



SEAS

DISCUSSION PAPER NO. 74

JAPAN: THE RISING SUN OR THE SINKING SHIP

-- the Energy Problem and
the Food Shortage --

by

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July, 1974

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Kyoto, Japan

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Quotations are not permitted without the
written permit from the author.

Introduction

Two recent bestsellers in Japan have predicted glory, on the one hand, and doom on the other. Herman Kahn's Emerging Japanese Superstate, Challenge and Response was at the top of the lists in 1971, to be followed a year or so later by the Japanese novel *Nihon Chinbotsu* (The Submerging of Japan) by Sakyō Komatsu. Many Japanese believed Kahn's flattering but facile prediction that the "21st century will be Japan's century." Now, however, even more well-informed people are expressing rather serious concern that the nation is going under, if not literally sinking into, the sea. During the last few years, the subject of Japan's future has precipitated intense, sometimes radically polarized feeling. Former exultation over miraculous growth rates is seldom seen, as a dour pessimism about an economic future devoid of natural resources, has crept in. Increasing numbers of specialists are trying to draw attention to the vulnerable structure of the economy almost totally dependent on the natural resources of foreign nations. The same people believe that the rate of economic growth should be slowed down to 4 or 5 percent annually in the next five or six years.

Prospects for the Japanese economy are, however, only one facet of the dramatic shift in current thinking. The whole international economic outlook has undergone drastic change since 1973.

One important factor in bringing about this change is the energy crisis, another is the worldwide shortage of agricultural

products. Previous to their occurrence, we had known that both crises were possible. For example, US president Richard M. Nixon spoke of the threat of an energy crisis in the 1980s in his "Energy Message." The Food and Agricultural Organization (FAO) and other international agencies were optimistic enough to extrapolate a temporary and partial success for the "Green Revolution," projecting its continuance into the future. But their optimism did not last too long. The increase in the prices of oil and wheat are almost unbelievable. From US \$2.18 per barrel at the time of the Teheran Agreement in February 1972, it has soared to \$11.65 a barrel today, an increase of 5.3 times. One bushel of wheat (27.2 kg.) was \$4.50, a 450 percent increase. These rampaging price hikes are partly the result of short-term disruptions so that they will probably level off somewhat in the near future. But they serve as a serious warning to us now: the long-range supply and demand balance has collapsed, threatening the entire world with critical energy and food shortages.

Just as frightening are the political ramifications. We have already seen the economic impact of the startling price increases in oil and wheat--economic upsets on such a scale could lead to serious international political problems. It will be difficult to avoid some kind of world commotion unless the entire framework and mechanism of the world economy and politics are systematically re-evaluated.

There is much ground to cover, but I would like to consider the set of circumstances surrounding the two resource crises, and comment briefly on the effects that they could have, both political and economic, on Japan the the whole world.

1. Supply and Demand of Energy Resources

At present, oil is the center of attention, but the real problem is far bigger--it is the inadequate and dwindling supply of all mineral and energy resources. The problem is clear enough to make unnecessary any quotations from the Club of Rome report, Limits of Growth, but the upshot of that report was that some mineral resources will be depleted in around thirty years. In terms of the ratio of known reserves to the annual volume of production, iron and aluminum are high on the scale, with 500 and 200 respectively. Copper, however, is only 53, and lead, manganese, tin and zinc are also very low, threatening a crises in supply of these metals within a few decades. The discovery of new mineral deposits, use of low quality metals or substitutes and recycling will put off the day of complete depletion, but such measures will only prolong the certain demise of one metal after another. We face a lack of minerals in the near future that will be as severe, or possibly even worse than the recent energy crisis. The crisis may be only a hint of what is to come.

If the total volume of energy sources is calculated, there is no fear of exhaustion. Total reserves of coal, natural gas

and oil, and we have also access to atomic and solar energy, ocean currents and hydrogen as power sources. However, our dependence on oil in the next several decades is going to continue and will reach overwhelmingly high rates. The annual ratio of oil reserves to annually produced oil has maintained a consistent 30 since my childhood, so it is difficult to believe that oil will be really exhausted in 30 years. However, geologists such as Hendricks, Weeks and Hopper say that the maximum possible volume of extractable oil will be between 1,500,000 and 2,500,000 million barrels. This volume is only four times the present known reserves of 669,000 barrels. If we consider that as the ultimate limit of extractable oil, and if oil consumption increases at 7-8 percent annually, and if we calculate on the basis of the 18,200 million barrels produced in 1972, then our oil supply will dry up in 30 years. (See Chart 1)

If, in ter interim, we do not succeed in developing techniques for economically feasible production of energy resources to replace oil, then the annual rate of increase in oil consumption must be cut down to less than 7 percent. If we are to postpone the exhaustion of oil to 45 years hence, it would have to fall to 4 percent, or 3 percent if we desire a 60-year reprieve. Even using Week's theory of second-ary recovery, and estimating the limit of oil reserves at 3,700,000 million barrels, the day the wells run dry will be 35 instead of 30 years away--that's all.

A great many studies have been published on the possibility of developing energy sources such as atomic energy, coal oil

Chart 1.

Oil Reserves and Oil Production (Major producing countries)

	Known Oil Reserves (Major countries)			Oil Production (1972)		
	1 mil. bbl	1 mil. tons	Proportion of World Reserves	1,000 bbl./day	1 mil. tons/yr	Proportion of World Production
Abu Dhabi	20,800	2,800	3.1 %	1,000	50	2.0%
Iran	65,000	8,900	9.7	4,900	244	10.0
Iraq	29,000	4,000	4.3	1,500	75	3.0
Qatar	7,000	1,000	1.0	450	22	0.9
Kuwait	64,900	8,900	9.7	2,750	137	5.5
Saudi Arabia	138,000	18,900	20.7	5,260	262	10.6
Indonesia	10,000	1,400	1.5	1,030	51	2.1
Nigeria	15,000	2,100	2.2	1,800	90	3.6
Algeria	47,000	6,400	7.0	1,060	53	2.1
Libya	30,400	4,200	4.6	2,230	111	4.5
Venezuela	13,700	1,900	2.1	3,200	160	6.4
OPEC Total	440,800	60,500	66.1	25,180	1,255	50.7
Communist nations	98,000	13,400	14.7	8,910	444	17.9
Soviet Union	75,000	10,300	11.2	7,880	392	15.9
China	19,500	2,700	2.9	590	29	1.2
9/- United States	36,800	5,000	5.5	9,500	473	19.1
Others	128,100	17,500	19.2	15,610	777	31.4
World Total	666,900	91,400	100.0	49,700	2,476	100.0

Source: Oil & Gas Journal

shale and tar sand. It seems clear, in view of the new oil prices, that most of them need to be carefully examined again. One example is the 1971 U.N. report, "World Energy Demand in the Year 2000." And another is the report put out by Exxon in April 1973 which purports to show the different costs of energy in 1985.

Chart 2 Energy Costs in 1985

	North America	Japan
Middle East Crude (C.I.F)	7-8	6-7
Tar Sand	6-8	7-9
Coal Synthetic, Shale Oil	8-10	9-11
Coal (direct use)	4-6	5-7

Notes:

1. Figures include normal profits of 15%
2. Dollar/barrel, conversion into low sulfur crude, value of the dollar in 1985; oil costs assume a 7% annual increase with 1972 as the base year, which now is clearly invalid.

Source: Based on Exxon estimates given in Sekai no enerugii kiki to Nihon no senryaku (The World Energy Crisis and Japan's Strategy) ed. by Kondo, Sakisaka, and Saeki, 1974, Diamond-sha, p.161.

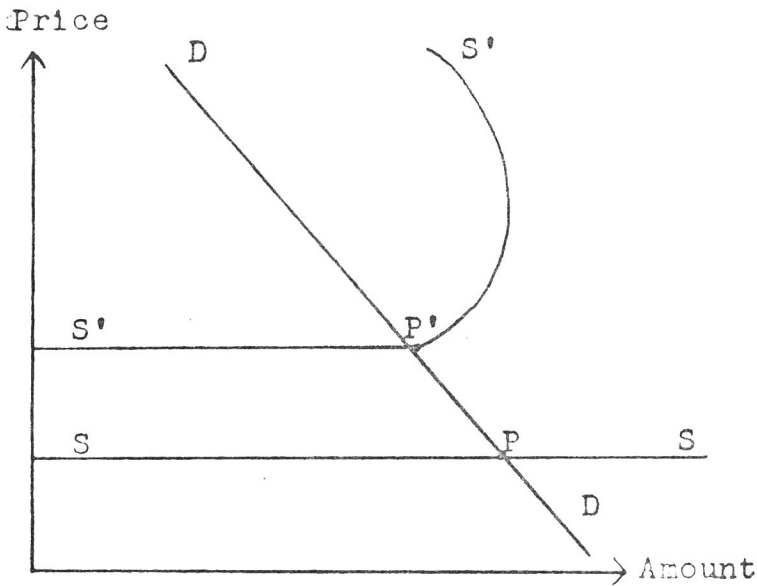
On the basis of these calculations, particularly when the present price for Middle East crude oil is US \$11.00 a barrel,

a strong economic impetus emerges to develop energy substitutes for oil. The development of atomic energy for electrical power use, previously calculated to supply 60 percent of power in the year 2000, will be pushed ahead that much faster. The beginning of competition between oil and synthetic fuels in the energy market will probably occur in the latter part of the 1980s. The trend will be toward faster development of alternative energy sources, which, as a result, will help restrain the increase in oil prices. Increase in oil production will probably not slow down that much, and oil consumption will continue to grow at a rate slightly higher than 3-4 percent per year.

This can be demonstrated in the style of an economics textbook, as in Chart 3. Point P in (A) is where previous demand curve DD and previous supply curve SS intersect. At this point production and cost are in balance. The shift of the Middle East supply to S'S' creates a new equilibrium at P' showing a rise in prices and a decline in consumption. (B) adds the supply of synthetic fuel to the situation so that even if demand curve D'D' increases, the equilibrium price will fall to P₃, a point lower than P₁ where only oil is available, and also lower than P₂ where only synthetic fuels are supplied. If we consider that the shape of the supply curve is determined by the cost curve, which reflects the production process of various synthetic fuels, it is not too difficult to forecast the trends in oil prices.

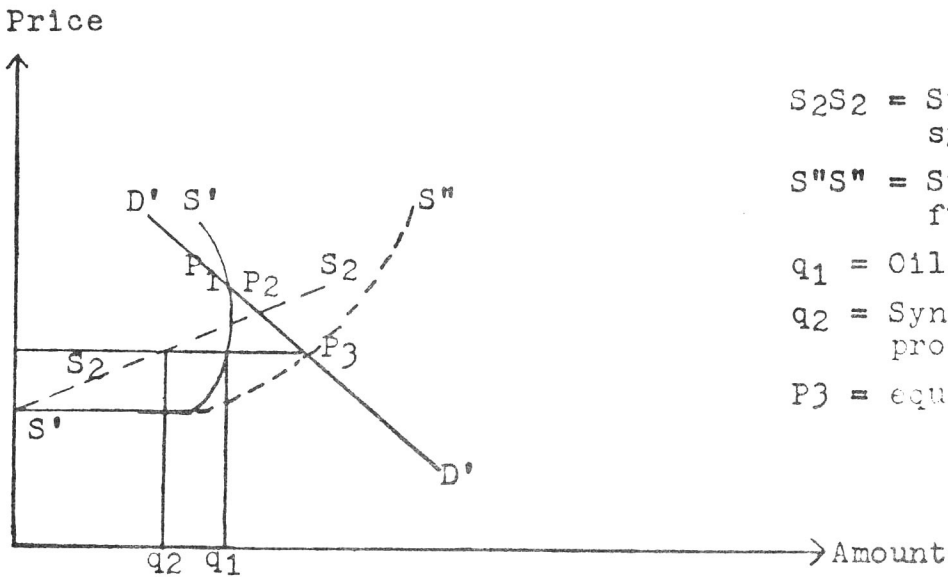
Char 3. Oil Price and the Effect of Synthetic Fuels

(A)



DD = Demand curve
 SS = Previous supply curve
 S'S' = Supply curve after oil crisis
 P = Previous point of equilibrium
 P' = Point of equilibrium

(B)



S₂S₂ = Supply curve of synthetic fuel
 S''S'' = Supply curve of fuel
 q₁ = Oil production
 q₂ = Synthetic fuel production
 P₃ = equilibrium price

2. Uneven Distribution of Resources

The resource situation is made more complex by the fact that energy and mineral resources are unevenly distributed throughout the world. Four advanced nations, the United States, Canada, the Soviet Union and Australia, have particularly large domestic sources of energy. These are the "have" countries of resources; the others, with a few exceptions, are the "have-nots." The exceptions are the Middle East nations with oil; Central and South America with bauxite, copper and nickel; Zaire with copper; India with iron ore; and China with coal. As chart 1 shows, the countries of OPEC have 66 percent of the world's known oil reserves, but Canada and the United States have a preponderance of resources other than oil. These two countries have 8.6 percent of the world's oil, 18 percent of the coal, 19 percent of natural gas, 53 percent of oil-bearing shale, 78 percent of tar sand, 10-20 percent of the iron ore, 32 percent of copper, and 13 percent of the nickel reserves. Both nations put together represent only about 6 percent of the world's population. Obviously, Canada and the United States are blessed with natural resources.

On top of the uneven distribution of resources, there has arisen an imbalance in supply and demand, which naturally has driven prices upward. This situation has placed the "have" countries in an even more advantageous position vis-à-vis the "have-not," who have been pushed to the opposite end of the scale. The emergence of the natural resources problem has brought to the

surface a division in both the advanced and developing groups of nations, between advanced nations with and without resources, as well as between developing countries with and without resources. The United States, Australia, Canada and the Soviet Union are all four industrialized countries which benefit from their possession of abundant resources; the industrialized nations of Eastern and Western Europe and Japan are "have-nots" with a decided disadvantage. On the non-industrialized, developing side, the Middle and Near Eastern countries, as well as Indonesia and Venezuela, are actually "have" countries in resources, with the rest of the developing nations seemingly made to suffer all the more. This last group, then, could be redefined--they move from the category of Third World developing nations to that of a "Fourth World," that of the "Least Developed Developing Countries" (LDDC). In the 1960s, the per capita income of sixteen countries, including Ghana, Jordan, Senegal and Sudan, was falling. There are twenty-five countries which can be classified in the LDDC group, which even today have an annual per capita income of less than US \$100.

In addition to the previous divisions of East and West, North and South, we now have a four-level division of countries. The countries in the first group including those with planned economies (the Soviet Union) and those of the free world (the United States and Canada) now have common interests with the third group (the Middle Eastern and other oil producing countries.)

The second free world group, Western Europe and Japan, and the second planned economy group, Eastern Europe, however, become part of an alliance of weak men with the fourth group, but seem to have no common point of interest. Rather, since they are advanced industrial nations with superiority in technology and science, they must strengthen their cooperative relations with the oil producers. These nations must cooperate with the United States, on the one hand, and with the oil producers of the third group on the other, using their industrial capacity as bargaining power. Such a policy may appear to be contradictory from a short-run perspective, but not in the long run. As stated earlier, the long-run view of the resource problem places North America in a very firm position. If Western Europe and Japan can truly appreciate that fact, they will probably not risk the national security by adopting foolish policies which would impair smooth relations with North America. It will be even more important to maintain good relations if the United States pushed the development of alternative energy resources and moves quickly toward the policy described in the Nixon energy message.

At the same time, the West European countries and Japan will probably put a great deal of effort into cultivating good relations with the third-group countries from now on, as will be explained later in this paper.

The most pitiful aspect of the situation is that the non-oil producing underdeveloped nations are being increasingly isolated.

The advanced and oil producing nations, regardless of divisions between East and West, must cooperate in assistance programs to develop the nations of the fourth group. It is desirable that the Soviet Union and Japan as well extend their efforts in this endeavor. The main reason for special assistance is that the fourth-group nations have received the most serious damage in the recent oil crisis. The World Bank estimates that an emergency fund of three billion dollars in extra-concessional aid is necessary to ameliorate the suffering of one billion people in thirty or so non-oil producing developing nations, who do not have the ability to pay for oil, food and fertilizer. For some time the increase necessary to offset quadrupled oil prices and tripled food and fertilizer prices will require 15 billion dollars per year. This is almost double the eight billion that the United States, Western Europe and Japan have given in development assistance in the last several years. Although I am not aware of any specific examples, I am sure that the Soviet Union and China have proposals for a program of international cooperation designed to bring the LDDC group out of the throes of poverty.

3. The Threat of Food Shortages

A food shortage emerged in 1972, which, I believe, is due to the following factors. Total world food demand in recent years has increased annually by 30 million tons. For the most part this

represents an increase in the demand for animal feed grain in the advanced nations and in food grains in the developing nations in response to population growth. Total grain demand in 1972 was estimated at ^{1,200}~~12,000~~ million tons, but production fell short by 50 million tons. After the 20 million tons in storage was consumed there was still a shortage of 30 million tons forcing a self-imposed, painful cutback on the demand for grain by the developing countries. The result was sudden jumps in food grain prices throughout the world, particularly in the developing nations. Production increased during 1973 by 60 or 70 million tons over 1972, but still it could not compensate for a 20 million-ton decrease in storage. The imbalance in supply and demand was not redressed, and import prices for rice and wheat climbed sharply. The June 1972 price for wheat was US \$50 per ton; in January 1973 it was £330. The price of rice went from \$100 to £600 for the same period.

Until recently, rice and wheat prices in Japan were some three times the international level, a fact that has brought severe criticism of the protectionist policy that has caused this difference. If present US export prices are converted into Japanese yen, the C.I.F. price of ¥175,000. In terms of brown rice, the US export price is ¥164,000 compared to the domestic grower's price of ¥173,000, creating only a small difference between the two. The present international prices and Japanese domestic prices are almost the same. One important element that has caused such change in the past two years is the tremendous amount of wheat buying by the Soviet Union. Charts 4-1 and 4-2 illustrate the effects of this factor.

Chart 4-1

Wheat Trade

(1 = 10,000 tons)

		1971-72 fiscal year (tentative figures)	1972-73 fiscal year (estimated figures)
	United States	1,720 (42%)	3,060 (56%)
	Canada	1,270 (31)	1,560 (29)
Net	Australia	840 (21)	580 (11)
	Argentina	110 (3)	220 (4)
Export	Soviet Union	150 (4)	
	Total	4,090 (100)	5,420 (100)

	Japan	500	530
	Western Europe	290	100
Net	Eastern Europe	460	460
	Soviet Union		1,420
Import	China	300	430
	Other Areas	2,540	2,480
	Total	4,090	5,420

Source: USDA Statistics

Chart 4-2

Trade in Animal Feed Grains

(1 = 10,000 tons)

		1971 (tentative figures)	1972 (estimated figures)
	United States	2,100 (53%)	2,690 (63%)
	Canada	420 (11)	350 (8)
Net	Australia	330 (8)	350 (8)
	Argentina	670 (17)	410 (10)
Export	South Africa	290 (7)	370 (9)
	Thailand	170 (4)	100 (2)
	Total	3,980 (100)	4,270 (100)

	Japan	1,000	1,160
Net	Western Europe	1,640	1,560
	Eastern Europe	380	420
Import	Soviet Union	390	570
	Other Areas	570	560
	Total	3,980	4,270

Source: FAO, World Agricultural, Forestry and Fisheries Production

Note: Total includes rye, barley, oats, maize and sorghum.

Chart 5

Estimates of the Supply and Demand of Grain
in the Soviet Union, 1970 and 1972

(1 = 1 million tons)

	1970		1972
	Wheat	All Grains	All Grains
Production	84.9	158.0	142.8
Demand			
Food	37.2	43.2	44.1
Animal Feed	30.0	90.0	102.0
Seed	11.0	20.0	20.0
Net Export	2.5	3.5	-10.0
Total	80.7	156.7	156.1
Balance	4.2	1.3	-13.3

-
- (1) The balance for 1970 is estimated to include increases in storage and statistical error. For 1972 the figures include exports for the first half of 1973, decreases in storage and curtailed demand for food and animal feed grain.
- (2) American estimations put production at 168.0 and imports at 20.0. •
USDA, Agriculture in Communist Areas, Review of 1972 and Outlook for 1973.

The reason for the Soviet Union's massive wheat purchases is twofold: 1972 was a lean year with unfavorable weather and there was, simultaneously, an increased demand for animal feed grains. Char 5 shows the estimated demand and supply for grain in the Soviet Union, compiled by Japanese specialists from official Soviet statistics.

Professor Stepanov of the Soviet Union recognizes that there has been pressure from the rapid increase in demand for animal feed grains. He points out that successful completion of the livestock production goal in the Five-year Plan will require that production goals for concentrated feeds be raised by as 30 million tons. The year 1973 is reported to have been a good crop year with a 44.2 million-ton increase over the previous year. Nevertheless, considering the averages of the past several years, some specialists believe that the Soviet Union will be forced to import at least a few million tons of wheat each year.

China also imports much of its food needs from other countries. According to the FAO Trade Yearbook, China's grain imports from non-Communist countries amounted to 4 million tons in 1969, 4.7 million tons in 1970, and 3.2 million tons each for 1971 and 1972. (The official Chinese figure for 1972 is 5 million tons.) Domestic food production as reported by the People's Daily was 240 million tons in 1970, 250 million tons in 1971, and 240 million tons in 1972. These figures explain the necessity of China's increases in food imports. China apparently had a good crop in 1973, producing as much as 270 million tons. Even with this increase and

the assumption that food production will grow each year as chemical fertilizer plants, small and large, increase their output, China will still have to continue importing several million tons of grain every year.

As long as the Soviet Union and China remain in the liabilities column of the world food balance sheet, their influence and leadership in the developing countries will inevitably remain impaired, and their bargaining power vis-à-vis the United States, Canada and Australia will be weakened. These three alone accounted for 89 percent of the world's total grain and soybean trade in 1972.

It is crystal-clear now that the uneven distribution of natural resources applies to agricultural products as well.

Let us look at the per capit arable land in each region of the world.

North America	2.10 hectares
Western Europe	0.37 "
Soviet Union	1.50 "
South America	2.30 "
Asia	0.34 "
Africa	2.10 "

Source: The World's Food Problem, A report by the United States Presidential Economic Advisory Committee, 1967.

As is evident from these figures, Asia's per capita land is one-sixth that of North America, or conversely that Asian population density is six times as great as the North American. What is worse, statistics show that more than 80 percent of Asia's arable land is already under cultivation, compared to only 50 percent in North America. Thus, the only way Asian countries can raise food production is to raise the per acre yield through improved irrigation, better fertilizer and other intensive farming techniques. Specialists agree that the success of the "Green Revolution" has been heavily dependent on irrigation and the use of fertilizer. However, total irrigation of the Delta areas, the center of rice culture in Asia, would require enormous agricultural investment. Let us assume that irrigation of one hectare of land would cost \$1,000 as suggested by Erlich and others in Population, Resources and Environment. Since the farmers per hectare and that each invests in the project ten percent of the income from production. Even if improve irrigation doubled the annual yield, the average yearly growth rate would be only about 2.2 percent. This is but one small indication of how difficult it is to conquer the problem of food shortage problem, it is essential that the developing countries receive technical assistance from the industrialized nations.

Accordingly, although some of the OPEC countries such as Saudi Arabia, Kuwait, Abu Dhabi and Qatar are free from this problem and can benefit from higher oil prices, others cannot. The OPEC countries of Iran, Iraq, Algeria, Libya, Indonesia,

Nigeria, Venezuela, Peru and Ecuador have large populations which complicates the food problem. Because of this they find it difficult to increase the price of oil further by curtailing production, and they are forced to seek cooperation from the industrialized countries. Actually, however, Iran occupies an intermediate position, for even if it were to promote industrialization, it would still have a surplus income of ten billion dollars from oil revenues after meeting the requirements for domestic investment in 1974. Thus, the oil producing countries are far from being a unified, solid bloc.

4. The Conflict Between Oil Producing and Consuming Nations

Just as the unity of the oil-producing nations lacks solidarity, so too do the oil-consuming countries have little that would unite them. The most recent installment in the Middle East war has had far-reaching influence on the West European countries and on Japan; it has loosened the ties of the common market countries and revealed the essential vulnerability of Japanese economic power. As Chart 6 shows soaring oil prices will result in tremendous sums being paid out for this energy source by the industrialized nations.

The impact of the oil crisis came hard on the heels of several other jolts for Japan. These earlier events are what are popularly known as the "Nixon shocks," the first being the US president's announcement of new diplomatic overtures to China, then

Chart 6. Payments For Imported Oil

(1 = US \$1 billion)

	1972	1973
United States	5	21*
Western Europe	11	51
Japan	4	16**

* A \$13 billion deficit in the trade balance is expected after this payment. That sum is greater than the total gold and foreign currency reserves held by the United States.

** This figure is greater than current total foreign currency reserves held by Japan.

the New Economic Policy which directly affected Japan in the form of yen revaluation, and lastly, the ban on the export of soybeans by the United States, Japan's chief supplier of that commodity. The oil crisis has only further served to heighten Japanese distrust of US intent. For all practical purposes, though, the Japanese economy seems to be getting closer to that of the United States. If the OPEC nations worked together in tight concert to push up oil prices or cut back on production, the industrial power of the United States, Western Europe and Japan would unite thus forming a solid front of consumers to confront the producing bloc. This would represent the completion of one monopoly competing

against another, what can be called a bilateral monopoly. In addition to these countermeasures, the United States is reportedly planning to reduce its dependence on Middle East oil from the present 35-40 percent to the 10-15 percent range by the 1980-85 period.

The main indicators of economic conditions in the Middle Eastern countries are given in Chart 7. Chart 8 shows the estimated oil incomes of the oil producing countries in areas other than the Middle East.

Countries with large populations will use their oil-dollars, an annual total of \$10 to \$20 billion, in domestic investment. The Saudi Arabian group with only a small population, is expected to have accumulated as much as \$740 billion by 1980; if it cannot find suitable ways to utilize oil revenue, the group may decide to curtail production. The ideal situation would be one in which the surplus foreign reserves of these countries is combined with the technological know-how, industrial capacity and human resources of the advanced nations and invested liberally in the development of countries in the Fourth World.

If we look at the relations between the oil-producing and oil-consuming countries, we see that the major oil corporations are in a very unique position. During the 1965-69 period, they controlled 68 percent of total oil production in the entire free world. That percentage is now decreasing, however, as the producing countries move to raise their level of capital participation in the production process. With the heightened sense of

Chart 7. Economic Indications of the Middle Eastern Countries

Country	Political System	Population (Million) 1970	Exports (\$ Million) 1970	Imports (\$ Million) 1970	GNP (\$ 100 Million) 1970	Per Capita National Income (\$) 1970	GNP Growth rate late '60's	Gold and Foreign Reserves	Currency (\$ Million)	Oil production (Million tons) 1971	Estimated Oil Income 1971 (\$ Billion)	Estimated Oil Income 1980 (\$ Billion)
Iraq	Military Regime	9.4	1,099	509	28.6	291	(nominal) 6.9	as of (4/73) 1,013		84	6.1	21.2
Iran	Constitutional Monarchy	28.7	2,354	1,658	128.0	430	12.2	(3/73) 1,167		227	16.1	33.9
Saudi Arabia	Monarchy	7.3	2,360	750	29.3	355	9.3	(4/73) 3,212		224	22.0	50.8
Kuwait	Constitutional Monarchy	0.7	1,581	625	23.5	3,277	(nominal) 7.8	(4/73) 444		147	8.5	12.7
Egypt	Republic	33.3	762	773	64.0	171	3.2	(2/73) 176		15		
Syria	Republic	6.1	203	360	16.6	236	5.0	(4/73) 127		5		
Turkey	Republic	35.2	578	577	123.9	336	8.0	(4/73) 1,718		3		
The Federation of Arab Sheikdoms	Sheikdom	0.2								(Abu Dhabi only) 45		
Yemen	Republic	5.7	('69) 4	32	2.5	40						
Lebanon	Republic	2.8	172	577	15.0	446	(nominal) 7.6	(4/73) 646				
Jordan	Constitutional Monarchy	2.3	34	184	5.6	196	(nominal) 5.4	(4/73) 255				
Bahrein	Sheikdom	0.2	('69) 42	122		(estimated) 540				4	1.6	2.1
Qatar	Sheikdom	0.1								20		
Oman	Monarchy	0.8								14		
South Yemen	Republic	1.5	('69) 140	227	1.5	100		(12/72) 67				
Afghanistan	Military Regime	17.0	86	73	0.1	60		(4/73) 59				
Israel	Republic	3.0	730	1,431	48.0	1,850		(4/73) 1,458				

Chart 8 Estimated Oil Incomes of the OPEC Nations Outside the Middle East.

(1 = US \$1 billion)

	1974	1980
Africa		
Libya	9.1	11.5
Algeria	4.2	8.7
Nigeria	8.6	17.3
South America		
Venezuela	11.0	20.2
Ecuador	1.0	2.9
Southeast Asia		
Indonesia	4.4	14.3
OPEC Total	94.2	206.3

Notes

1. The 1974 oil production for countries other than Ecuador has been estimated at the September 1973 level. The same applies to Chart 7 where the exceptions are Iran and Iraq.
2. Included in oil income is the sales profit on crude oil accrued from capital participation in production. The participation rate for Middle Eastern countries is 25% for 1974. This rate will move to 40% in 1980. Nigeria is 35% for 1974 and will go up to 51% in 1980. Libya and Algeria's rate is 51% for both 1974 and 1980.

Source: Toshiaki Ushijima, Present Conditions in the World Oil Industry and the Oil Policy of OPEC (in Japanese), Sekai no ugoki-sha, 1974.

"resource nationalism" evident on the contemporary scene, this trend will no doubt accelerate, gradually lowering the percentage of oil controlled by the majors. These companies controlled 82 percent of oil production in 11 PEC nations in 1973, but predictions are that this will decline to 65 percent by 1980 and to 48 percent by 1985. Of the remaining 52 percent for 1985, 10 percent will be held by independent companies and the remaining 42 percent by the national companies of the oil-producing countries. These predictions compel the majors to reexamine their worldwide network of supply. In doing so, it is quite unlikely, barring war, that they will give priority to the United States. Chances are, however, that they will treat their subsidiaries favorably according to the percentage of shares that they own in those subsidiaries, giving full precedence to those of 100 percent control. The subsidiaries in Japan have only 50 percent of their capital in the control of the parent company and it is possible that their crude oil supply will be cut at a relatively early stage.

In determining prices, the majors will probably adopt a policy that economists call "price-follower" and it is usually used in the case of duopoly. The price-setters would be the producing countries deciding the price of the DD (direct deal) oil. In making price decisions, the producing countries will most likely raise prices in excess of the level of increase in the direct cost of crude-oil supply on the grounds that the survey and exploitation

costs and the cost of long-term funds have risen. This way they will be able to reap tremendous profits, as they have done recently.

However, since they are in need of the technology controlled by the majors, the producing countries will inevitably aim at a policy of peaceful coexistence, although they may try to capitalize on such measures as raising income taxes and concession fees and raising DD crude oil prices.

During the recent Mideast conflict, Libya, Algeria and Iraq did not adhere to the restrictions on oil production, making it very clear that the producing countries do not have exactly the same interests. "Resource nationalism," however, and the desire to establish permanent sovereignty over domestic resources have stimulated the producing countries to form various kinds of producers' cartels; CIPEC is a copper cartel, IABPC a bauxite cartel, IOPO is an iron ore cartel, to give some examples. They all aim at creating favorable conditions for the economic progress of their member nations, by means of higher prices for primary products, which have lagged behind other industrial products, and through proper control of national resource development. To that end, it appears, the developing countries are steadily moving toward lasting, practical cooperation. Multinational enterprises and foreign companies will increasingly be called on to compromise with this new nationalism in the producing countries.

5. Japanese Strategies for Resources and Food

Japan depends on the Middle East for 81 percent of its energy resources, Southeast Asia for 16 percent and only 3 percent comes from other areas. The itemized breakdown by importing company is given in Chart 9, and it is readily apparent that the rate of dependence on the majors is around 70 percent. Moreover, 94.3 percent of all energy consumed in Japan is derived from imports. Chart 10 shows the proportion of imports to total energy consumed by the major countries of the world.

The degree of self-sufficiency in foodstuffs and animal feed dropped from 90 percent in 1959 to 72 percent in 1971, expressed in monetary values. Further, if one considers only animal feed required for livestock breeding and calculates the amount in terms of calories, Japan's self-sufficiency rate comes to less than 50 percent. The self-sufficiency rate for grains dropped to 40 percent. The EC countries still maintain a rate of 90 percent. A high rate of dependence on foreign energy resources and foodstuffs will, in times of international crises, probably upset the everyday life of the average consumer. To avoid what may be detrimental shocks to the man in the street, the present degree of dependence must be decreased. Some possible countermeasures follow:

- 1) Reserve supplies of oil and foodstuffs. The government decided to require the oil companies to maintain a 60-day reserve supply. They are also considering the development of a five-

Chart 9 Japan's 1972 Crude Oil Imports by Company

	Million kl.	Percent
American Companies		
Caltex	38.2	15.7
Exxon	28.9	11.9
Mobil	22.3	9.2
Gulf	19.7	8.1
Getty Oil	9.6	3.9
Union	8.4	3.4
Others	7.2	3.0
Subtotal	134.2	55.1
British Companies		
Shell	31.3	12.2
British Petroleum	10.3	4.2
Subtotal	41.6	17.1
French Companies		
Cie Française des Pétroles	4.3	1.8
Soviet Union		
Public Oil Corporation of the Soviet Union	1.5	0.6
Japanese Companies		
Arabian Oil	20.3	8.3
North Sumatran Oil	21.0	8.6
Others	41.0	16.8
Total	243.6	100.0

Chart 10

Energy Consumption and Production of Major Countries, 1970

(1 = 1 million coal tons)

	Aggregate Production	Coal and Lignite	Crude Oil	Natural Gas	Hydroelectric and Nuclear Power	Net Imports	Aggregate Consumption	Percentage Imported
World	7,001.36	2,409.35	3,003.65	1,431.50	156.86	-70.56	6,842.63	---
United States	2,053.78	543.35	649.50	826.81	34.12	195.03	2,278.97	8.6
France	59.30	39.03	3.39	9.16	7.72	146.45	193.03	75.9
West Germany	174.32	144.22	9.80	17.33	2.97	151.33	317.06	47.7
Italy	26.39	0.99	1.96	17.54	5.90	126.18	144.10	87.6
United Kingdom	163.65	144.56	0.20	15.00	3.89	130.19	299.14	43.5
Japan	54.82	39.76	1.01	4.00	10.56	313.52	332.37	94.3
Soviet Union	1,210.59	472.60	458.35	263.66	15.99	-145.93	1,076.86	

Notes;

1) Excludes bunker oil for ships.

2) Import percentage = net imports/ consumption

Source: United Nations, World Energy Supplies 1961-1970

year plan to encourage oil companies to maintain an additional 30-day reserve through loans and subsidies. Similar counter-measures were adopted for foodstuffs. In addition to subsidies for the maintenance of a two-month supply of animal fodder, a one-month supply of soybeans (50,000 tons) and 150,000 tons of wheat for fodder. The feasibility of instituting a "grain bank" centered around the procurement and storage of rice for Asian countries is also being investigated.

2) The development of alternative energy resources. For the immediate present, efforts must be redoubled to rapidly develop atomic energy. It is also important to cooperate with the other advanced countries on long-range research for the development of alternative energy resources. .

3) Gradual transformation of the composition of industries to one which saves energy consumption. If this does not lessen energy consumption measurably, it will be necessary to restrain the growth rate. Moreover, excess consumption of energy resources must be curtailed. However, since per capita energy consumed in the non-industrial private sector is less than half the calory rate of Britain or West Germany, there is little leeway for this kind of economizing.

4) Cement friendly relations with the oil producing countries and the Fourth World by intelligently using the facilities and capabilities of the fertilizer industry to alleviate the distress of inadequate agricultural production.

5) Increase the domestic self-sufficiency of agricultural production through subsidies to wheat producing groups and livestock breeders.

6) It is desirable to have even closer economic relations with the U.S., Canada and Australia to remain on friendly terms and to be careful not to be left behind in the development of various energy resources and techniques. This must be done with the least amount of friction.

7) Promote the develop-and-import scheme for both food and oil. Also aim for more long-term contracts and diversify countries from which these vital products are imported.

8) Increases in the production of agricultural products other than rice will mean a net increase in domestic production. In order to do this it will be necessary to increase the market price of wheat and soybeans.

9) Efforts must be made to use the oil dollars of the oil producing countries. This is incumbent on the advanced industrial countries, especially the United States, Western Europe and Japan, adopting a solid front and try to find better outlets for constructively using these excess dollars.

10) By expanding and strengthening the capacities and management of indigenous oil industries, the direct deal with DD oil or Soviet oil can be increased independently of major companies. Furthermore, it is conceivable to establish joint ventures for the distribution of DD oil and other related activities with these Middleeastern or Soviet corporations.