodity Group	1973	1978	1973	1978	1973	1978	1973	1978
All food items[a]	15.0	12.6	14.7	11.5	13.4	10.9	15.0	11.7
Agricultural raw materials [b]	6.3	4.4	4.6	2.9	2.4	1.3	5.1	3.7
Ores and metals[c]	10.7	8.2	8.2	7.0	10.2	7.5	7.8	6.8
Fuels[d]	12.3	19.2	8.4	13.4	1.4	2.2	10.0	18.6
Manufactured goods[e]	54.6	54.2	59.7	61.2	69.9	73.7	57.3	55.3

a/ SITC 0 + 1 + 22 + 4

b/ SITC 2 - 22 - 27 - 28

c/ SITC 27 + 28 + 67 + 68

d/ SITC 3

e/ SITC 5 to 8 less (67 + 68)

SOURCES: UNCTAD, Handbook of International Trade and Development Statistics, 1976 and Supplement, 1980.

TABLE 8: TRADE BALANCES IN MAJOR COMMODITY GROUPS, 1973 AND 1978

I. Exports and Imports in All Product Categories

	DEVELOPED		DEVELOPING		OPEC		NON-OPEC	
(in billions $US)	1973	1978	1973	1978	1973	1978	1973	1978
Exports	406.7	872.0	108.8	300.8	42.7	144.9	66.1	155.9
Imports	408.9	863.5	104.0	303.5	20.2	97.1	83.8	206.4

II. Export Price Indices for Major Commodity Groups

(1975-77=100)	1973	1974	1975	1978	1979	1980
All food items	70	104	82	108	117	136
Agricultural raw materials	92	102	85	123	151	168
Ores and metals	91	120	98	111	143	164
Fuels, 1975=100	32	97	100	117	165	281
Manufactured goods, 1975=100	73	89	100	125	143	155

III. Trade Balances in Major Commodities[a/]

	DEVELOPED		DEVELOPING[b/]		OPEC		NON-OPEC	
(in billions $US)	1973	1978	1973	1978	1973	1978	1973	1978
All food items	(5.6)	(7.6)	7.9	14.4	(1.2)	(7.3)	9.0	22.0
Agricultural raw materials	(5.0)	(6.6)	5.3	5.6	1.5	1.1	3.9	4.4
Ores and metals	0.2	11.2	1.0	(5.0)	(1.5)	(6.3)	2.5	1.2
Fuels	(36.1)	(125.7)	34.3	118.2	37.6	133.4	(3.2)	(15.0)
Manufactured goods	43.5	135.4	(40.2)	(125.3)	(13.5)	(69.7)	(26.9)	(55.5)
Total major commodities	(3.0)	6.7	8.3	7.9	22.9	51.2	(14.7)	(42.9)

a/ Figures in parentheses are negative amounts

b/ OPEC plus non-OPEC row entries may not precisely correspond to the combined entry for developing countries because of rounding.

SOURCES: UNCTAD, Handbook of International Trade and Development Statistics, 1976 and Supplement, 1980, and Table.

Results on these terms of trade effects are reported in Table 9. The $ 3 billion deficit in all major commodities for developed countries was nearly $ 67 billion greater in 1974 prices and over $ 61 billion greater in 1975 prices. This was principally due to the increased import cost of fuels ($ 73 billion greater in 1974 and $ 77 billion greater in 1975), which was only slightly offset by the improvement in the export earnings on manufactured goods ($ 10 billion greater in 1974 and $ 16 billion greater in 1975). As a group, developing countries' trade surplus of $ 8 billion in 1973 amounted to $ 47 billion and $ 67 billion in 1974 and in 1975 prices, respectively. Their $ 8 billion surplus in 1978 swelled to $ 40 billion in 1979 prices and, in 1980 prices, exceed $ 146 billion. In both the 1973 and the 1978 instances, terms of trade effects bloated fuel surpluses much more than the deficits on manufactured goods. However, the grouping together of OPEC and non-OPEC countries would seem to conceal more than it reveals.

OPEC countries, unlike their non-OPEC counterparts in the developing world, ran trade surpluses in both 1973 and 1978. The movement of fuel prices in 1974 and 1975 gave rise to large income transfers with respect to their 1973 volume of fuel exports that caused the quadrupling of their 1973 trade surplus in terms of 1974-75 price levels. Similarly, OPEC's 1978 trade surplus of $ 51 billion nearly doubled in 1979 prices and more than quadrupled in 1980 prices. Meanwhile, changes in the terms of trade of major commodities exacerbated the 1973 and 1978 trade deficits of the non-OPEC developing countries. The additional $ 7 billion paid on 1973 volumes in 1974 jumped to over $ 15 billion in 1975. This was principally due to rising prices on their main import items, fuels and manufactured goods, but partly due to falling prices on all food items, their main export. Whereas the price of food steadily rose in 1979 and 1980, the 1978 trade deficit of $ 43 billion for non-OPEC countries deteriorated to $ 55 billion in 1979 and to $ 69 billion in 1980, as a result of the even more rapid increases in the prices of manufactured goods and, especially, fuels.

An alternative framework for demonstrating the gains and losses from changes in the terms of trade is by way of an income classification of developing countries. The UNCTAD Secretariat has recently published unit value indices according to such a classification, and these are presented in Table 10. Unfortunately, because these indices are unavailable for the year 1980, only the 1973-74 oil price increase can be investigated. As before, the large gain to developing countries vis-à-vís developed countries in terms of future prices obscures the fact that oil-exporting countries were huge gainers and the oil-importing developing countries were moderate losers with respect to their 1973 balance of trade. The 1974 terms of trade, in particular, which so devastated developed countries, actually improved the trade balances

TABLE 9: TERMS OF TRADE EFFECTS BY MAJOR COMMODITIES, 1973-75 AND 1978-80

	1973 Volumes (in billions $US) at Prices for the Years:			1978 Volumes (in billions $US) at Prices for the Years:			Net changes in trade balances			
Developed Countries	1973	1974	1975	1978	1979	1980	1974	1975	1979	1980
All food items	(5.6)	(8.3)	(6.6)	(7.6)	(8.2)	(9.6)	(2.7)	(1.2)	(0.6)	(2.0)
Agricultural raw materials	(5.0)	(5.5)	(4.6)	(6.6)	(8.1)	(9.0)	(0.5)	0.4	(1.5)	(2.4)
Ores and metals	0.2	0.3	0.2	11.2	14.4	16.5	0.1	0.0	3.2	5.3
Fuels	(36.1)	(109.4)	(112.8)	(125.7)	(177.3)	(301.9)	(73.0)	(76.7)	(51.6)	(176.2)
Manufactured goods	43.5	53.0	59.6	135.4	154.9	167.9	9.5	16.1	19.5	32.5
Total major commodities	(3.0)	(69.9)	(64.2)	6.7	(24.3)	(136.1)	(66.9)	(61.2)	(31.0)	(142.8)
Developing Countries										
All food items	7.9	11.7	9.3	14.4	15.6	18.1	3.2	1.4	1.2	3.7
Agricultural raw materials	5.3	5.9	4.9	5.6	6.9	7.6	0.6	(0.4)	1.3	2.0
Ores and metals	1.0	1.3	1.1	(5.0)	(6.4)	(7.4)	0.3	0.1	(1.4)	(2.4)
Fuels	34.3	108.0	107.2	118.2	166.7	283.9	69.7	72.9	48.5	165.7
Manufactured goods	(40.2)	(49.0)	(55.1)	(125.3)	(143.3)	(155.4)	(8.8)	(14.9)	(18.0)	(30.1)
Total major commodities	8.3	73.9	67.4	7.9	39.5	146.8	65.0	59.1	31.6	138.9
OPEC										
All food items	(1.2)	(1.8)	(1.4)	(7.3)	(7.9)	(9.2)	(0.6)	(0.2)	(0.6)	(1.9)
Agricultural raw materials	1.5	1.7	1.4	1.2	1.4	1.5	0.2	(0.1)	0.3	0.4
Ores and metals	(1.5)	(0.2)	(1.6)	(6.3)	(8.1)	(9.3)	(0.5)	(0.1)	(1.8)	(3.0)
Fuels	37.6	114.0	117.5	133.4	188.1	320.4	76.4	79.9	54.7	187.0
Manufactured goods	(13.5)	(16.5)	(18.5)	(69.7)	(79.7)	(86.4)	(3.0)	(5.0)	(10.0)	(16.7)
Total major commodities	22.9	95.4	97.4	51.2	93.8	217.0	72.5	74.5	42.6	165.8
NON-OPEC										
All food items	9.0	13.4	10.5	22.0	23.8	27.7	4.4	1.5	1.8	5.7
Agricultural raw materials	3.9	4.3	3.6	4.4	4.8	6.0	0.4	(0.3)	0.4	1.6
Ores and metals	2.5	3.3	2.7	1.2	1.5	1.8	0.8	0.2	0.3	0.6
Fuels	(3.2)	(9.7)	(10.0)	(15.0)	(21.2)	(36.0)	(6.5)	(6.8)	(6.2)	(21.0)
Manufactured goods	(26.9)	(32.8)	(10.0)	(55.5)	(63.5)	(68.8)	(5.9)	(9.9)	(8.0,	(13.3)
Total major commodities	(14.7)	(21.5)	(30.0)	(42.9)	(54.6)	(69.3)	(6.8)	(15.3)	(11.7)	(26.4)

SOURCE: Table 8

TABLE 10: GAINS AND LOSSES FROM TERMS OF TRADE, 1973 - 78

	Unit Value Indices, 1975 = 100					1973 Volume (in billion $US) at Prices for the Year:				1973 Balances (in billions in Real Terms for the Year:			
	1973	1974	1976	1978		1973	1974	1976	1978	1973	1974	1976	1978
Developed Countries													
Export Prices	72	89	100	123	Exports, f.o.b.	408.1	504.5	566.8	697.2				
Import Prices	65	92	101	122	Imports, c.i.f.	429.9	608.5	668.0	806.9				
Terms of Trade	110	97	99	100	Trade Balance	(21.3)	(104.0)	(101.2)	(109.7)	(19.8)	(22.5)	(22.0)	(21.8)
Developing Countries													
Export Prices	44	101	104	118	Exports, f.o.b.	110.5	253.6	261.2	196.3				
Import Prices	68	95	102	122	Imports, c.i.f.	98.9	138.2	148.4	177.4				
Terms of Trade	65	106	102	97	Trade Balance	11.6	115.4	112.8	118.9	7.5	12.3	11.8	11.3
Oil-Exporting Countries[a]													
Export Prices	26	93	107	118	Exports, f.o.b.	44.0	158.1	181.2	200.6				
Import Prices	73	94	101	125	Imports, c.i.f.	22.4	28.8	31.0	38.4				
Terms of Trade	36	99	106	94	Trade Balance	21.8	129.3	150.9	162.2	7.8	21.6	23.1	20.5
Oil-Importing Countries[b]													
Export Prices	71	102	102	119	Exports, f.o.b.	66.6	94.8	94.8	110.6				
Import Prices	65	94	103	121	Imports, c.i.f.	76.4	110.5	121.1	142.2				
Terms of Trade	109	109	99	98	Trade Balance	(10.3)	(15.7)	(26.3)	(31.6)	(9.4)	(9.4)	(10.4)	(10.5)
Middle-Income Countries[c]													
Export Prices	53	93	101	113	Exports, f.o.b.	17.2	30.2	32.8	36.7				
Import Prices	68	94	102	122	Imports, c.i.f.	17.6	24.3	26.4	31.6				
Terms of Trade	78	99	99	91	Trade Balance	(0.4)	5.9	6.4	5.1	(0.5)	(0.4)	(0.4)	(0.4)
Low-Income Countries[d]													
Export Prices	66	107	103	127	Exports, f.o.b.	20.8	33.7	32.5	40.0				
Import Prices	66	94	102	122	Imports, c.i.f.	22.3	31.8	34.5	41.2				
Terms of Trade	100	114	101	104	Trade Balance	(1.5)	1.9	(2.0)	(1.2)	(1.5)	(1.3)	(1.5)	(1.4)
Least-Developed Countries[e]													
Export Prices	75	94	114	136	Exports, f.o.b.	2.7	3.5	4.1	4.9				
Import Prices	70	95	102	123	Imports, c.i.f.	4.0	5.4	5.8	7.0				
Terms of Trade	107	102	112	111	Trade Balance	(1.2)	(1.9)	(1.7)	(2.1)	(1.1)	(1.2)	(1.1)	(1.1)

a/ Major petroleum exporters for which petroleum and petroleum products accounted for more than 50 per cent of total exports in 1974. These countries, in addition to members of OPEC, include Angola, Bahrain, Brunei, Oman, Trinidad and Tobago.

b/ Developing countries not classified as major petroleum exporters.

c/ Per capita GDP in 1977 from $500 to $1000. This income group includes the OPEC member, Ecuador.

d/ Per capita GDP in 1977 under $500. This income group includes Angola and the OPEC members, Indonesia and Nigeria.

e/ The UN official category of thirty countries. The full list is presented in Appendix Table 1.

f/ The 1973 trade balance deflated by the prevailing terms of trade.

SOURCE: UNCTAD, Handbook of International Trade and Development Statistics, Supplement 1980.

of middle- and low-income developing countries in contrast to the least-developed countries. However, subsequent movements in the terms of trade, viz. in 1976 and 1978, clearly favoured only the middle-income countries. In real terms, however, all income groups exhibit a modest, fairly stable trade deficit over the period 1974-78 on their 1973 balance.

2.3 Balance of Payments

The deterioration in the position of the oil-importing countries, as calculated from 1973 and/or 1978 volumes of trade, does not take into account the impact of changes in the volume of trade in intervening years. As discussed in the overview of subsection 2.1, higher oil prices can induce adverse volume effects (e.g. reduced level of exports to industrialized countries) as well as adverse terms of trade effects for oil-importing developing countries. The appropriate framework for such general considerations is the balance of payments summary. This approach has been utilized recently by Belassa (1) in order to assess the overall effects of the 1973-74 oil price increase on a selected group of nonoil middle-income countries. However, it has not as yet been extended to the low-income countries or, more specifically, the world's least-developed countries. The emphasis here is on the latter since, in contrast to developing countries in general, their capacity to diversify exports in response to diminished demand and to cut back energy imports in response to higher oil prices is particularly limited.

The data displayed in Table 11 tell the story. Oil-importing developing countries have experienced large deficits on current account ever since the drastic increase in world oil prices in 1973-74. The financing of these deficits was made possible through substantial amounts of capital flows, predominantly bilateral finance in the form of private flows from DAC members (especially, overseas direct and bilateral portfolio investments) and international bank loans. The $ 8 billion increase in reserves fell to $ 2 billion in 1974, and oil-importing countries actually lost nearly $2 billion in reserves in 1975. The impact in 1974 was clearly related to the higher costs of oil imports, but the impact in 1975 largely resulted from the reduced volume of exports shipped to the recession-ridden industrialized world. The ensuing period, 1976-78, bear witness to renewed increases in reserves. For the least-developed countries, capital financing of deficits on current account mostly took the form of ODA bilateral and multilateral aid,

TABLE 11 : BALANCE OF PAYMENTS SUMMARIES FOR OIL-IMPORTING DEVELOPING COUNTRIES, 1973-78

I. Balance of Payments Summaries for Oil-Importing Countries, 1973-78. II. Balance of Payments Summaries for Least Developed Countries, 197

(in billions of $US)	1973	1974	1975	1976	1977	1978
1. Current Account Deficit	10.8	30.8	39.7	27.5	25.6	34.3
Deficit on goods, f.o.b.	5.6	2[illegible].9	30.5	17.9	[illegible].2	22.5
Deficit on Services, net	7.7	11.2	13.1	14.0	16.2	19.3
Less Private transfers	-2.5	-3.4	-3.9	-4.4	-5.8	-7.[illegible]
2. Long Term Financing	17.8	31.9	38.7	42.1	43.2	49.4
Bilateral finance of	14.6	27.9	33.3	36.6	36.6	42.0
which: ODA[a]	5.1	7.9	10.3	9.6	8.5	9.1
Other[b]	9.5	20.0	22.8	27.0	28.1	32.9
Multilateral finance of	2.4	3.4	4.6	4.8	6.1	6.8
which: ODA[a]	1.3	1.9	2.5	2.7	3.7	3.9
Other[c]	1.1	1.5	2.1	2.1	2.4	2.9
Socialist countries	0.9	0.7	0.6	0.6	0.6	0.6
3. Short term Financing	-0.8	0.7	-0.2	-4.8	-4.7	-2.0
4. Changes in Reserves[d] and Related Items	-7.8	-1.8	1.6	-9.8	-13.0	-13.1

(in billions of $US)	1973	1974	1975	1976	1977	1978
1. Current Account Deficit	1.2	2.5	3.3	1.6	1.8	3.7
Deficit on goods, f.o.b.	0.9	2.0	2.8	1.7	2.2	4.0
Deficit on services, net	0.6	0.9	1.1	1.0	1.2	1.5
Less private transfers	-0.3	-0.3	-0.5	-1.1	-1.6	-1.8
2. Long Term Financing	1.5	2.3	3.8	3.1	3.4	3.7
Bilateral finance of	1.0	1.5	2.5	2.0	2.2	2.3
which: ODA[a]	0.7	1.2	2.0	1.6	1.8	1.9
Other[b]	0.3	0.3	0.5	0.4	0.4	0.4
Multilateral finance of	0.4	0.7	1.1	1.0	1.1	1.2
which: ODA[a]	0.4	0.7	1.0	0.9	1.0	1.2
Other[c]	0.0	0.0	0.1	0.1	0.1	0.0
Socialist countries	0.1	0.1	0.2	0.1	0.1	0.1
3. Short Term Financing	-0.2	0.1	-0.4	-0.8	-0.6	-0.1
4. Changes in Reserves[d] and Related Items	-0.1	0.1	0.0	-0.7	-1.0	-0.1

a/ Official development assistance, including both OPEC and DAC member countries.

b/ Includes other official flows form OPEC and DAC member countries, private flows from DAC members, and other international bank lending.

c/ Includes other official flows form OPEC and DAC member countries.

d/ Negative (respectively, positive) amounts are construed as increases (respectively, decreases).

SOURCE: UNCTAD, Handbook of International Trade and Development Statistics, Supplement 1980.

reflective of their inability to borrow commercially. Reserves remained virtually unchanged through 1973-75, however comparatively large increases were recorded in 1976-77 corresponding to the improvement in their current account deficit. The large deficit in 1978 again reduced their reserves to nearly zero.

SECTION 3: LONG RUN IMPLICATIONS OF HIGHER ENERGY PRICES FOR DEVELOPING COUNTRIES.

3.1 Basic Assumptions

The most comprehensive and thorough assessment of the impact of higher energy prices in the 1980's on the growth of developing countries is that of the World Bank (15). For this reason, as a point of departure, the assumptions and projections of their global model will be employed here. Of the two alternative scenarios analysed by the World Bank, the assumptions and projections underlying their "high case" scenario have been selected. This scenario characterizes a much more successful adjustment to the oil price increase of 1979 in the world economy than does their "low case" scenario, with economic growth rates slowing less in 1980-85 and accelerating more in 1985-90. Two factors motivate this selection of scenarios. First, the 1980 "high case" scenario essentially corresponds to the World Bank's 1979 "base" case (vis-à-vís their "high" and "low" cases).[9/] Thus, it may tend to be less influenced by the obvious pessimism that surrounds the 1980 Report. Second, the "high case" scenario appears to be more credible in light of recent growth trends in the industrialized world. Fundamentally, the "low case" scenario is distinguished from the "high case" scenario in that it is much less optimistic about the rate of economic recovery in the early 1980's among industrialized nations. In the final analysis, however, the particular scenario chosen is a matter of preference and will, in any event, not detract from the conceptual exercise undertaken in the following subsection. The quantitative projections, however, may differ substantially.

Certain key assumptions on growth and trade in the world economy are set out in Table 12, and these are found to have some interesting implications. Developing countries are projected to increase their share in world manufacturing trade from 10 per cent in 1977 to 14 per cent by 1990 and in world fuel trade from 24 per cent in 1977 to 28 per cent by 1990. Their

---

9/ See World Bank (14).

TABLE 12. BASIC ASSUMPTIONS ON FUTURE TRADE AND GROWTH IN THE WORLD ECONOMY

	GNP (in 1977 Constant $US)				Real GNP Per Capita[a/]			Real Annual Average Growth Rates[a/]					
	Per Capita	Annual Average Growth Rates			Annual Average Growth Rates			Exports			Imports		
	1980	1970-80	1980-85	1985-90	1970-80	1980-85	1985-90	1970-80	1980-85	1985-90	1970-80	1980-85	1985-90
Industrialized	7,599	3.1	3.3	4.0	2.4	2.9	3.5	6.0	5.4	5.8	4.8	4.3	5.3
Developing	-	5.3	5.1	5.6	2.8	2.6	3.3	5.1	5.5	6.4	5.4	5.4	6.3
Oil Exporters	753	6.1	6.3	5.9	3.5	3.5	3.4	3.5	4.6	4.5	8.6	7.6	6.3
Oil Importers	-	5.1	4.7	5.5	2.7	2.4	3.2	5.6	5.7	6.8	4.6	4.7	6.3
Middle Income	1,275	5.5	4.9	5.7	3.1	2.6	3.5	5.9	6.1	7.0	5.2	4.9	6.5
Low Income	168	3.3	4.1	4.6	0.9	1.7	2.4	2.6	0.9	3.7	0.1	1	2.8

a/ In 1977 constant $US.

SOURCE: World Bank (15).

world shares in primary commodities and nonfactor services are predicted to change only slightly. Over the period 1977-90 merchandise exports are projected to grow at approximately a 6 per cent annual average rate within both industrialized and developed countries. Assuming that real energy prices grow at a 3 per cent annual average rate, oil-importing developing countries are predicted to increase their share of world oil imports from 23 to 27 per cent over the 1980's at the expense of the industrialized countries. Oil import costs will therefore rise from $ 58 billion in 1980 to $ 198 billion by 1990 for the oil-importing developing countries, with most of this sum (about 94 per cent) being borne by the middle-income group.

For the low-income oil-importing countries to achieve the real growth rates in Table 12,the gross domestic investment rate would have to rise from 21 per cent in 1980 to 25 per cent by 1990 and the gross domestic saving rate from 19 per cent in 1980 to 21 per cent by 1990. Whereas the middle-income group would need to maintain their gross domestic investment rate at 25 per cent, they would need to raise their gross domestic saving rate from 23 to 25 per cent over the same period. In real terms, current account deficits for the low-income countries are predicted to rise from $ 7 billion in 1980 to $ 12 billion in 1990 and, for the middle-income group, to fall from $ 36 billion in 1980 to $ 27 billion in 1990. By 1990 the current account deficit will be 4 per cent of the GNP in low-income countries but less than 2 per cent in the middle-income group. The $ 9 billion capital inflow required by low-income countries in 1980 is expected to rise to

$ 33 billion by 1990. In middle-income countries, financing requirements are expected to rise from $ 47 billion in 1980 to $ 95 billion by 1990. Outstanding total debt will have nearly quadrupled for both income groups over the 1980 levels, from $ 46 billion to $ 182 billion in the low-income countries and from $ 242 billion to $ 774 billion in the middle-income countries.

3.2 Capital Requirements

Reliable estimates of capital requirements in the 1980's for the oil-importing developing countries are not possible. The projected distribution of output for 1990, taken from World Bank (14), appears in Table 13. The 1978 distribution, published in World Bank (15), is used as a proxy for 1980, and the 1985 distribution had to be interpolated. These sets of distribution figures, together with the World Bank's projections for real output, enable the determination of the distribution of increases in real output by major product sector: agriculture, industry (inclusive of manufacturing), manufacturing, and services. Ratios of capital (plant and equipment plus inventories) to output are taken from Stern (12) for the $ 200 (low income) and $ 1550 (middle income) per capita GNP levels. The total ratios differ from the direct ratios in that the former include both direct and the indirect capital requirements (or capital "multiplier" effects) associated with the activity. Unfortunately, his sectoral classification is relatively disaggregated (30 sectors) and is not directly applicable. Particular sectors, considered to be indicative of their more highly aggregated counterparts, were chosen as a compromise solution to the problem (see note d to Table 13). The resulting direct and total investment figures are, therefore, highly tentative and possibly misleading.

A summary of the results is as follows. In order to achieve the additional $ 233 billion in real output by 1985, middle-income oil importers will need $ 266 billion in direct capital and over $ 450 billion in total capital. The additional $ 580 billion in real output by 1990 will call for $ 682 billion in direct capital and over $ 1,157 billion in total capital. The overwhelming bulk of these capital requirements are in the industrial (especially, manufacturing) and service sectors of the economy. For the

low-income oil importers, the additional $ 45 billion in real output by 1985 will necessitate an additional $ 52 billion in direct capital and over $ 90 billion in total capital. The extra $ 106 billion in real output by 1990 calls for an additional $ 123 billion in direct capital and over $ 213 billion in total capital. Again, much of the needed capital resides in the industrial and service sectors, however over 10 per cent of the capital requirements must be allocated to the agricultural sector. The mechanisms and bottlenecks involved in financing these capital requirements are discussed in World Bank (15).

3.3 Policy Issues and Recommendations

Higher energy prices in the 1980's may tend to impede growth and industrialization in the nonoil developing countries through both direct and indirect means. By raising their energy import bill and, hence, reducing their capacity to import capital goods and raw materials needed to support an expansion in industrialization, higher energy prices exert a direct negative impact on growth in the nonoil developing countries. Correspondingly, by retarding growth rates and stimulating inflation in the developed countries, higher energy prices tend to register an indirect negative impact on the nonoil developing countries via reductions in the demand for their exports and in the flow of concessional and nonconcessional assistance from the developed countries. There are several steps that can be taken to mitigate these negative impacts and, thus, to enhance the growth prospects for the nonoil developing countries in the 1980's.

First, the nonoil developing countries should strive to increase their exports and domestic investment in the 1980's. Whereas continued emphasis on import-substitution strategies (e.g. curbing nonessential imports, shifting production toward less import-intensive commodities, and replacing more imports by domestic production) may be advisable for the near term, during which the slowdown in world trade precipitated by the recent round of oil price increases adjusts to large transfers of reserves to the oil-exporting countries (viz. OPEC) and to the induced changes in commodity terms of trade, policies designed to promote exports (less reliance on quotas and administrative controls, tariff reduction, etc.) are clearly preferable for most of the decade. Inward-looking

TABLE 13: DIRECT AND TOTAL CAPITAL REQUIREMENTS IN THE OIL-IMPORTING DEVELOPING COUNTRIES

	Distribution of Output (%)														
	Agriculture			Industry			Manufacturing[a]			Services			Real Output[b]		
Country Group	1980	1985	1990	1980	1985	1990	1980	1985	1990	1980	1985	1990	1980	1985	1990
Middle Income	16	13	10	34	37	41	25	27	30	50	50	49	903	1,135	1,483
Low Income	38	34	30	24	26	28	13	14	15	38	40	42	197	242	303

	Capital-Output Ratios				Increase in Real Output[c]				Direct Investment[c]				Total Investment[c]			
	Middle Income		Low Income		Middle Income		Low Income		Middle Income		Low Income		Middle Income		Low Income	
Sector Group[d]	Direct	Total	Direct	Total	1985	1990	1985	1990	1985	1990	1985	1990	1985	1990	1985	1990
Agriculture	1.20	1.85	0.83	1.69	3	4	7	16	3.6	4.8	5.8	13.3	5.6	7.4	11.8	27.0
Industry	0.93	1.65	1.22	2.02	113	301	16	38	105.1	279.9	19.5	46.4	186.5	496.7	32.3	76.8
Manufacturing	0.86	1.35	1.05	1.78	80	219	8	19	68.8	188.3	8.4	20.0	108.0	295.7	14.2	33.8
Services	0.76	1.30	0.84	1.46	116	275	22	52	88.2	209.0	18.5	43.7	150.8	357.5	32.1	75.9

a/ Manufacturing is part of the industrial sector.

b/ GNP in 1977 constant $US. Data are in $ billions.

c/ In $ billions over the corresponding figures for 1980.

d/ The sectoral grouping corresponds to the former ISIC definitions as follows: agriculture, other than livestock, oil crops, grains, and roots; industry (293-95, 299); manufacturing (37); services (852-54).

SOURCES: World Bank (14), (15) and Stern (12), Tables 7a and 7b.

policies, after all, not only stifle intra-group trade within the developing countries but also prevent the orderly expansion in trade opportunities made possible by the anticipated recovery of developed economies in the mid-1980's. Similarly, increases in domestic savings and investment rates within the oil-importing developing countries, as well as improvements in the productivity of existing and new investments, can contribute substantially to their adjustment and growth throughout the decade. The spectacular growth performance of Brazil and South Korea, for example, during the difficult adjustment period of 1974-78 following the first major oil price increase, is ample testimony to the importance of maintaining high levels of productive investment.

Second, whereas the growth prospects for the oil-exporting developing countries are quite impressive, a balanced investment of their oil revenues in both the nonoil and oil sectors is imperative for the early 1980's. This will enhance their creditworthiness and facilitate their efforts to borrow commercially in order to sustain their growth in the late 1980's.[10] The role

10/ Although less than 25 per cent of the $ 75 billion borrowed medium- and long-term by developing countries in 1980 went to oil exporters, by 1990 more than 28 per cent of the estimated $ 178 billion borrowed by developing countries will go to the oil-exporting countries. See World Bank (15).

of the capital-surplus oil exporters (Iran, Iraq, Kuwait, Libya and Saudi Arabia) is, of course, essentially unique. The achievement of projected growth rates in the world economy depends directly on their willingness to avoid large oil price increases and oil supply interruptions, and indirectly on their willingness to recycle oil earnings by means of increased holdings of foreign assets, expanded purchases of exports, and additional financial support to the developing countries. Moreover, even if such willingness prevails, there are those (18) who believe that the capacity of the international capital markets to recycle oil surpluses is inadequate to the task ahead. Accordingly, a greater burden must be assumed by official agencies in helping to achieve the financing requirements of the developing countries, especially the low-income oil importers.

Finally, the industrialized countries can assist the nonoil developing countries in basically three ways. First, as the major market for exports from the developing countries, the industrialized countries should avoid excesses in deflationary monetary and fiscal policies and, at the same time, should strive to liberalize trade by avoiding the use of exchange-rate depreciation, export subsidies, and import protectionism. Second, as the major source of finance for the developing countries, the industrialized countries should reverse the tendency for their aid to fall as a percentage of GNP and encourage the expansion in lending from their commercial capital markets. Third, as the major consumer of the world's energy (viz. oil), the industrialized countries should continue to adopt pricing and conservation policies that reduce their energy-GNP ratios and to expand expenditures on exploration and exploitation of conventional fossil fuels and on the development of feasible, nonconventional energy sources. Taken together, these policies ought to improve the export earnings of the nonoil developing countries, reduce their energy import costs, and provide the necessary deficit financing to tide them over the adjustment period of 1980-85. Whether the industrialized countries are willing to incur and maintain larger deficits as a result of these policies is uncertain, but the growth prospects for the nonoil developing countries over the longer term of 1985-90 would certainly seem to be less bright otherwise.

REFERENCES

1. Belassa, B. "The Newly-Industrializing Developing Countries after the Oil Crisis", World Bank Staff Working Paper No. 437, October 1980.

2. Dunkerley, J. "Adjustment to Higher Oil Prices in Oil-Importing Developing Countries", Journal of Energy and Development, Vol. 5, No. 2, Spring 1980.

3. Energy: Global Prospects 1985-2000, Report of the Workshop on Alternative Energy Strategies, McGraw-Hill, New York, 1977.

4. Fallen-Bailey, D.G. and T.A. Byer "Energy Options and Policy Issues in Developing Countries", World Bank Staff Working Paper No. 350, August 1979.

5. Fried, E.R. and C.L. Schultze, eds. Higher Oil Prices and the World Economy, Brookings, Washington, D.C., 1975.

6. Griffin, J.M. "Inter-Fuel Substitution Possibilities: A Translog Application to Intercountry Data", International Economic Review, Vol. 18, No. 3, October 1977.

7. Holsen, J.A. "Growth Prospects for the Non-Oil Middle-Income Countries, 1977-85", Finance and Development, Vol. 14, No. 2, June 1977.

8. IMF. Annual Survey, Washington, D.C., 1980.

9. Lambertini, A. "World Energy Prospects and the Developing World", Finance and Development, Vol. 16, No. 4, December 1979.

10. OECD, Economic Outlook, Paris, December 1980.

11. Powelson, J.R. "The Oil Price Increase: Impacts on Industrialized and Less-Developed Countries", Journal of Energy and Development, Vol. 3, No. 1, Autumn 1977.

12. Stern, J.J. "The Employment Impact of Industrial Investment", World Bank Staff Working Paper No. 255, June 1977.

13. Tims, W. "The Developing Countries", in E.R. Fried and C.L. Schultze, eds., Higher Oil Prices and the World Economy.

14. World Bank, World Development Report, 1979. Washington, D.C., August, 1979.

15. World Bank, World Development Report, 1980, Washington, D.C., August 1980.

16. World Bank, "Energy in the Developing Countries", World Bank, August 1980.

17. IIASA, Energy in a Finite World, Vol. II, Ballinger, Cambridge, 1981.

18. IMF. "Prospects for Recycling Oil Surpluses by the International Capital Markets," Finance and Development, Vol. 18, No.1, March 1981.

APPENDIX TABLE 1: SOCIO-ECONOMIC INDICATORS FOR THE LDC'S

COUNTRY	POPULATION Mid-1978 (in m)	POPULATION Average Annual Growth Rate (%) 1970-78	AREA (in the. km²)	GDP PER CAPITA (in current $US) 1978	GDP PER CAPITA Average Annual Real Growth (%) (in 1970 $US) 1960-70	GDP PER CAPITA Average Annual Real Growth (%) (in 1970 $US) 1970-79	DISTRIBUTION OF GDP(%) Agriculture 1960	DISTRIBUTION OF GDP(%) Agriculture 1978	DISTRIBUTION OF GDP(%) Industry 1960	DISTRIBUTION OF GDP(%) Industry 1978	DISTRIBUTION OF LABOR(%) Agriculture 1960	DISTRIBUTION OF LABOR(%) Agriculture 1978	DISTRIBUTION OF LABOR(%) Industry 1960	DISTRIBUTION OF LABOR(%) Industry 1978
Afghanistan [f]	14.6	2.2	647	240	0.2	2.0	57	49	10	25	85	79	6	9
Bangladesh	84.7	2.7	144	90	0.8	2.8	61	57	8	13	87	74	3	11
Benin	3.3	2.8	113	230	1.3	0.3	55	31	8	13	54	46	9	15
Bhutan	1.2	2.1	47	100	-	-	-	-	-	-	95	93	2	2
Botswana [f]	0.8	3.0 [a]	600	230	3.7	3.1	-	24	-	31	-	-	-	-
Burundi [g]	4.5	2.0	28	140	-4.9	1.2	76	47	8	24	90	85	3	5
Cape Verde [g]	0.3	1.9 [a]	4	150	-1.7	-2.0	13	35	1	7	-	-	-	-
Cent. African Rep.	1.9	2.2	623	250	-0.5	-0.4	51	36	10	18	94	89	2	3
Chad	4.3	2.2	1.284	140	-1.7	0.5	55	52	12	13	95	86	2	6
Comoros [g]	0.4	4.6 [a]	2	180	3.7	-3.2	64	47	7	23	-	-	-	-
Ethiopia	31.0	2.5	1.222	120	1.9	-0.2	65	54	12	13	88	81	5	7
Gambia [g]	0.6	2.6 [a]	11	230	0.5	-0.5	58	59	2	5	-	-	-	-
Guinea	5.1	2.9	246	210	-0.8	0.2	56	32	36	41	88	82	6	11
Haiti [f]	4.8	1.7	28	260	-1.2	1.7	49	41	14	19	80	70	6	8
Laos	3.1	1.3	237	90	2.1	-2.6	-	60	-	14	83	75	4	7
Lesotho	1.3	2.3	30	280	2.0	0.5	-	36	-	15	93	87	2	4
Malawi	5.7	2.9	118	180	1.9	3.6	58	43	11	19	92	86	3	5
Maldives	0.1	3.8 [a]	0,3	150	-	-	-	-	-	-	-	-	-	-
Mali	6.3	2.5	1.240	120	-2.1	-0.2	55	37	10	18	94	88	3	6
Nepal	13.6	2.2	141	120	0.2	0.3	-	62	-	12	95	93	2	2
Niger	5.0	2.8	1.267	220	1.8	1.8	69	43	9	17	95	91	1	3
Rwanda	4.5	2.9	26	180	2.0	3.0	81	46	7	22	95	91	1	3
Samoa [f]	0.2	1.0 [a]	3	455 [b]	-	-	-	49	-	7	-	61 [c]	-	8 [c]
Somalia	3.7	2.3	638	130	-0.6	1.1	67	60	13	11	88	82	4	7
Sudan	17.4	2.6	2.506	320	0.2	0.5	58	43	15	12	86	79	6	9
Tanzania	16.9	3.0	945	230	5.0	1.9	57	51	11	13	89	83	4	6
Uganda	12.4	2.9	236	280	1.5	-3.2	52	57	13	7	89	83	4	6
Upper Volta	5.6	1.6	274	160	2.7	-1.0	62	38	14	20	92	83	5	12
Yemen	5.6	1.9	195	520	2.3	3.4	-	35	-	14	83	76	7	11
Yemen DR [f]	1.8	1.9	333	420	-4.9	2.5	-	19	-	28	70	60	15	21

SOURCE: World Development Report, 1980, unless otherwise noted.

NOTES: a/ Average annual population growth rate for the period 1970-77. Source: United Nations, Statistical Yearbook, 1978.

b/ Samoa's nominal GDP per capita for the year 1977. Source: UNCTAD, Handbook of International Trade and Development Statistics, Supplement 1980.

c/ Source: UNCTAD, Handbook of International Trade and Development Statistics, Supplement 1980.

d/ The agricultural sector comprises agriculture, forestry, hunting and fishing. The industrial sector comprises mining, manufacturing, construction, and electricity, water and gas. All other branches of economic activity are ordinarily categorized as services, which is a residual item in this table.

e/ Data for Burundi, Cape Verde, Comoros and Gambia on the distribution of GDP are from UNCTAD, Handbook of International Trade and Development Statistics, 1979. The latest year available is 1977.

f/ Data on the distribution of GDP are from United Nations, Statistical Yearbook, 1978, for the latest year available: Afghanistan (1977), Botswana (1976), Haiti (1976), Samoa (1972), Yemen DR (1970).

g/ Samoa's labor force distribution for the year 1976. Source: ILO, Yearbook of Labor Statistics, 1980.

APPENDIX TABLE 2: PRODUCTION AND CONSUMPTION OF COMMERCIAL ENERGY IN THE LDC'S

PRIMARY COMMERCIAL ENERGY

		Production				Consumption			Electricity		
COUNTRY	YEAR	TOTAL[a]	%COAL	%GAS	%HYDRO	TOTAL[a]	PER HEAD[b]	PROD/CONS[c]	[illegible][d]	[illegible]	CONSUMPTION PER HEAD
Afghanistan	1960	62	77		23	208	15	30	119	5	9
	1970	3,443	5	94	1	690	46	499	396	4	27
	1979	3,335	7	90	3	1,203	76	277	880	26	57
Bangladesh	1972	636		94	6	1,729	24	37	1,235	76	17
	1979	1,301		94	6	3,276	38	40	2,355	74	27
Benin	1960	0				82	39	0	10	100	5
	1970	0				136	50	0	33	100	12
	1979	0				199	57	0	5	100	25
Botswana	1970	-				-			30	100	-
	1979	-				-			420	100	-
Burundi	1962	0				30	10	0	0	100	5
	1973	3	100			33	9	9	1	100	6
	1979	10	100			58	13	17	1	100	8
Cape Verde	1960	0				9	45	0	1	100	5
	1970	0				13	49	0	7	100	26
	1979	0				48	150	0	9	100	28
Central African Republic	1960	1			100	47	37	1	8	0	6
	1970	5			100	102	57	5	47	6	26
	1979	7			100	88	41	7	62	6	29
Chad	1960	0				35	12	0	8	100	3
	1970	0				60	16	0	42	100	12
	1979	0				97	22	0	63	100	14
Comoros	1962	0				5	22	0	1	100	5
	1970	0				12	44	0	2	100	7
	1979	0				19	58	0	4	100	12
Ethiopia	1960	6			100	173	8	3	102	55	5
	1970	32			100	675	27	5	502	50	21
	1979	48			100	501	16	10	720	46	24
Gambia	1960	0				9	24	0	5	100	13
	1970	0				22	48	0	13	100	28
	1979	0				69	118	0	35	100	60
Guinea	1961	1			100	308	97	0	134	93	42
	1970	3			100	361	92	1	388	94	99
	1979	10			100	414	85	2	495	84	101
Haiti	1960	0				132	36	0	90	100	25
	1972	9			100	178	41	5	118	47	28
	1979	26			100	256	52	10	280	23	57
Laos	1960	0				41	18	0	13	100	6
	1971	1			100	204	42	0	16	38	29
	1979	71			100	239	52	30	600	4	102
Malawi	1964	1			100	139	37	1	57	82	15
	1970	16			100	184	41	9	145	10	32
	1979	71			100	317	54	22	340	10	58
Maldives	1970	-				-			1	100	9
	1979	-				-			3	100	21
Mali	1960	0				53	15	0	15	100	4
	1970	3			100	100	20	3	57	51	11
	1979	6			100	179	28	4	100	55	15
Nepal	1960	1			100	42	5	2	11	36	1
	1970	7			100	155	14	5	76	29	7
	1979	18			100	144	11	13	195	26	15
Niger	1960	0				16	5	0	3	100	3
	1970	0				97	24	0	33	100	10
	1979	0				227	44	0	46	100	18
Rwanda	1962	1			100	43	15	2	10	0	3
	1970	11		9	91	39	11	28	31	1	21
	1979	21		5	95	95	20	22	160	2	39

Samoa	1962	1		100	11	87	9	6	17	51
	1970	1		100	16	113	6	11	45	77
	1979	1		100	39	250	3	30	77	192
Somalia	1960	0			42	19	0	11	100	5
	1970	0			103	37	0	28	100	10
	1979	0			284	80	0	72	100	20
Sudan	1963	3		100	759	59	0	163	85	13
	1970	12		100	2,088	148	1	392	74	28
	1979	61		100	2,279	128	3	900	44	50
Tanzania	1960	14	14	86	423	-	3	166	43	-
	1970	41	7	93	762	57	5	479	36	36
	1979	67	3	97	778	43	9	700	25	39
Uganda	1960	49		100	224	30	22	420	57	34
	1970	94		100	694	71	14	778	2	54
	1979	79		100	362	27	22	650	2	34
Upper Volta	1960	0			24	5	0	8	100	2
	1970	0			69	13	0	27	100	5
	1979	0			156	23	0	90	100	13
Yemen	1961	0			38	8	0	7	100	2
	1970	0			81	17	0	18	100	4
	1979	0			396	68	0	72	100	12
Yemen DR	1960	0			296	299	0	144	100	146
	1970	0			388	270	0	192	100	134
	1979	0			956	520	0	245	100	133

a/ in thousand metric tons of coal equivalent

b/ kilograms of coal equivalent per capita

c/ ratio of production to consumption of primary commercial energy, expressed as a percentage

d/ in million kilowatt hours

e/ kilowatt hours per capita

SOURCE: United Nations, World Energy Supplies 1950-1974, and 1979 Yearbook of World Energy Statistics, various tables.

NOTES:

1) Data unavailable for Bhutan and Lesotho.
2) Symbol "-" means "data unavailable".
3) Symbol "0" means "less than 0.5 of the unit specified".
4) Data by country are given for the year 60, given data availability; otherwise, the year in which data are available (e.g. 1962 for Burundi) is substituted.
5) Data for Tanganyka and Zanzibar are used for Tanzania in 1960.

APPENDIX TABLE 3: FOSSIL FUEL, NUCLEAR AND HYDRAULIC RESOURCES IN THE LDC'S

Oil and Gas Resources (as of 1979)

COUNTRY	PROVEN RESERVES[a/]	PRODUCTION[b/]	RESERVES/PRODUCTION
Afghanistan	-	3.0	-
Bangladesh	337.2[e/]	1.2	281
Rwanda	-	0	-

Coal Resources (as of 1977)

COUNTRY	RESOURCES[a/]	RESERVES[a/]	PRODUCTION[b/]	RESERVES/PRODUCTION
Afghanistan	85	-	250	-
Bangladesh	1,614	591	0	-
Botswana	100,000	3,500	330	10,600
Burundi	-	-	TO	-
Haiti	7	-	0	-
Malawi	14	-	0	-
Tanzania	360	-	2	-

Uranium Resources (as of 1979)

COUNTRY	RESOURCES[c/]	RESERVES[c/]	PRODUCTION[c/]	RESERVES/PRODUCTION
Cent. African Republic	18	18	0	
Niger	213	160	2.3	70

SOURCES: Production data and data on uranium resources andy hudroelectric power are from the 1979 Yearbook of World Energy Statistics, United Nations. Data on fossil fuel resources and reserves are from World Bank (16).

Hydroelectric Power Capacity (as of 1977)

COUNTRY	TOTAL[d/]	OPERATING	UNDER CONSTRUCTION	PLANNED
Afghanistan	245	245	0	0
Bangladesh	756	80	50	100
Cent. African Republic	46	16	-	-
Ethiopia	468	206	0	262
Guinea	50	50	-	-
Haiti	47	47	-	-
Laos	47	47	-	-
Malawi	667	57	90	510
Mali	6	6	-	-
Nepal	36	36	-	-
Rwanda	165	34	0	128
Samoa	1	1	0	0
Sudan	110	110	0	0
Tanzania	188	188	-	-
Uganda	156	156	-	-

a/ in million metric tons of coal equivalent
b/ in thousand metric tons of coal equivalent
c/ in metric tons
d/ in thousand kilowatts
e/ 4.9 as oil and 332.3 as nonassociated gas

NOTES:
1) Symbol "-" means "data unavailable".
2) Symbol "0" means "less than 0.5 of the unit specified".