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ARAB ECONOMIC GROWTH AND IMBALANCES

1945 - 1970

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(1) The Arab Economy 25 years Ago

This is a study of the main features of economic development in nine Arab countries since World War II. The choice of the nine countries was not arbitrary. Other Arab countries have been excluded either because of their even more scarce data, as is the case of the two Yemens and the smaller oil-rich countries of Arabia, or because they have been out of the main stream of post-war political development, which had important repercussions on economic performance, as is the case of the three countries of Al-Maghreb.

The simplest review of economic and social conditions in Arab countries at the end of the second world war would have been sufficient to make any attempt at classifying all the nine countries as «underdeveloped» or «traditional» as uninteresting as it would have been misleading. Not only were some of the so-called characteristics of underdeveloped countries inapplicable to some of them, but the differences among them, at that time, were at least as glaring as the similarities. This is just as one might expect in countries where there had been little capital accumulation, limited technological progress and where «the diverse historical heritages (had) not yet been overlaid with the similarities imposed by sustained modern economic growth⁽¹⁾». In such cases a great variety of economic and social conditions would mainly reflect differences in natural resources as well as in social and political institutions which are themselves largely conditioned by these natural resources.

If the term «traditional society», for example, may have fitted Kuwait or Saudi Arabia it would have seemed a highly inappropriate description

(1) Kuznets, S. : *Economic Growth and Structure*, Heinemann Educational Books, London, 1966, p. 230.

of Egypt or Lebanon. But Arab countries also displayed great differences with regard to their economic prospects as they appeared in 1945.

Before oil, which was not commercially produced until 1946, Kuwait was described as deprived of any known ingredient for economic growth. A tribal community relying on the extraction of pearls fishing, some boat-building and sea-borne trade, the town of Kuwait was no more than «a small Arab sea port with sun-baked adobe structures ... unpaved streets, an old-fashioned souk and a primitive port for shallow-draft vessels ...»(1) As yet it had no hospital, budget or constitution(2). When the first population census was undertaken in 1957 Kuwait could boast of only one chemist and two physicians. Like Saudi Arabia, Kuwait had not yet come to make a distinction between public revenue and the ruler's private purse. The ruler was still the tribal chieftain combining the responsibility of maintaining law and order with that of tribal hospitality(3).

Having had longer contact with foreign countries, particularly with Persia and India, the Kuwaitis were as they still are, more urbanized and more sophisticated than the Saudi Arabians. Saudi Arabia's climate and vast arid desert, while protecting her from ever being effectively colonized, have also deprived her, for most of her history, from contact with foreign cultures. Some writers mention that the only two commodities that were introduced into Saudi Arabia between the beginning of Islam and the beginning of the 20th century, were coffee and firearms(4). In fact, during these thirteen centuries there was hardly any significant change in economic and social life. Pastoral activities remained the basis of her economy with the income of the bulk of the population rarely exceeding subsistence level. In 1945 the income of the kingdom was less than £ 5 million, mainly from the pilgrim traffic to Mecca and Medina, and even this was unstable and depended on uncontrollable

(1) IBRD : *The Economic Development of Kuwait*, the Johns Hopkins Press, Baltimore, 1965, p. 28.

(2) Kuwait had her first hospital in 1949, her first budget in 1960 and did not have a constitution until 1962.

(3) See Shebab, F. : *Kuwait, A Super-Affluent Society*, in Thompson, J. and Reischauer, R. (eds.) : *Modernization in the Arab World*, Van Nostrand Co., Princeton, New Jersey, 1966, pp. 128-30.

(4) Rentz, G. *Saudi Arabia : The Islamic Island* in *ibid*, pp. 118-9.

circumstances outside Arabia. During the reign of King Abd El-Aziz Al Saud, which lasted for the entire first half of the century (1902-53), the first newspaper, car and aeroplane were introduced, but at mid-century Saudi Arabia was still resisting changes and reforms which other poor countries had long ago taken for granted. The introduction of the telephone proved particularly difficult with the conservative Wahhabi Ulama arguing that the instruments «must be agents of the devil since they could carry the voice so far».⁽¹⁾ When one foreign expert tried to explain to King Abd El-Aziz that the basis of all sound finance was to separate the income of the royal family from that of the state, the idea seemed so outrageous to the king that the expert had soon to take his leave⁽²⁾. Saudi Arabia had to wait another decade for females would be admitted to school and for slavery to be abolished. As late as 1959 the Prime Minister had to call out the army to open the country's first girls' school against protests of Wahhabi traditionalists, and in 1962 the government announced that it had bought all slaves in the kingdom at price of £ 1,000 a piece, and had given them their freedom⁽³⁾. Yet, whatever Saudi Arabia may have lost by her long isolation her population has thereby retained a degree of homogeneity, reflected in a common language, religion and system of values which many countries might envy. For such homogeneity to have contributed to economic development, other ingredients of growth were also required. Some of these were provided by the flow of oil revenue, but with oil, homogeneity and social harmony were gradually lost.

The nearest in traditionalism to Kuwait and Saudi Arabia were Libya and Jordan, but in contrast to the high degree of self sufficiency of the former the very existence of Jordan and Libya was largely dependent on outside support. Artificially created by Britain and France after World War I, the existence of Transjordan as an independent unit had hardly any economic justification. The area falling east of the Jordan river is essentially arid, poor in fuel resources as well as in raw materials other than phosphates, the unexploited salts of the Dead Sea. It had too small a population and the mouth of Aqaba was its

(1) Fisher, S. : *The Middle East, A History*, A. Knope, N.Y., 1959, p. 530.

(2) Van der Meulen, D. : *The Wells of Ibn Saud*, J. Murray, London, 1957, pp. 188-9.

(3) Holden, D. : *Farewell to Arabia*, Faber & Faber, London, 1966, pp. 135-6.

only access to the sea. Its meagre agricultural resources were both undeveloped and subject to the extreme fluctuations of rainfall. Industry was almost non-existent, being virtually confined to flour milling, olive processing and weaving. When, in 1948, the eastern part of Palestine was added to Transjordan, thus constituting the new Kingdom of Jordan, the population tripled while agricultural land increased by only one third. The pressure of Palestinian refugees, most of whom had left their capital and means of livelihood behind, was felt not only on agricultural land but also on housing, health and other services. As a result of the Arab-Israeli war of 1948 Jordan also lost her access to the Palestinian port of Haifa and the coastal region of Palestine on which Jordan depended for the disposal of her surplus vegetables and fruit⁽¹⁾, while the continuing state of tension with Israel discouraged private investment and made expenditure on defence far beyond Jordan's capacity. Jordan therefore came to be heavily dependent on British and later on American aid. In the early 1950's foreign grants accounted for more than 50% of government receipts and about one third of national income while the entire military establishment was financed by Britain⁽²⁾.

To call Libya at the end of the war an underdeveloped country would have been rather flattering. Libya seemed not to deserve the term in the sense in which it could be used to describe North America or Australia in the 18th and 19th centuries. A population of no more than a million may have seemed tiny for a country of 1.75 million square kilometres and yet a U.N. mission considering Libya's resources at the time was inclined to regard it as «overdeveloped» in the sense of having already exhausted her meagre resources⁽³⁾. As late as 1958, but before oil was discovered, Libya was taken as a good reference point for comparison with other countries for being at the bottom of the range of income and resources⁽⁴⁾. Poor in industrial raw materials and skilled labour and with almost no indigenous entrepreneurship, capital accumulation was said

(1) Over 80% of Transjordan's exports before the 1948 war was either sold to Palestine or exported through Haifa (Mazur, M., *Economic Development of Jordan*, in Cooper, Ch. and Alexander, S. (eds.) : *Economic Development and Population Growth in the Middle East*, American Elsevier, N.Y., 1972, p. 211.

(2) IBRD : *The Economic Development of Jordan*, Oxford University Press, London, 1957, p. 27; Mazur, *op. cit.*, and Harris, G. : *Jordan, its People, its Society, its Culture*, Grove Press, N.Y., 1958, p. 14.

(3) U.N. : Technical Assistance Programme : *The Economic and Social Development of Libya*, N.Y., 1953, p. 6.

(4) Higgins, B. : *Economic Development*, Norton, N.Y., 1959, p. 26.

to be zero, or even negative, if account is taken of the destruction caused by the war and the uneconomic use of land. Possibilities for agricultural expansion seemed at the time severely limited and it was uncertain how far the extension of irrigation would reduce the water resources of the land already irrigated. B. Higgins described Libya's economy as «deficitary» referring to her continuous deficit in the balance of payment, in the budget of each of the three provinces, in the operation of the power plant in Tripoli as well as of the railways and the harbour⁽¹⁾. For three decades after Italian occupation, these deficits were met by the Italians, then by the two administrating powers, Britain and France, and after Libya's independence in 1951 were covered by both foreign aid and leases of military bases. In the year (1958) just preceding the discovery of oil, Libya received 214% of the value of all her merchandise exports, in official donations, amounting to \$25 per capita⁽²⁾ and Higgins wrote that «if Libya was to be brought to a stage of sustained growth, there is hope for every country in the world».⁽³⁾

If, of our nine Arab countries, Libya was at the bottom of the scale, Lebanon was at the top. When per capita income in the other Arab countries was no more than \$100 per annum, and in four of them less than \$50, Lebanon's per capita income was estimated at \$140 (1949).⁽⁴⁾ Among the Arab countries Lebanon had the lowest mortality and birth rates, the highest share of manufacturing in national income (12% in 1951),⁽⁵⁾ the highest rates of literacy and urbanization, the highest number of physicians per capita as well as the most advanced road system⁽⁶⁾.

(1) *ibid.*, pp. 28-9.

(2) The corresponding figures for Jordan, but including the flow of some private short-term capital were 799% and \$45 respectively in the same year. (U.N. : *International Flow of Long-Term Capital and Official Donations (1951-59)*, 1961, pp. 28-9.

(3) Higgins, *op. cit.*, p. 37.

(4) Estimates of per capita income in American dollars in 1949 were : Lebanon 140, Egypt and Syria 100, Iraq 85 and Jordan (1950) 93. An estimate of less than \$50 was made for the Sudan for 1956. For Kuwait one source mentions \$21 at the end of the war and another mentions \$35 as the average income of a skilled labourer (at pre-war prices) before oil started to flow in commercial quantities (1946) and another source mentions \$25 for Libya. (U. N., Department of Economic Affairs : *Review of Economic Conditions in the Middle East*, 1951, p. 12; Berger, M. : *The Arab World To-day*, Anchor Books, 1962, pp. 200-1; U.N. : *Structure and Growth of Selected African Economies* (mimeo), 1958, p. 149; El-Mallakh, R. : *Economic Development and Regional Cooperation : Kuwait*, The University of Chicago Press, Chicago, 1968, p. 6.; Shehab, F. *op. cit.*, p. 129 and Higgins, B. : *op. cit.*, p. 8.

(5) U.N. : *Yearbook of National Accounts Statistics*, 1958.

(6) U.N. ; *Statistical Yearbook*, 1951 and *Review of Economic Conditions in the Middle East*, 1950.

Lebanon's relative prosperity was not new. At the beginning of the century Beirut had already been the main commercial centre for goods passing to and from Lebanon, Syria, Palestine, Northern Iraq and Southern Turkey. Her exports of new silk had been flourishing and the large outflow of Lebanese emigrants were either sending or bringing their accumulated savings and skill back to Lebanon. By the end of the second world war these three factors had considerably declined in importance. The Mulberry trees which fed the silk worm had already been cut down for timber during World War I, and after the war increasing foreign competition, as well as the development of rayon, put an end to the silk industry. Migration was facing increasing restrictions from the receiving countries. In 1950 Beirut was also to suffer as a trading centre as a result of the break-up of the economic union with Syria. The Lebanese have, however, characteristically responded well to the challenge. Mulberry trees were replaced by fruit trees which generated far greater income and tourist attractions were promoted including the building up of wide network of roads. Typically also Lebanon realized some important gains from the Arab-Israeli war of 1948. Much of the trade which used to pass through Palestine, and particularly through Haifa now turned to Beirut. Sidon and Tripoli, rather than Haifa were to become the terminal of the pipelines carrying oil from Saudi Arabia and Iraq. Like Jordan, Lebanon had to receive her share of Palestinian refugees, but many of them brought large sums of capital to Lebanon. Later on, Lebanon was again to benefit from the flow of capital from the oil-rich countries as well as from other Arab countries turning «socialist».

What is perhaps the most distinguishing economic feature of the remaining four countries : Sudan, Iraq, Syria and Egypt, when compared with the five already discussed is the former countries' relative richness in agricultural resources. Among these four no one had gone as far as Egypt in exploiting its agricultural resources, but nor had any of the nine such a degree of population pressure on agricultural land. Per capita cultivated land in Egypt was about half that of Lebanon, one fourth that of Jordan and about one tenth of that in Iraq and Syria⁽¹⁾.

(1) Compared with no more than 388,000 hectares of cultivable land estimated for Lebanon in the early 1950's and 945,000 for Jordan, there were 3,495,000 in Egypt and about double this amount in each of Iraq and Syria while an estimate of 48 million hectares of cultivable land was made for the Sudan. (U.N. : *Economic Development in the Middle East, 1945-54*, N.Y., 1955, pp. 93-4 & 181; U.N. : *Review of Economic Conditions in the Middle East*, N.Y., 1951, p. 69 and 1951-2, p. 16; Burns, N. : *Middle East Economic Problems* (mimeo.), Johns Hopkins University, 1951, Ch 6 and Fauzi, S. : *Some Aspects of the Sudanese Economy*, Institute of Arab Studies, (Arabic), Cairo 1958, p. 21.

In this respect Egypt more nearly resembled such countries as India or China whose overpopulation was the result of their very success in developing their agricultural resources to support a large population *before* their population started to grow at high rates. In the early 1950's R. Nurkse could therefore write that «the highest estimate of the degree of disguised unemployment that I have seen ... are for Egypt⁽¹⁾». While in Egypt one could speak of the marginal productivity of agricultural labour as being close to zero ⁽²⁾, the marginal productivity of land in the Sudan and Iraq seemed negligible, in the sense that a loss of some of the cultivated land would have hardly have affected agricultural production.

Sudan was, however, to stand out among the four «agricultural countries» as the country with the lowest share of industrial output in total product, the least developed infrastructure, the poorest in skilled labour and management as well as the lowest level of education and health.

Of all the nine countries, Egypt, Iraq and Syria seemed to have the brightest prospects for industrial development. With the exception of Lebanon, these three countries emerged from the war with the most developed infrastructure, but they, and particularly Egypt, had the advantage over Lebanon of having a larger population, while Syria and Iraq had a much greater potential in agriculture. If Syria with her relatively small population and a poorly developed transport system⁽³⁾ still lacked a market wide enough to allow the establishment of large-scale industries, this was hopefully to be overcome by her forming, with other Arab countries, a wider economic bloc in which Lebanon was soon to show little interest.

(1) Nurkse, R. : *Problems of Capital Formation in Underdeveloped Countries* (1953), Oxford University Press. N.Y., 1966, p. 35.

(2) The very existence of disguised unemployment in Egypt was later doubted, though at least not for the 1930's, by Bent Hansen especially on the basis of more recent data which indicated that earlier estimates of disguised unemployment (ranging from 40% to 50% of the agricultural labour force) had underestimated the substantial amount of non-field and non-agricultural work performed by the peasants. (See Hansen, B. and Marzouk, C. : *Development and Economic Policy in the U.A.R.*, North-Holland, Amsterdam, 1965, pp. 60-4 and Hansen, B. : *Employment and Wages in Rural Egypt*, *American Economic Review*, June 1969.)

(3) At the outbreak of World War II the French gave to Turkey the North-Western corner of Syria which resulted in breaking Syria's railway system into three segments connected only through Turkey and Lebanon (Hansen, B. : *Economic Development in Syria*, Rand Corporation, 1969, p. 6 & pp. 39-40).

In the three of them, as well as in Lebanon, the war had led to the accumulation of large sums of capital which were either difficult to spend during the war years or were owed to them by Britain and France⁽¹⁾. The war had also given a big boost to their industries by providing them with a protection which again Lebanon was soon to discontinue. In the late 1940's the rate of gross domestic savings to GNP in Egypt and that of gross investment in Iraq was no less than one tenth, while Syria was investing a percentage of GNP as high as 13-14%⁽²⁾. The output of industry and electricity grew by as much as 46% between 1945 and 1950 in Egypt and by about 150% in three years in Iraq (1948/9 - 51/2) while Syria's output of cotton yarn and rayon was, in 1953, nine to ten times its prewar level and that of textiles about seven times⁽³⁾. But of all the nine countries Iraq was the one which promised to grow fastest. Despite having a lower per capita income than Egypt and Syria, Iraq seemed to lack nothing of what was then considered the most important conditions for rapid growth. Compared with Egypt, Iraq had abundance of cultivable land and her oil revenue was to relieve her from capital shortage. In 1950 Iraq was producing less oil than Kuwait or Saudi Arabia, but in the following three years her oil production was to increase four times while she suffered neither from the smallness of population as did Kuwait nor was her infrastructure as backward as that of Saudi Arabia. Little wonder that referring to the economic prospects of Iraq, a British report of the early 1950's stated that :

“Granting wise administration, peace and stability, Iraq has a prospect of a rapid advance in national prosperity and individual welfare which has been rarely equalled in history”.⁽⁴⁾

(1) Britain was indebted by £430 million to Egypt and £57.9 million to Iraq in 1946 and 1947 respectively and France was indebted to Syria by 10,204 million Francs by January 1948 (U.N. : *Economic Development in the Middle East*, 1945-54, p. 92 & 197 and Sha'ei, Z. : *Introduction to Money and Banking*, (Arabic), Cairo, 1964, p. 151).

(2) Hansen and Marzouk, *op. cit.* p. 324; Jalal, F. : *The Role of Government in the Industrialization of Iraq*, London, 1972, pp. 6-7 and IBRD : *The Economic Development of Syria*, Johns Hopkins Press, Baltimore, 1955, p. 22

(3) Hansen, B. and Marzouk, C. : *op. cit.*, 1965, pp. 64; U.N. : *Economic Development in the Middle East* (1945-54), p. 99.; and IBRD : *op. cit.*, p. 21.

(4) Lord Salter's Report "Development of Iraq", quoted in Bullard, R. : *The Middle East, A Political and Economic Survey*, Royal Institute of International Affairs, London, 1958, p. 257.

(2) Economic Growth :

Looking at the nine countries as a whole one is struck by the degree to which they were favoured, relatively to other underdeveloped countries, by conditions that either should or seemed to be conducive to rapid economic advance.

Twenty years ago they had all achieved political independence except Kuwait and the Sudan. The Sudan has now (1971) been independent for fifteen years and Kuwait for ten. Most of them were on the whole more favourably situated with regard to economic and social infrastructure than most other underdeveloped countries, especially when compared to the rest of Africa. With regard to the pressure of population one economic resource they were much better situated than the rest of Asia. Their population was relatively homogeneous and relatively little afflicted with class or tribal divisions. In terms of per capita income they started higher up the scale than most countries in south-east Asia and sub-Saharan Africa. Two decades had passed since Egypt had her revolution, of which one main target was to achieve rapid economic development. Syria started her revolution three years earlier and although Iraq's revolution came relatively late Iraq had already started preparing development plans before any other Arab country and most of her oil revenue was assigned for development as early as 1952.

During the two decades following the war (1946-64) the oil producing together with the oil-transit Arab countries, which excludes only the Sudan, received more than \$13 billion in addition to about \$2.5 billion in wages and local purchases by the oil companies(1) They have received a larger amount of aid per capita than probably any other area in the world. During the same period U.S. economic aid together with the aid commitments of the Sino-Soviet bloc to the nine countries totalled more than \$3.6 billion(2). To Egypt alone went no less than one fifth of the total credit commitments of the Soviet Union to all countries between 1954 and 1966(3), and Jordan's receipts of official aid have been one

(1) Ramba, O. : *Basic Conflicts of Economic Development in the Middle East*, in Thompson J. & Reishauer, R. (eds.), *op. cit.*, p. 83.

(2) See table (1)

(3) Tansky, L. : *U.S. and U.S.S.R. Aid to Developing Countries*, Praeger, 1967, pp. 18 - 19.

Data on actual disbursements as distinct from commitments are not available but the ratio between them has been estimated to be about 40%. Soviet military aid was estimated to be five times greater than economic aid (See Issawi, Charles : *Growth and Structural Change in the Middle East*, *Middle East Journal*, Summer, 1971, pp. 310-1 and Vatikiotis, P. : *Conflict in the Middle East*, Allen & Unwin, London, 1971, p. 125).

of the highest in the world both in absolute value per capita⁽¹⁾ and as a percentage of GDP⁽²⁾.

Population did grow at accelerating rates but in this respect they were not in a worse position than most countries in Asia and Latin America⁽³⁾.

During the past two decades Arab countries have in fact shown some impressive rates of growth, and in spite of rapid population growth, real per capita income rose in most of them at an average annual rate of more than 2%. Not only the oil countries but also Jordan achieved much higher rates of growth than the average rate for underdeveloped countries. During the period 1953-68 Iraq had a regular growth rate of real GDP of 6 to 7% per annum⁽⁴⁾. During the 1960's Kuwait realized

(1) The annual net official flow of aid to Jordan (both bilateral and multilateral) amounted on average (1964-67) to \$32 per capita which was the highest in the world after Israel (44) and New Guinea (38). The total flow of external long-term capital and donations into Jordan in 1957-68 was on average \$76 per capita, which was second only to Israel (106). (Pearson, L. : *Partners in Development*, Praeger Paperbacks, 1969 p. 393 and U.N. : *The External Financing of Economic Development* (1964-68), N.Y., 1970, p. 67.)

(2) The average for 1964-67 was 14.8% of GDP which was surpassed only by Laos, New Guinea and South Vietnam (Pearson, *op. cit.*).

(3) The three stages through which, according to Arthur Lewis, the rate of population growth tends to pass if the birth rate remains more or less constant at about 40 per thousand, seem roughly to have applied to the Arab world. The first stage in which the death rate tends to decline from about 40 to 30 per thousand and population therefore increases by about 1% seems to have characterized the Arab countries before the second world war. The further decline of the death rate from about 30 to 20 per thousand as a result of the application of modern medical facilities occurred in most Arab countries during and just after the war, when the rate of population growth rose to about 2% largely as a result of the introduction by Britain and her allies of large-scale modern drugs and insecticides to protect the health of their soldiers. During the 1960's with a birth rate ranging between 40 per thousand in Lebanon and 52 in Kuwait, and a death rate ranging between 11 in Lebanon to 21 in the Sudan, Arab population has been growing at about 3% annually. (see table 2.) While this rate is the same as that of Lewis' third stage it cannot be said for most Arab countries that medical facilities are now available to most individuals all over the country as Lewis assumes to happen in this stage. The growth rate of about 3% has therefore been realized because *both* birth and death rates have been considerably higher than those assumed by Lewis. (See Lewis, A. : *The Theory of Economic Growth*, Allen & Unwin, London, 1957, pp. 306-7).

(4) U.N. : *Yearbook of National Accounts Statistics*, 1969.

TABLE I.
Long-Term Economic Aid
(Million U.S. \$)

From	U.S.A. (July 1, 1945 - June 30, 1964)	All D.A.C.(1) Countries & Multilateral Agencies (Net Official Receipts only) (1964-69)	Sino-Soviet Bloc Commitments		
			1954-64	1965-69	1954-69
To					
Kuwait	—	- 20.2	—	—	—
Saudi Arabia	46.6	- 31.6	—	—	—
Iraq	46.3	55.6	217	270	487
Libya	205.3	11.6(a)	—	—	—
Egypt	943.1	231.9(a)	1282	452	1734
Sudan	81.4	107.1(a)	22	27	49
Syria	81.9	47.0	231	275	506
Jordan	431.6	284.0(a)	—	—	—
Lebanon	78.9	65.6	—	—	—
Total	1915.1		1752	1024	2776

(a) 1965-69

(—) Nil or negligible quantities

(1) Development Assistance Committee of the OECD which includes U.S., Canada, Western European States and Japan

Sources : OECD : *Development Assistance*, 1968 Review, p. 271; 1969 Review, pp 170-171 and 1970 Review, pp. 194-5; U.N. : *The External Financing of Economic Development*, 1962-66, N.Y. 1968, pp. 16-7; 1964-68, N.Y. 1970, pp. 45-6; and U.N., Economic and Social Council : *Financing Economic Development of the Developing Countries*, 1969, June 1970, (mimeo.), pp. 13-4; and Ramba, O., *op. cit.*, p. 84.

TABLE 2.
Population Estimates (1970), Crude Death and Birth Rates,
and Natural Rates of Population Growth (1960-65)

Country	Population	Birth	Death	Natural
	Estimates on 1 January, 1970 (1000)	Rate Per 1000 of Population	Rate	Rate of Population Growth (%)
Kuwait	648	52	14	3.8
Saudi Arabia	5,074	50(a)	23(a)	2.7(a)
Iraq	9,519	48	20	2.8
Libya	1,904	46	18	2.8
Egypt	33,306	42	16	2.6
Sudan	15,389	49	21	2.8
Syria	6,137	48	18	3.0
Jordan	2,238	47	16	3.1
Lebanon	2,614	40	11	2.9

(a) estimates for 1965-70

Sources : UNESOB : *Studies on Selected Development Problems in Various Countries in the Middle East*, 1970, p. 73 and U.N., Department of Economic and Social Affairs : *A Concise Summary of World Population Situation in 1970*, pp. 34-5.

an average annual rate of growth of 7 to 8%⁽¹⁾, and Saudi Arabia an even higher rate⁽²⁾ while Libya's rate of growth was the highest in the world⁽³⁾.

(1) El-Mallakh, *op cit.* p. 7.

(2) E. Asfour estimated the average annual real rate of growth of Saudi Arabia's GNP to be 6% for 1954-5 — 60/1, 11% for 1960/1 — 64/5 and 8% for 1964-67 (*Prospects and Problems of Economic Development of Saudi Arabia, Kuwait and the Gulf Principalities*, in Cooper & Alexander (eds.), *op. cit.*, p. 371. See also UNESOB : *Selected Development Problems*, 1968, p. 26.

(3) After a sluggish growth in both agriculture and industry accompanied by a severe inflation during the 1950's Libya's real domestic product grew, thanks to oil, at the fantastic rate of 21.6% per annum and real per capita income at 17.3% between 1960 and 1970 (OECD : *Development Assistance*, 1971 Review, p. 117).

Also remarkable was the growth rate of Jordan which, counter to pessimistic expectations, surpassed that of oil-rich Iraq⁽¹⁾. Although such high growth rates were not achieved by other Arab countries, each of them, with the exception of the Sudan whose performance was the least impressive⁽²⁾, passed through some periods during which growth was fairly rapid and considerably above that of underdeveloped countries as a whole. This occurred in Syria during the decade following the second world war⁽³⁾, in Egypt between 1956 and 1963⁽⁴⁾ and in Lebanon after the 1958 civil war⁽⁵⁾.

Rates of industrialization were also considerably higher than those of underdeveloped countries taken as a whole. The rate of growth of manufacturing was as high as 16% per annum in Jordan (1959–66) and 11.3% in Saudi Arabia (1962–68) with comparable rates in all of them except Syria⁽⁶⁾.

(1) Jordan's GDP at current market prices grew at an average rate of over 10% between 1954 and 1966 which is one of the highest in the world, even after allowing for a 2% rate of increase in prices. (Mazur, *op. cit.*, p. 215).

(2) During the first four years following independence (1956–60) the annual real growth rate of the modern sector in the Sudan was about 5%. Since the traditional sector is estimated to contribute about 45% of GDP and was growing, during the same period at about 3.3% annually the whole economy would have been growing at about 4.2%. With a rate of population growth of about 2.8% real per capita income would have been growing at only about 1.4%. This last rate declined to less than 1% in the following six years (1960–66) giving Sudan one of the lowest rates of growth in Africa. An estimate made for the whole decade (1960–70) gives the real rate of growth of the whole economy as 4.1% and that of real per capita income as only 1.2%. (See : U.N. : *Survey of Economic Conditions in Africa – 1968*, N.Y., 1972, p. 16; OECD : *Development Assistance, 1971 Review*, Dec. 1971, p. 177 and Wynn, R. : *The Sudan's 10-year Plan of Economic Development 1961/62 – 1970/71 : An Analysis of Achievement to 1967/68*, *Journal of Developing Areas*, July 1971, pp. 557 & 563–4.)

(3) During which the Syrian economy grew at 5 to 6% per year (See Hansen, B. : *Economic Development in Syria*, *op. cit.*, p. V. and IBRD : *The Economic Development of Syria*, *op. cit.*, pp. 20–1).

(4) After a virtual long-term stagnation of Egypt's real per capita income for about half a century and until the mid-1950's, it increased between 1956/7 and 1962/3 at more than 3% annually. (Hansen & Marzouk, *op. cit.*, p. 4).

(5) Lebanon's average annual rates of growth at current prices were estimated at 5.3%, (G.D.P., 1950–57); at 9.5% (G.D.P., 1957–64) and at 7.4% (G.D.P., 1964–68). (See UNESOB : *La Croissance Economique et Le Niveau de Qualification de la Population Active dans Divers Pays du Moyen-Orient* (mimeo.), Beirut, April 1971, p. 102.

(6) see table (5)

It was presumably on the basis of such figures that one writer has recently stated that «the Middle Eastern countries should, on the whole be viewed as examples of past development success⁽¹⁾».

TABLE 3.—Average Annual Rates of Real G.N.P.
At Factor Cost (1960-67) And Per Capita G.N.P. (1967)

Average Annual Growth Rates (1960-1967)	Per Capita G.N.P. in U.S.S. in 1967				
	100	200	300	400	500 or more
More than 6%		Jordan	S. Arabia		Kuwait Libya
5-6%	Egypt		Iraq Syria		
4-5%					Lebanon
3-4%	Sudan				

Sources : Pearson, L. *Partners in Development*, Report of the Commission on International Development, Praeger Paperback, N.Y., 1969, supplemented and modified by other sources referred to above

TABLE 4.—Per Capita GNP in U.S.S in 1968

Kuwait (a)	3474	Jordan	260
Libya	1020	Syria	210
Lebanon	560	Egypt	170
Saudi Arabia (a)	311	Sudan	100
Iraq	260		

(a) 1967/68

Sources : U.N. : *Yearbook of National Accounts Statistics*, 1969 and OECD : *Development Assistance*, 1971 Review, pp. 154-5.

(1) Cooper, Charles, in Cooper & Alexander (eds.), *op. cit.*, p. 4.

TABLE 5. — Average Annual Rates of Growth of Manufacturing Output at Factor Cost at Constant Prices

Country	Period	%
Under-developed- Market Economies	1950-60	6.7
	1960-68	6.2
Libya	1962-68	11.0
Kuwait	1966-68	11.1
Saudi Arabia	1962-68	11.3
Iraq	1953-60	14.1
	1960-68	4.6
	1953-68	8.8
Syria	1956-68	4.8(a)
Jordan	1959-67	13.9(a,b)
Lebanon	1957-68	10.3
Egypt	1957-67	9.3(a)
	1955-60	6.2
Sudan	1960-64	10.7
	1955-64	8.2

(a) Includes mining, quarrying, electricity, gas and water in addition to manufacturing.

(b) At current prices.

Sources ; U.N. : *Yearbook of National Accounts Statistics*, 1968 & 1969; Hansen, B. : *The Economic Development of Syria*, op. cit., p. 11 and UNESOB : *La croissance Economique*, op. cit., p. 57.

TABLE 6.— Oil Revenues (1961-70)

Million Dollars

Year	Kuwait	Saudi Arabia	Iraq	Libya
1961	464.3	400.2	265.5	3.2
1962	526.3	451.1	266.6	38.5
1963	556.7	502.1	325.1	108.8
1964	655.0	651.0	353.1	197.4
1965	671.1	655.2	374.9	371.0
1966	707.2	776.9	394.2	476.0
1967	717.6	852.1	361.2	631.0
1968	765.6	965.5	476.2	952.0
1969	812.2	1008.0	483.5	1132.0
1970	896.5	1200.3	513.3	1294.8

Source : *The World of Oil*, Arabic Weekly, Beirut, 18 Sept. 1971, p. 5.

This is indeed highly doubtful. The high rates of growth in the four oil countries have been mostly the reflection of the rapid growth in oil production. Their ranking with regard to the rate of growth of the whole economy has therefore followed closely their ranking in the rate of growth of oil production.

Between 1961 and 1970 the annual oil revenues accruing to Iraq and Kuwait almost doubled, those of Saudi Arabia tripled, while Libya with a population not exceeding one fifth that of Iraq, received slightly less (in oil revenues in 1970) than those received by Iraq and Kuwait combined.⁽¹⁾

In spite of the rapid increase in per-capita income and in manufacturing production, serious economic and social imbalances continue to exist in all the nine countries, and in many cases tend to be intensified. Their failure to face these weaknesses has been only slightly covered up in the oil-rich countries by the continuing increase in oil revenue from

(1) By 1970 Libya had emerged as the biggest Arab oil exporter and realized the highest revenue from oil among the Middle Eastern countries (see table (6) and The Economist Intelligence Unit : *Quarterly Economic Review, Oil in the Middle East*, No. 1, 1972, pp. 6-7 & 15.)

which Lebanon has also greatly benefitted and in Egypt and Jordan by the large flow of foreign aid. The two countries which were not in either respect so fortunate have either shown poor economic performance all through the last two decades, as we have seen for the Sudan, or suffered a prolonged economic setback, as was the case in Syria.(1)

3.— Economic Structure

In spite of a clear tendency for the share of agriculture in total output to decline, in most cases quite heavily(2), manufacturing still makes a modest contribution to national income, except in Egypt. In 1951 the highest share of manufacturing in GDP (that of Lebanon) was 12%, compared with about 9% for Egypt. By 1968 Egypt had more than doubled this proportion while, among the rest, the highest share was only 13%, and it was as low as 2% in Libya and Saudi Arabia(3), compared with 17% and 18% for such underdeveloped countries as India, Chile or Colombia. In some cases the share of manufacturing in GDP hardly increased at all, as in Saudi Arabia, where this share remained at about 2% since 1963.(4) and in Syria and Lebanon, where it remained at 12% to 13% over a much longer period (1953-57), while in Libya it showed a heavy decline. In Iraq, after a remarkable rate of growth of manufacturing in the 1950's (14% annually between 1953 and 1960) it declined to less than one third of this rate between 1960 and 1968 and thus the share of manufacturing in GNP remained virtually constant at about 9% between 1959 and 1968.(5) The general decline in the share of agriculture was therefore mainly in favour, not of manufactur-

(1) Syria's rapid growth during the post-war years was followed by twelve years (1956-68) during which the annual compound growth rate at constant 1963 factor cost was no more than 4.2% compared with 5% to 6% during the previous decade. Per capita real income grew therefore at only 1% compared with about 3% between 1945 and 1956. In fact, according to Hansen, if the growth of defence is disregarded, per capita income in the period 1956-68 would have probably fallen. (Hansen, B. : *Economic Development in Syria*, op. cit., p. V, 11 and 16.)

(2) See tables (7) & (8)

(3) See table (9)

(4) Economist Intelligence Unit : *Saudi Arabia and Jordan*, No. 1, 1971, p. 6.

(5) U.N. : *Yearbook of National Accounts Statistics*, 1969.

ing, but either of oil, as in Libya, or of construction and services as in most of the rest.⁽¹⁾

TABLE 7.—Development of Sectoral Distribution of GDP
in Three Oil-Producing Countries (Percentages)

Country	Year	Agriculture ⁽¹⁾	Industry		Services	Total GDP
			Mining and Quarrying	Other ⁽²⁾		
Iraq	1953	22	40	10	28	100
	1958	19	36	14	31	100
	1964	19	35	12	34	100
	1968	19	34	14	33	100
Libya	1954	27	7	12	54	100
	1964	7	52	3	38	100
	1968	3	61	8	28	100
Saudi Arabia	1962-3	10	44	13	33	100
	1968-9	6	46	15	33	100

(1) includes agriculture, forestry, hunting and fishing.

(2) includes manufacturing, electricity, gas and construction.

Sources : U.N. : *Yearbook of National Accounts Statistics*, 1969 and UNESOB : *La Croissance Economique*, op. cit., p. 127.

(1) This was nowhere as conspicuous as in Syria where as much as two thirds of the increase in the value added between 1956 and 1968 occurred in the service sector. In Lebanon, while the share of manufacturing remained virtually constant, that of services rose, between 1953 and 1968 from 63 to 70%, perhaps the highest in the world. (see Hansen, B. : *Economic Development in Syria*, p. V, and table 8).

TABLE 8.—Development of Sectoral Distribution of GDP in the Arab Countries

Country	Year	Industry						Total Industry	Services	Total GDP	
		Agriculture(1)	Manufacturing	Mining	Quarrying	Electricity	Gas and Water				Construction
Egypt	1952	41		9				3	12	47	100
	1969	30		22				3	25	45	100
	1968-9	28		23				5	28	44	100
Jordan	1954	30		9				3	12	58	100
	1960	16		9				5	14	70	100
	1968	16		13				6	19	65	100
Syria	1953	44		12				3	15	41	100
	1963	36		13				4	17	47	100
	1969	28		14				4	18	54	100
Lebanon	1953	19		14				4	18	63	100
	1966	11		15				6	21	68	100
	1968	10		15				5	20	70	100
Sudan	1955	60		5				6	11	29	100
	1958	58		5				7	12	30	100
	1964	54		7				6	13	33	100

(1) includes agriculture, forestry, hunting and fishing.

Sources : U.N. : *Yearbook of National Accounts Statistics, 1969*; The Pearson Report, *op. cit.*, pp. 362-3 ; National Bank of Egypt : *Economic Bulletin*, 1970, No. 4

UNESOB : *La Croissance Economique*, *op. cit.*, p. 17; General Union of Arab Chambers of Commerce, Industry and Agriculture : *Arab Economic Development, 1950-65* (Arabic), Beirut, 1957, pp. 11 & 311 and Economist Intelligence Unit : *Syria, Lebanon and Cyprus*, Annual Supplement, 1971, p.5.

TABLE 9.—Sectoral Structure of GDP at Factor Cost (In Million of National Currencies and Percentages)

Sector	(1)		(2)		(2)		(3)		(4)		(5)		(6)		(7)		(8)	
	Egypt 1968-9	% L.E.	Libya 1968	% L.L.	Sudan 1964	% L.S.	S. Arabia 1966-7	% Riyal	Kuwait 1966-7	% K.D.	Iraq 1968	% I.D.	Jordan 1968	% J.D.	Lebanon 1968	% L.L.	Syria 1969	% L.S.
Agriculture	601.5	28	22	3	238.2	54	1007	8	11	0.5	187	19	27.5	16	436	10	1182	24
Mining and Quarrying	461.8	21	515	61	0.3	-	6926	53	1376	61.1	329	34	20.0	12	552	13	702	14
Manufacturing	19	2	24.5	6	250	2	81	3.6	86	9							(c)	
Construction	105.5	5	53	6	25.4	6	535	4	106	4.7	29	3	9.8	6	194	4	191	4
Electricity, Gas & Water	36.6	2	3	-	2.3	1	252	2	52	2.3	16	2	2.3	1	99	2		
Transport, Storage and Communication	115.2	5	30	4	900	7	63	2.8	64	7	14.5	9	380	9	481	10		
Wholesale and Retail Trade	198.9	9	53	6	62.7	14	932	7	214	9.5	59	6	29.1	18	1360	32	783	16
Banking, Insu- rance and Real Estate	10	1	3.6	1	50	-			(a)	15	1	3.0	1	164	4	141	3	
Ownership of Dwellings	115.3	5	40	5	11.6	3	494	4	15	1	12.3	7	235	6	377	8		

TABLE 9 (continued)

Public Administration and Defence	56	7	45.1	10	1113	8	128	5.7	115	12	33.2	20	357	9	706	14		
	533.2 25																	
Services	39	5	24.9	6	643	5	221(b)	9.8	60	6	15.5	9	397	10	364	8		
GDP at Factor																		
Cost (9)	2168	100	840	100	438.6	100	13102	100	2252	100	975	100	167.2	100	4174	100	4927	100

Notes :

- (1) GNP at 1959-60 prices (2) at 1964 prices (3) at current prices (4) at current prices
 (5) at 1966 prices (6) at 1968 prices (7) at 1968 prices (8) NNP at 1963 prices
 (9) percentages may not add up to 100 because of rounding. (—) less than 5%
 (a) excludes real estate (b) includes real estate (c) includes electricity, gas and water.

Sources : U.N. *Yearbook of National Accounts Statistics*, 1969; UNESOB, *La Croissance Economique*, op. cit., p. 276, National Bank of Egypt : *Economic Bulletin* 1970, No. 4; *Economist Intelligence Unit* : *Syria, Lebanon and Cyprus*, Annual Supplement, 1971, p.5 and El-Mallakh, R. : op. cit., pp. 125-7.

But apart from the small contribution of manufacturing to total output, its growth, even where its share in output has been rising, has contributed little to the modernization of other sectors. This was partly the result of the small proportion of capital goods in total manufacturing output, of the small proportion of manufacturing in total exports and of the small proportion of labour engaged in manufacturing to the total labour force.

1.—By far the greatest part of Arab manufacturing still consists of the processing of agricultural goods for consumption. Food, beverages, tobacco, textiles and wearing apparel industries, taken all together, account for more than 50 to 70% of total Arab manufacturing output while another 6 to 8% consists of furniture, wood, paper, printing and publishing. (1) Interindustrial relationships have therefore been of such an elementary kind as the sale of fruits to the fruit processing industry or of leather to the shoe industry ... etc. (2) In countries such as Kuwait and Saudi Arabia where agriculture was less able to provide much of the required raw materials, a good part of manufacturing consisted of such activities as water distillation, the manufacture of salt, printing and publishing, etc. In these two countries, as well as in Libya and Iraq, the establishment of industries based on petroleum and natural gas, either as raw materials or as sources of power, has been far too slow in spite of the recommendations made long ago by international missions or by foreign experts for the establishment of petrochemical and fertilizer industries. As far back as 1952, for example, the World Bank mission to Iraq suggested the construction of a chemical plant at the oil fields in Kirkuk to utilize the natural gas. In 1956 the Little report on Iraq stated that the establishment of rayon and paper industries and recovering sulphur from natural gas were economically justified. In 1965 when these and other industries had already been included in Iraq's development plans for more than ten years many of them were still under consideration. (3). In the same year a little less than two thirds of Saudi

(1) U.N. : *Report of the Symposium on Industrial Development in Arab Countries*, N.Y., 1967, p.2.

(2) For an elaboration of this point for Egypt, see Mabro, R. and O'Brien, P. : *Structural Changes in the Egyptian Economy, 1937-65* in Cook, M.A. (ed.) *Studies in the Economic History of the Middle East*, Oxford University Press, London, 1970, pp. 418-9. See also Mazur, *op. cit.*, p. 220 and Owen, R. *The Economic Aspects of Revolution in the Middle East*, in Vatikiotis, P. (ed.) : *Revolution in the Middle East*, Allen & Unwin, London, 1972.

(3) Jalal, F., *op. cit.*, pp. 33, 36 & 42.

Arabia's natural gas was being flared, the rest being used mainly either as fuel for the petroleum industry itself or reinjected into the oil fields.

2.— In all the nine countries except Egypt, manufactured exports contribute at present less than one tenth of all current receipts of foreign exchange. Even in a field as obvious for the oil producing countries as exporting refined petroleum, little progress has been made, so that in no Arab country does the proportion of refined to crude-oil production at present exceed one fifth. Egypt was the only country in which the share of manufactured exports in total commodity exports rose significantly⁽¹⁾ even though they still consist mainly of such items as textiles, dried onions, processed fruits and vegetables and shoes, while others rely heavily on imported inputs. The corresponding share for Lebanon was even higher than that of Egypt in the late 1960's but Lebanon had already, in the mid-1950's been in the unique position among the Arab countries of having more than one third of her commodity exports consisting of manufactured goods, and the corresponding proportion in the late 1960's was no higher.⁽²⁾ Moreover, as a contributor to total foreign-exchange receipts Lebanon's manufacturing is much less important, the foreign exchange brought to Lebanon by tourism alone being more than that brought by all her commodity exports (excluding re-exports).⁽³⁾

But apart from manufacturing, Arab countries have made little progress even in diversifying their exports of primary products. The oil countries remain virtually as dependent on oil, and Syria and Sudan on cotton as they were two decades ago.⁽⁴⁾

(1) This share rose from 11% in 1950 to 17% in 1959, 21% in 1965 and 29% in 1968-9 (National Bank of Egypt : *Economic Bulletin*, various numbers.)

(2) 32% in 1967-69 compared with 35% in 1954-56 (U.N. : *Yearbook of International Trade Statistics*, 1958 and 1969)

(3) UNESOB : *Studies on Selected Development Problems*, 1970, p. 18.

(4) In *Kuwait* the share of oil in the total value of exports remained at between 97% and 98% during 1958-65 while most of her non-oil exports are re-exports. In *Saudi Arabia* the share of oil declined only slightly from 99.9% in 1954-5 to 97% in 1967. In *Iraq* this share *increased* from 88% (1953-5) to 93.4% (1965-7), and her exports, other than oil, hardly increased at all between 1953 and 1969. In *Libya* the share of oil continued to rise during the 1960's reaching 99.9% in 1969, while the quantity index of non-oil exports *declined* by about 30% between 1962 and 1967. In *Syria* the share of raw cotton in total exports was 37.4% in 1953-5 and 41.0% in 1967-69. In the *Sudan* cotton together with gum arabic, sesame and cotton seed still account for over 80% of total exports.

3.—Available data on the distribution of labour among the various sectors is often out-of-date (1), but there is enough evidence to suggest that the share of labour engaged in manufacturing in the economically active population cannot, at present, be higher than 11% in any Arab country, while in Saudi Arabia, Sudan and Libya it is considerably lower (2) Even in Egypt the increasing share of manufacturing in GDP was far from being reflected in a similar change in the structure of the labour force. Out of an increase in total labour force of about 800,000 persons between 1960 and 1965 manufacturing absorbed only one fourth, while services absorbed more than half the increase. (3) During the same period the share of manufacturing in the total labour force therefore rose from 10% to only 11% and it is unlikely that this share would have risen since then. This could be partly explained, of course, by the rapid growth of the

= Some progress was achieved, however, by Egypt and Jordan. As a result of the expansion of *Egypt's* exports of other agricultural products such as rice, onions and groundnuts as well as some manufactured goods, the share of exports of raw cotton in total exports declined from 86% in 1950 to 55% in 1965 and to an average of 43% in 1968-9. The proportion of vegetables and fruits in *Jordan's* exports declined from 44% in 1954-5 to 35% in 1966-7, while her exports of phosphates, which were non-existent in the early 1950's, constituted 26% of total exports in 1968-69. It is worth noting however that Jordan's exports of tomatoes and phosphates alone constitute no less than 55% of the total value of exports.

Thanks to the relative diversity of her climate and topography with a relatively high level of humidity on the coast, the dry climate of the Bekaa valley, and the low temperature of the mountain, *Lebanon* has always been in the favourable position where no one primary commodity constituted more than 15% of all commodity exports.

(1) See table (10)

(2) Iraq's available data on the size and distribution of the labour force is as old as 1957 but the number of persons employed in manufacturing was estimated at 152,000 in 1967, or no more than 1.7% of the total population. (Republic of Iraq: *Statistical Handbook*, 1957-67, Bagdad, 1968, p. 88)

(3) See Mabro, R.: Industrial Growth, Agricultural Underemployment and the Lewis Model : The Egyptian case, 1947-65, *Journal of Development Studies*, July 1967, p. 333. Commenting on this the same writer says that what happened in Egypt was therefore not as much a reallocation of labour in favour of manufacturing as «a transfer of underemployment from one economic sector to another.»

population, but it was also due to the tendency to favour capital-intensive techniques.⁽¹⁾

In none of the oil-producing countries does the oil-industry occupy more than 4% of the total active population ⁽²⁾, as a result of its high capital intensity and the low rate of refining, transportation and marketing of oil within these countries' borders.⁽³⁾ In 1957 the percentage was no more than 0.2% in Iraq and it is probably lower now, since, as the oil industry matures, it tends to employ less labour in *absolute* terms. It is interesting to note that in the mid-1960's Egypt's oil industry employed more than the number employed by the same industry in any of the Arab oil-rich countries and that Egypt's textile factory employment alone employed more labour than the total employment in the oil industry of all Arab countries combined. ⁽⁴⁾ It is also worth noting that a not insignificant proportion of those employed by the oil industry are foreigners, especially in the higher ranks.⁽⁵⁾

It follows that the two most productive sectors, manufacturing and oil, nowhere occupy more than 15% of the economically active population, while the two sectors which still occupy by far the greatest part of labour are those where low productivity and disguised unemployment are most in evidence : agriculture and services.⁽⁶⁾

(1) See *ibid.*, p. 341 where Mabro points out that the capital-labour ratio in Egyptian manufacturing rose by 116% between 1947 and 1965 and that between 1952 and 1958 while no increase in employment occurred in the «modern sector» capital intensity in establishments of 10 workers and more seem to have increased by 40%. See also Wahba, J. *Surplus Labour and the Choice of Techniques in Egypt*, unpublished M. Sc. thesis. The American University in Cairo, 1971.

(2) See table (10)

(3) It is estimated that it takes roughly 3.5 times as many man-days to produce a ton of refined oil products as a ton of crude oil (Issawi, Charles and Yaganeh, M. *The Economics of Middle Eastern oil*, Faber & Faber, London, 1962, pp. 150-1.)

(4) See Sayegh, K. : *Oil and Arab Regional Development*, Praeger, N.Y. 1968, p. 302 and Issawi and Yaganeh, *op. cit.*, pp. 150-1.

(5) In Saudi Arabia foreigners constitute over one tenth of total employment in the oil industry.

(6) For the relative productivity of labour in agriculture and manufacturing see table (11). As for oil, if one assumes that 80% of the total number employed by the oil industry are engaged in crude production, the average quantity of oil produced per worker could reach 5800 tons per year. The highest level of productivity in the oil sector is that of Kuwait with about 18,000 tons per worker per year. (See Sayegh, K. *op. cit.*, p. 87.)

TABLE.10—Distribution of Economically Active Population By Sector (Percentages)

Country	Primary(1)	Secondary (2)		Tertiary(3)	Activities not Adequately Described + Unemployed	All Sectors
		Total	of which Manufac- turing			
Libya (1964)	36	20	7.2	3.5	32.3	100
Iraq (1957)	47.9	14.8	9.5	0.2	24.3	100
S. Arabia (1963) (a)	58 (c)	8	3	2	22	100
Kuwait (1965)	1	32.9	9.7	3.8	62.8	100
Lebanon (1968) (b)	34	21	45	100
Egypt (1964-5)	52	16	11		32	100
Jordan (1961)	35.3	21.5	8.4	2.4	24.8	100
Syria (1967)	58.1	13.7	9.0	0.4	22.9	100
Sudan (1956)	85.8	5.6	5.0	—	7.3	100

(1) Agriculture, forestry, hunting and fishing.

(2) Manufacturing, mining, quarrying, electricity, gas, sanitary services and construction.

(3) Commerce, transport, storage, communication and other services.

(a) estimate, in which all public sector has been included in the tertiary sector.

(b) estimate.

(c) includes an estimated 20% nomads.

Sources : I.L.O. *Yearbook of Labour Statistics*, 1966 ; UNESOB : *La Croissance Economique*, op. cit, pp. 84-5 & 229 and U.A.R., Central Agency for public Mobilization and Statistics : *Statistical Indicators*, Cairo, July 1966, p. 25.

TABLE II. Labour Productivity⁽¹⁾ in Manufacturing and Agriculture (Dollars per Labourer)

Country	Year	(1) Manufacturing	(2) Agriculture	(3) Ratio(1):(2)
S. Arabia	1962-3	1563	601	2.60
Iraq	1958	719	273	2.63
Jordan	1961	588	514	1.14
Kuwait	1966-7	4684	6230	0.75
Lebanon	1968	2021	618	3.27
Syria	1960	639	347	1.84
	1967	700	285	2.46

(1) Domestic product of each sector divided by the number of economically active in the same sector

Source : UNESOB : *La Croissance Economique*, op. cit. p.59.

The persistent predominance of the service sector as a contributor to GDP (together with oil) and as a source of employment (together with agriculture) is of course nothing unusual for underdeveloped countries. Professor Kuznets has shown that the average share of services in GNP could be a little less than 50% in countries with per capita income of less than \$220 annually and that its share at this level of income is higher than its share in countries with per capita income of \$575 or more. (1) In the Arab world, as in other underdeveloped countries, the main reason is the relatively few employment opportunities elsewhere. However, in Jordan, Syria and particularly in Lebanon (2)

(1) The average shares of the service sector in GNP in 59 countries in 1958 were as follows :

Per Capita GNP (\$)	100-199	200-349	350-574	575 or more
% in services in GNP :	45.6	43.2	51.3	43.7

Kuznets, S. *Modern Economic Growth*, Yale University Press, 1966, pp. 402-3.)

(2) One writer has estimated that in Beirut there is one merchandise retail store for approximately every 125 persons, and another mentions as a conservative estimate that about 60% of Beirut's ground floor are in commercial or industrial use. (Eid, N.: Merchandise Retailing in Lebanon, *Middle East Economic Papers*, 1969, p.21 and UNESOB : *Environmental Implications of Urban Settlements : Issues of Urban Ecology in the Middle East*, Beirut, 1971, (mimeo.), p.11)

the share of services in GDP is distinctly higher than the corresponding average share in other countries with the same per capita income. One must therefore look for reasons other than the usual one of the limited employment opportunities in agriculture, industry and mining. Among these are the relatively large defence establishments in Jordan and Syria, the high relative importance of tourism in Lebanon and Jordan, of financial services in Lebanon and of the government sector in Syria, the influx of the Palestinian refugees who found little employment opportunities in the commodity sectors, and what appears to be a special talent for acting as middlemen, especially among the Lebanese.

In Lebanon an unusually high proportion of the output of the service sector is sold to foreigners⁽¹⁾. An increase in the demand for services in Lebanon is, therefore, to that extent, a reflection of rising incomes outside rather than within Lebanon. The Lebanese economy will also to the same extent, remain vulnerable to economic and political fluctuations outside its borders. Moreover, foreign demand for Lebanon's services is of high elasticity and highly sensitive to policy moves taken by neighbouring countries, such as the restriction on travel to Lebanon, the closing of borders with Syria or Jordan or between the latter two countries. At the same time, Lebanon's ability to retaliate is quite limited since other Arab countries are less dependent on Lebanon as a market for their exports than Lebanon is on them.⁽²⁾

(1) As much as 36% of the output of the Lebanese service sector in 1965 was estimated to have been sold to non residents. The corresponding percentage for transport and communications was 20%, housing 25%, tourism 65% and imports 33%. (See Sayigh, Y. and Atallah, M. : *A Second Look at the Lebanese Economy*, Dar Al-Taliaa Beirut, 1966 (Arabic), pp. 16-26). According to another estimate almost one third of Lebanon's total personal income during 1961-65 could be attributed to tourists' expenditure, transport of goods and persons *across boundaries* (excluding purely internal transport), transit, entrepot and triangular trade, emigrant remittances and capital transfers, all of which are largely governed by factors beyond Lebanon's control. (See Badre, A. : *Economic Development of Lebanon*, in Cooper & Alexander (eds), op. cit., p. 191).

(2) See Khalaf, N. : *Economic Size and Stability of the Lebanese Economy*, *Middle East Economic Papers*, 1967, p. 72.

On the effect of trade on Lebanese morality, Professor Y. Sayigh writes :

«In this trade-centred society, cleverness enjoys a premium over creativity. The emphasis on gains made through clever bargaining is greater than the emphasis on steady business relations and on deals based on the respective merits of the goods exchanged. And the search for a quick turnover and large easy profits accentuates an inclination to speculative enterprise and militates against sustained effort and long-term investment promising long-term though low profit rates.» (*Entrepreneurs of Lebanon*, Harvard University Press, Cambridge, Massachusetts, 1962, p. 11).

4.—The Balance of Payments

Taken as a whole, total exports of Arab countries have been rising at a rate considerably higher than that of underdeveloped countries. This has been partly due to the high rates of growth of the exports of Lebanon and Jordan (which in Jordan's case is almost exclusively due to phosphates), but was mainly due, of course, to the rapid increase in international demand for oil. If oil was excluded the average rate would fall below that of underdeveloped countries taken as a whole. (1) Thus, while the oil countries continue to realize a big and increasing surplus in their balance of trade and, with the exception of Iraq (2), also in their balance of current accounts, all the non-oil countries continue to realize trade deficits. (3) The deficit is relatively small in the Sudan, and if the proceeds from invisible trade in the case of Syria (mainly from oil-transit and tourism) are added, the deficit declines heavily and may in some years turn into a small surplus. The most serious trade deficits are, therefore, those of Lebanon, Egypt and Jordan.

Lebanon's increasing trade deficit is turned into a surplus by invisible exports (mainly transit trade and tourism) and by the flow of private capital, especially from the oil countries. But the dependence of Lebanon's balance of payment on the inflow of private capital is at least as precarious as her dependence on trade and tourism. In the first place, most of the inflow of capital into Lebanon (about two thirds in 1964-5) (4) consists of short-term bank liabilities which can be withdrawn on demand. Secondly, a good part of capital movements consists of emigrants' remittances as well as flight capital from other Arab countries. While the former is dependent both on the number of Lebanese emigrants admitted by foreign countries and the degree of their continued attachment to Lebanon, the latter could decline if Lebanon's political or financial stability is threatened, or alternatively, if the political climate or investment op-

(1) During 1960-67 the average annual rates of growth of the value of commodity exports were as follows: Libya 90%, Lebanon, 15.3%, Jordan 16%, Saudi Arabia 11.6% Kuwait 5.6%, Iraq 5%, Egypt 1.9% and Sudan 1.6% (*Pearson's Report*, op. cit., p. 369).

(2) Though a trade-surplus country Iraq's balance of trade has been much less favourable than those of the other oil countries. During 1960-67 the rate of increase in her exports was not much higher than the average rate for underdeveloped countries as a whole (5% and 4% respectively) and in contrast to the other three oil countries her surplus on the balance of current account sometimes declines to quite a low level or turns into a deficit.

(3) see Table (12)

(4) Azhari, op. cit., p. 63. See also Khalaf, N., op. cit., pp. 72-3.

portunities in other Arab countries improve. The oil-rich countries may also discover one day that it is more profitable in the long-term to invest more of their surplus revenue at home or directly in Western Europe or the U.S. without passing through Lebanese banks as intermediaries. This was clearly shown by the repercussions of the Intra Bank crisis of 1966 and of the June war in the following year.⁽¹⁾

In both Egypt and Jordan the surplus on invisibles (mainly the Suez Canal in Egypt and tourism in Jordan) normally covers no more than one third of the trade deficit, and for the rest they both rely mainly on foreign aid. In place of a regular, though small, trade surplus which Egypt used to realize before World War II a trade deficit came to be the normal feature of her balance of payments and went on increasing until it reached L.E. 110 million in 1965. It was reported that in the following year the government had to sell one-third of the gold reserves to pay for current imports.⁽²⁾ In Jordan, despite the high rate of increase in exports, imports rose so much faster that her trade deficit multiplied more than 6 times between 1960 and 1966. By 1967 Egypt and Jordan came to have two of the highest external public debts per capita among the

(1) Largely as a result of the rise in U.S. and European interest rates in the second half of 1966 rose to levels which had never been reached since the early 1920's, the Lebanese banking system faced a sudden rise in the demand for foreign currencies and was put under strong pressure to increase its purchases of foreign funds. The big drain on the banks' reserves in high-powered money brought the ratio of reserves to demand deposits from a peak of 13% in May to a low of 10% in September 1966, a fall of 23%. The situation was made worse by the usual practice of several Lebanese banks of holding long-term claims in unsafe proportions, by the traditionally liberal attitude of the Lebanese System towards reserves and by the absence of defined legal reserve ratios. All this culminated in the collapse of the Intra Bank, the largest commercial bank in Lebanon, in October 1966, which was followed by a flight of capital out of Lebanon and a painful fall in the deposits held by local banks. Lebanon's image of financial security was again impaired by the June War, by the Israeli raid on Beirut airport in 1968 and by the border clashes between Israel and the Palestinian guerillas. While in 1966 the net inflow of capital to Lebanon was L.L. 355 million, in 1967 it fell to L.L. 79 million, making Lebanon unable, for the first time, to cover her deficit on current account. A balance-of-payment deficit of L.L. 1.9 million was thus realized in 1967 compared with a surplus of L.L. 96.5 million in the previous year. The situation would have been much worse if the same events had not also caused a heavy decline in imports and hence in the trade deficit.

(On the Intra affair see : Ghattas, E. : Lebanon's Financial Crisis in 1966, A Systemic Approach, *Middle East Journal*, Winter 1971; Azhari, *op. cit.*, pp. 93-4; Badre, in Cooper & Alexander (eds.), *op. cit.*, p. 204 and Sayigh and Attallah, *op. cit.*

(2) Kanovsky, E. : *The Economic Impact of the Six-Day War*, Praeger, N.Y., 1970, p.253.

underdeveloped countries. They were also among the worst situated with regard to the ratio of public external debt to commodity exports⁽¹⁾ and in Egypt's case, with regard to the ratio of service charges on public debt to export earnings.⁽²⁾

Oil producing or not, all the nine countries except Syria are food-deficit countries. This applies even to Iraq and the Sudan, the richest two countries in agricultural resources relatively to population. Iraq's food imports are now equal to the value of all her non-oil exports, while Jordan's *net* imports of foodstuffs were greater in 1966-68 than all her exports put together. Depending on the amount of rain, Syria alternates between being a food-surplus and a food-deficit country and when the deficit does occur it is usually small. Her food surplus, however, has been decreasing.⁽³⁾

Yet available data on food consumption, which is presumably more reliable and hides a smaller degree of inequality than per capita income figures, shows that in the mid-1960's the average diet was still deficient. With regard to quantity only in Egypt and Syria did calorie intake exceed requirements, but in most cases the deficiency was not great. As for quality, physiologists recommend a daily intake of total protein per head of 1g/kg of body weight for adults (about 70 grams) and 2 to 4 times as much for infants and children. Half of this amount is recommended to be of animal origin⁽⁴⁾. Table (14) shows that in all the nine countries the requirements of total protein were met but not that of animal protein⁽⁵⁾.

(1) Sharaiha, *op. cit.*, pp. 101-6.

Sudan's burden of external debt is much lower. Compared with a per capita external public debt of about \$60 for each of Egypt and Jordan on the 1st January, 1968, that of the Sudan was about \$20. Again, compared with a ratio of total external public debt to the value of commodity exports in 1967 of more than 3 in both Egypt and Jordan it was between 1 and 1.5 in the Sudan, (UN. : *The External Financing of Economic Development* (1963-67), N.Y., 1969, pp. 111-3.

(2) In 1967 Egypt debt-service payments absorbed about one third of her export earnings compared with about one fifth in the case of India and Pakistan. Only four of 68 countries for which data is available (namely Argentina, Tunisia, Brazil and Mexico) had higher ratios than that of Egypt. (*ibid.*, p. 115)

(3) see table (13)

(4) Amin, G. : *Food Supply and Economic Development, with Special Reference to Egypt*, Cass, London, 1966, p. 58

(5) It is worth noting that in Egypt, for whom food consumption data exists for a relatively long period, the quality of the average diet as measured by the intake of animal protein seems to have remained remarkably unchanged since the late 1940's although total protein intake indicates some improvement (FAO : *Production Yearbook*, 1970).

TABLE 12.—Balance of Trade and Export-Import Ratios
(Annual Averages)

	Balance of Trade (Millions of National Currencies)			Export-Import Ratios ⁽¹⁾		
	1954-5	1963-4	1968-9	1954-5	1963-4	1968-9
Kuwait	135(a)	344	360(b)	400(a)	398	294(b)
S. Arabia	1507	3691	5731	378	391	324
Libya	-9	76	485	33	176	305
Iraq	95	159	221	215	224	247
Sudan	-3	-24	-7	93	75	92
Lebanon	-327	-705	-1134	22	21	30
Syria	134	-200	-557	134	77	57
Egypt	-31	-176	14	82	57	105
Jordan	-21	-45	-48	12	14	23

(1) Commodity exports as a percentage of commodity imports.

(a) average 1958-9

(b) average 1966-7

Sources : calculated from U.N. : *Yearbook of International Trade Statistics*, 1969; UNESOB : *Studies on Selected Development Problems*, 1970, pp. 14-7 and El-Mallakh, *op. cit.*, p. 24.

TABLE 13.—Food⁽¹⁾ Imports and Exports

Country	Period (annual Averages)	Total Imports	Imports of Food & Live Animals	% of Imports of Food and Live Animals	Exports of Food and Live Animals	Food and Live Animals Deficit
Jordan (mill. Dinars)	1954-5	24	8	33.3	1	7
	1966-7	62	16	25.8	4	12
Sudan (mill.L.S.)	1954-5	49	13	26.6	4	9
	1968-9	91	14	15.4	8	6
Iraq (mill. ID.)	1954-5	85	15	17.6	14	1
	1968-9	151	22	14.6	9	13
Kuwait (mill.KD.)	1968-9	224	35	15.6	3	32
Syria (mill.L.S)	1954-5	387	52	13.4	175	-123(a)
	1968-9	1281	224	17.5	238	-14(a)
Lebanon (mill.L.L.)	1954-5	429	141	32.9	51	90
	1967-8	1621	357	22.0	153	204
Libya (2) (mill. L. L.)	1955-6	15	4	26.7	1.05	3
	1968-9	236	29	12.3	.05	29
Egypt (2) (mill. L, E.)	1955-6	184	24	13.0	15	9
	1967-8	317	96	30.3	54	42
S. Arabia (mill. S.R.)	1966-7	2235	679	30.4	8	671

(1) unless otherwise stated includes also beverages and tobacco

(2) does not include beverages and tobacco.

(a) food and live animal surplus.

Sources : U.N. : *Yearbook of International Trade Statistics* 1958 & 69 and Kingdom of Saudi Arabia, Ministry of Finance and National Economy : *Statistical Yearbook*, 1969.

TABLE 14.—Calorie and Protein Intake (1964-66) (Per capita per day)

Country	Calorie Intake (number)	Calorie Requirement (number)	Caloric Intake as % of Requirement	Total Protein Intake (grams)	Requirement of Total Protein (grams)	Total Protein Intake as % of Requirement	Intake of Animal Protein
Lebanon	2360	2425		70	57		20
S. Arabia	2080	2225		56	50		9
Sudan (a)	2090	2185		59	59		19
Syria	2450	2390		69	63		12
Egypt	2960	2380		76(b)	64(b)	(b)	11(b)
Jordan	2400	2425		65	64		11
Iraq (c)	2050	2245		59	55		14
Libya	2540	...		64	...		18

(a) Data relate to area covering 87% of the population. (b) Provisional data for 1966-67 (c) Provisional (...) Not available
 Sources : actual intake from FAO : *Production Yearbook*, 1970, requirements from Stickley, S. & others (eds.) *Man Food and Agriculture in the Middle East*, American University of Beirut, 1969, p. 23.

5.—Arab Economic Integration

Over the last two decades Arab statesmen as well as Arab economists rarely missed a chance of referring to the advantages that could be realized from Arab economic integration. Until 1964, however, Arab countries could only achieve the conclusion of preferential trade and payments agreements, mainly bilateral, which had very limited effect on the size and structure of inter-Arab trade. The exemption from customs duties included in these agreements applied mainly to agricultural commodities which had either already been exempt from customs duties before the agreement, or had been subject to negligible tariffs. The fact that virtually all the agreements were of only one-year duration discouraged private entrepreneurs from drawing their investment plans on the basis of a market wider than that of their own country.⁽¹⁾ Annexes were often added to the agreements, including long lists of products to which the exemption from tariffs would not apply, while the agreements were usually silent with regard to the exemption from import licenses, quantitative and foreign exchange restrictions. The whole agreement was in any case liable to be ignored once the political relations between the two parties became strained. Thus between 1951-3 and 1962-3 the share of inter-Arab in total Arab trade increased only slightly, and in some cases as those of Jordan, Lebanon and Syria, it even declined.⁽²⁾ The main exception during this period was the bit increase in the trade between Egypt and Syria during their union (1958-61) whereby Syria's imports from Egypt in 1961 was more than five times their level in 1957.⁽³⁾

In 1964 an agreement was reached between five Arab countries : Syria, Iraq, Kuwait, Jordan and Egypt to establish an «Arab Common Market». Two more countries later signed the agreement : Yemen in 1967 and the Sudan in 1969. On paper the agreement was extremely ambitious. Obviously imitating the European Economic Community it aimed not only at the removal of trade barriers but at the ultimate establishment of a common tariff vis-à-vis the outside world, the free movement of labour and capital, a uniform agricultural, industrial,

(1) Diab, M. : *Inter-Arab Economic Co-operation, 1951-60*, Economic Research Institute, American University of Beirut, 1963, p. 88.

(2) See UNESOB : *Studies on Selected Development Problems*, 1967, p. 16 and Al-Ghandour, A. : *Arab Economic Integration*, (Arabic), Institute of Arab Studies, Cairo, 1970, pp. 110-123.

(3) Kanovsky, E. : Arab Economic Unity, *Middle East Journal*, Spring 1967, p. 215,

commercial and monetary policy ... etc. The agreement came into force on 1st January, 1965, but in July of the same year Kuwait's National Assembly voted to withdraw and later the Sudan was permitted to delay the implementation of the agreement until the beginning of 1972 and Yemen to become merely «an observer».(1) Only four countries therefore are now bound by the agreement : Iraq, Syria, Jordan and Egypt.(2) All the four countries continued, however, to apply quota restrictions, so that the Arab League's Economic Unity Council had officially to recognize their right to do so, merely obliging the country «forced by its circumstances to apply quota restrictions to give preference to the products of other member countries within the country's own productive and export capacities».(3)

TABLE 15.—Share of Intra - A.C.M. In the Total Trade of Arab Common Market Countries (Percentages) (1)
1958 — 1969

Year	Exports	Imports
1958	5.1	3.5
1959	8.8	4.7
1960	6.7	3.7
1961	8.0	3.9
1962	3.7	1.8
1963	4.2	2.4
1964	3.8	2.0
1965	3.4	2.0
1966	4.5	2.1
1967	4.3	2.2
1968	5.9	3.2
1969	6.2	3.9

(1) Value of exports / imports of Iraq, Syria, Jordan and Egypt to each other as a percentage of their total exports / imports.

Source : UNESOB : *Etude Comparative des Cadres Institutionnels du Commerce Intra-Marché Commun Arabe*, (mimeo), June 1971, tables 16 & 17.

(1) *Al-Ahram*, 17.3. 1971.

(2) Lists of goods were submitted by these countries requesting their exemption from the elimination of customs duties. These requests were later withdrawn except for some of Jordan's (*ibid*).

(3) The Council's decision no. 251, 6.11. 1966, quoted by El-Ghandour, *op. cit.*, p. 123.

Table (15) shows that the share of trade between the four countries in their total trade has risen quite rapidly after 1964 but that this share is still very low especially with regard to imports. For obvious reasons these countries rely more on each other in disposing of their exports than in acquiring what they need of consumer or capital goods. Between 1960-64 and 1965-69 the total five-year value of the imports of the four countries increased by \$ 989 million of which only 22 million was due to the increase in intra-Arab Common Market trade compared with an increase of 251 million in their imports from the E.E.C. countries and of 942 million from the Sino-Soviet bloc.(1)

But even with regard to exports, it is unlikely that the removal of trade barriers will, by itself, increase the ratio of inter-Arab to total Arab exports beyond a modest level. As long as Arab exports continue to consist mainly of primary commodities they will continue to rely on the markets of industrial countries. Moreover, their reliance on the importation of capital and consumer goods from these countries will tend to favour the directing of these primary exports to them, as is the case at present.(2) In fact, given the existing structure of production in Arab countries, an operative customs union may prove disadvantageous to most of them, a fact which helps to explain their laxity in bringing it into effect. While an effective Arab customs union is of little use to the oil countries, as an outlet for their oil exports, these countries would have to replace their imports of Western goods by inferior Arab products.

(1) UNESOB : *Etude Comparative des Cadres Institutionnels du Commerce Intra-Marekê- Commun Arabe*, (mimeo.), June 1971, pp. 18-9.

(2) Partly because the structure of their exports has shown little change but also for political reasons, Arab countries continue to rely heavily on the market of one or a few countries. Thus while the exports of Egypt and Syria are now heavily oriented towards the Soviet Union, most of the oil exports go to Western Europe and Japan. The change in the destination of Egypt's and Syria's exports since the mid-1950's resulted not in the diversification of their export markets as much as in replacing one predominant market by another. While in 1948, 29% of all Egyptian exports went to Britain and another 24% to other West European countries and only 13% to Eastern Europe, in 1968-9 the shares were reversed to 49% to Eastern Europe and China, and 21% to all of Western Europe including Britain. Similarly, while Syria exported almost nothing to the socialist countries in 1953, their share rose to 41% in 1964. In both cases, exports to the Eastern bloc consist mainly of cotton.

Of the nine Arab countries, only Jordan, Syria and Lebanon export a high proportion of their total exports to other Arab countries, the average for 1968-9 being 69% 60% and 35% respectively, (U.N. *Yearbook of International Trade Statistics*, 1969.)

The oil countries may rightly fear that they would in fact be subsidizing other Arab countries suffering from foreign-exchange shortages while others, particularly Jordan, could fear the loss of customs duties which constitute the government's main source of revenue. For all except the most industrially advanced, the gain from a more efficient reallocation of existing industries is likely to be small when compared with the likely increase in unemployment especially if one is to consider the scarcity of capital in many of them and the difficulties of retraining labour and providing economic and social facilities for new industries. It is difficult to imagine or indeed to justify, that Syria or the Sudan should close down some of their textile factories and tolerate more unemployment simply because the Egyptian textile factories are more efficient. Even if the liberalization of trade increases total and per capita income in each of the Arab countries, the less-developed among them may still give their lower rate of industrial growth a greater weight than the increase in their total income.⁽¹⁾ The danger of polarization is further aggravated by the fact that the distances between the levels of industrial development and infrastructure in Arab countries are far greater than those existing between any two members of EEC or EFTA. All this is presented not as an argument against the liberalization of Arab trade but merely to point out its insufficiency. The real advantages of economic integration among underdeveloped countries stem not from the freeing of largely non-existing trade but from its promotion, from its role in promoting new industries rather than in allowing a more efficient allocation of existing ones. Such an aim would require that co-operation should extend to the sphere of production and investment, to the establishment of mutually complementary industries which would be distributed among member countries in accordance with their resource endowments.⁽²⁾ Only through such co-ordination could the disadvantages just referred to be avoided or outweighed by greater benefits. Thus, while a common external tariff could by itself only harm Lebanese traders, it could, if coupled with a common Arab development policy, be beneficial to

(1) For an elaboration of this point see Andic, F., Andic, S. and Dossier, D. : *A Theory of Economic Integration for Developing Countries*, Allen & Unwin, London, 1971, pp. 17-8.

(2) See; Kitamura, H. : Economic Theory and the Economic Integration of Underdeveloped Regions, in, Wionczek, M. (ed.): *Latin American Economic Integration* Praeger, N.Y., 1966, p. 57 and Mikesell, R., The Theory of Common Markets and Developing Countries, in Robson, P. (ed.) : *International Economic Integration*, Penguin Books, 1971, p. 174.

Lebanon's industrial and agricultural expansion. Similarly, while a wider Arab market may bring little benefit to oil exports, it may be a necessary condition for the expansion of petro-chemical industries. Most Arab governments, however, have shown little inclination to relegate part of their power to a common authority or to sacrifice the economic interests of strong minorities for the sake of long-term industrial growth. No attempt was therefore made to harmonize Arab development plans in such a way as to avoid unnecessary duplication. When Iraq, Kuwait and Saudi Arabia, for example, recently embarked on establishing petro-chemical and fertilizer plants, no attempt was made to co-ordinate their plans in this field so that each of them is likely to face the competition of the other two in their efforts to market their output. All of them, however, continue to pay lip service to the cause of economic integration and, in order to pacify the Arab nationalists among their subjects, formally adhere to largely ineffective agreements.

It is indeed ironic that the only genuine examples of economic integration between Arab countries, other than that which accompanied the political union between Egypt and Syria (1958-61) have been imposed upon Arab countries by a foreign power. Such, for example, were the customs union among most Arab countries which lasted between 1870 and 1941 under the Ottoman Empire, or the Middle East Supply Centre which co-ordinated their production and trade under British domination during the second world war, or the customs union between Syria and Lebanon, established by the French administration between the two world wars, which provided protection for Lebanese as well as Syrian manufacturing but was dissolved soon after the two countries achieved their independence.⁽¹⁾

(1) For a detailed account of these earlier examples see Musrey, A. : *An Arab Common Market : A Study in Inter-Arab Trade Relations, 1920-67*, Praeger, N.Y., 1969.

« PLANNED SURPLUS » for Economic Development
A Note on the Price Policy for Electric
Power from the Aswan High Dam

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Hick's greatest contribution to the concept of consumers' surplus is that he saved it from collapse when the cardinal utility analysis was superseded by the ordinality of indifference curves (1). For all practical purposes, we feel that he achieved only a finesse of theoretical perception, but failed to present a «practical» measure. The Marshallian triangle retains its practicality as a meaningful measure amenable for empirical treatment of issues of policy (2).

There are several examples of utilizing the concept of «surplus» for economic policy. Deputies' case, in 1844, of the «dead loss» of excise tax is one of the earliest.(3) Expanding on this argument, H. Hotelling suggested that sources of finance for construction of public utilities should be a tax system which would minimize the «dead loss» for society.(4) Professor G. Tintner advocated the use of consumers' surplus for economic evaluation of projects.(5) This was empirically applied in a previous work by the present author. (6)

(1) J.R. Hicks, «The Rehabilitation of Consumers' Surplus,» *Review of Economic Studies*, Vol. VIII, (1941), pp. 108-116; «The Four Consumers' Surpluses» *Review of Economic Studies*, Vol. XI, (1943), pp. 31-41; «The Generalized Theory of Consumers' Surplus», *RES*, Vol. XIII, (1945), pp. 68-74.

(2) For a full appreciation of the defense for the Marshallian measure, see by the present writer, *The Surplus Approach For Project Appraisal*, A Doctoral Dissertation, USC, 1966, pp. 58-78.

(3) R. Frisch, «The Deput Taxation Theorem», *Econometrica*, 1939.

(4) H. Hotelling, «The General Welfare in Relation to Problems of Taxation and of Railway and Utility Rates,» *Econometrica* (July 1938).

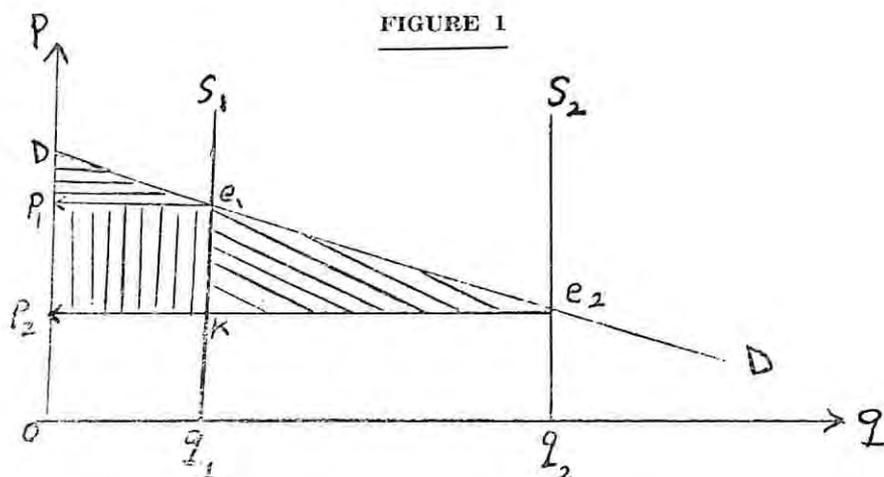
(5) G. Tintner, *The Econometrics of Development and Planning*, (First Draft, 1966) pp. 500-505.

(6) See for the author, «The Surplus Approach for Project Appraisal» a Doctoral Dissertation, USC, 1966; G. Tintner and the author «Economic Appraisal of the Aswan High Dam : A New Approach,» in *Festschrift Fur Walter George Waffenschmidt zur Vollendung des 85. Lebensjahres*, (Verlag Anton Hain. Meisenheim am Glan), pp. 181-190.

Our purpose in the present work is to advocate the use of the concept as a policy instrument for enhancing economic development. The presentation is made with reference to the pricing policy for electric power in Egypt. The idea was brought up by a critical observation : That keeping price per unit of electric energy—after the completion of the Aswan High Dam—at the level which existed before its construction, could not be justified on social and economic grounds. (1) The argument presented here is essentially theoretical, and further quantitative research would be advisable to establish a concrete basis for the conclusions (2).

One of the major outcomes of the implementation of the Dam is the tremendous increase in the supply of hydroelectric power for the Egyptian economy.(3) We shall here attempt to analyse alternative possibilities, and to suggest accordingly what we consider a proper price policy for electric energy in different stages following the establishment of the project.

In figure (1), the supply and demand curves for electric power before



(1) After writing a first draft of this paper, the Egyptian authorities decided on a price reduction. We had to perform a radical change in the analytical framework to take this decision into account.

(2) In the future we hope to be in a position—concerning availability of the data—to estimate a demand curve for electric power, and to calculate the surplus at several alternative prices.

(3) It is estimated that The High Dam generates twice as much electric energy as existed before its construction. It is also supposed that in ten years a similar number of power-units would be installed, and the Dam would then account for eight-tenths of all electric power supplied to the Egyptian economy.

the project are denoted by $s_1 q_1$ and DD, respectively. Their intersection determines (P_1) the equilibrium price, and (oq_1) the equilibrium quantity of kilowats of electric power consumed. A direct outcome of the construction and operation of the power-generating equipment of the dam is a substantial rightwards shift in the zero-elastic supply curve, say from $s_1 q_1$ to $s_2 q_2$. Here we would be faced with one of the following possibilities. :

First : The demand does not change : No shift in the DD curve :

This case is the most likely in the early years directly following the completion of the project. The increase in demand for electric power, in both business and household sectors, depends on growth factors, i.e. occurrence of basic structural changes and developments in the economy which are not supposed to happen spontaneously with the mere creation of the project. These would include population growth, relative increase in the advancement of urban areas: new patterns of life and modernization in rural areas: basic shifts in the patterns of consumption, (1) considerable industrial expansion; basic technological advance... etc.

In such an early stage we can easily visualize, as figure (1) indicates, that the failure of public authorities to reduce the price from its original level p_1 has two adverse effects :

1.—A loss in consumers' surplus, the size of which depends on the extent of the shift in the supply curve. In figure (1), the loss is represented by the difference between the areas of the two triangles $De_2 p_2$ and $De_1 p_1$, i.e., the area $p_1 e_1 e_2 p_2$. This is evidently a net loss to the «consumers», besides, a substantial part of it is lost for the economy as a whole; (2) i.e., the area $e_1 e_2 k$ in figure one.

2.—Since the quantity of non storable electric energy supplied is oq_2 , the use of oq_1 only, as a result of arbitrary price setting, at its original high level of p_1 , means a waste of the quantity $q_1 q_2$; an amount which is obviously lost for the economy after being actually generated. (3).

1) Towards more intensive and expansive use of electricity-operated durable goods and appliances.

(2) The size of this part depends on both the elasticity of demand and the increase in supply. It is presumed that the demand for electricity is fairly elastic.

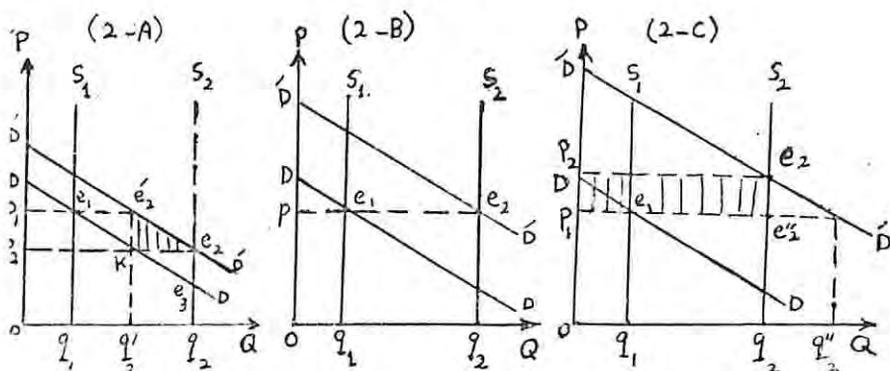
(3) We will have a comment on this point at a later stage.

Second : The Demand increases : A rightward shift in DD curve :

The present case is most likely to occur in later years, after a period of time long enough to allow growth factors to work their way out in the economy. Under these circumstances, we need to compare the extent of shifts in the demand and the supply curves, in order to determine the new level of equilibrium price. And here we would have one of the three possible situations :

1.—The new situation might indicate a decline in equilibrium price (figure 2 - A). In this case, the analysis will be similar to that of the previous case (i.e., loss of surplus) with two slight differences in degree :

FIGURE 2



- (a) The new equilibrium price will be higher than the level p_2 of the previous case. But even so, it would not be advisable to maintain the price at the original level of P_1 ; fixing it arbitrarily at that level reduces the surplus from $D' e_2 P_2$ to $D' e'_2 P_1$, with a loss being equal to the area $P_1 e'_2 e_2 P_2$. (1).
- (b) Moreover, the economy would forego the use of the quantity $q'_2 - q_2$ of non storable electric energy. This is again an obvious waste, and a net loss to the economy as a whole. (2)

2.—The second possibility, represented by figure (2 - B), is that the new equilibrium price remains unchanged. This would occur only in the case where shifts in demand are just enough to make the point of

(1) With a part of it, $e_2 e'_2 k$, completely lost for the economy as a whole.

(2) This again is a smaller quantity of waste than the previous case.

intersection (e_2) with the new supply at the same level of (e_1). This is clearly a very special case and the possibility of its occurrence is somewhat remote ⁽¹⁾. Although this might be the case on which pure theoretical analysis justifies maintaining the price at its original level, we will later present important reservations against this argument.

3.—The third possibility, represented in figure (2 - C), is that the rightward shift in the demand curve will be to the extent that the new equilibrium occurs at a level of price higher than p_1 . From the purely *theoretical* point of view, it would be wrong not to raise the price from its original level; keeping it at p_1 would encourage wasteful increase in the use of electric power. Although the amount actually used will never exceed the fixed quantity oq_2 , the distance $q_2 q_2''$ on the horizontal axis symbolizes the strength of the tendency towards this wasteful consumption, with the effect of misallocation in the use of electric power, preventing the maximization of its benefits.

If the price is not raised to its new equilibrium level, figure (2-C) would show that the consumers' surplus will be equal to the area $De_2e_2''P_1$ with an «extra surplus»⁽²⁾ equal to the rectangular area $P_2e_2e_2''P_1$. Its disadvantage lies in being associated with a non-equilibrium price p_1 which distorts the true relative scarcity of electric power. There is a direct relationship between the area of the rectangle representing the «extra surplus» and the degree of price distortion.

The preceding discussion leads to the conclusion that under the conditions of an unplanned economy, and where our main sectors are supposed to be household and private business sectors, the pricing of, say, electric power in a major project, even if run by private business, should follow the following policy :

1.—In the early stages following the establishment of the project, the price should be reduced, otherwise a net economic loss — of surplus and waste of energy — would be incurred by the economy as a whole,

2.—In later stages, the price may be kept constant, reduced, or raised above its initial level :

(1) Even if the possibility occurs by a mere chance, there is not a strong reason to assume nonalteration of this situation, even for a short duration.

(2) This term is used here for the first time to denote a part of the surplus, which is not defined by the three boundaries derived from Marshall's definition; namely the demand curve, the price level, and the Y axis.

- (a) The possibility that the objective economic conditions will justify keeping the price at its original level is a remote one; and even if it occurs by chance, this cannot be a permanent situation.
- (b) If the economic conditions call for price reduction, but price fails for any reason to decline, three conspicuous economic losses are pertinent :
- i Consumers of electric power will incur a loss in consumers' surplus.
 - ii The whole economy will incur a similar - albeit smaller - net loss in surplus.
 - iii A part of the electric energy will not be utilized, and this is another important side of the economic loss.
- (c) Finally, if the objective conditions of supply and demand require price increase, but the price was kept at its original low level, an «extra surplus» will accrue to the consumers of electric power at the expense of the private business sector producing that energy (as if it is taxing it by an equal amount), so it will not be a net gain to the economy.

The Concept of Planned Surplus :

Since the emergence of the «extra surplus» - discussed above - is a result of some degree of price distortion, pure economic theory proclaims that it will have the effect of non-maximization of benefits from the use of electric power. Moreover, a deliberate reduction in price would result, in the case of private enterprise systems, in imposing a burden on the business sector which produces this type of commodity.

The picture, however, would be different if we consider the case of an economy which is more or less socialized, with its two main components being household sector and the public sector. (1) In such an economic system, the public sector, to which the basic industries and projects would belong, plays the leading role; it carries the responsibility to marshal the economy along the proper paths for economic development. It performs a vital influencing role for both present and future

(1) We do not disregard the fact that there will be also a small segment which is privately owned (and managed), but for our analysis, we combine this part of the economy with the household sector.

activities, i.e., from the point of view of planning for the achievement of specific targets of economic development and deliberate growth. (1)

Thus, the conclusion we have reached concerning the proper price policy for the early stage following the establishment of the project, will be necessarily as valid for planned economies as for free enterprise systems. The necessity of price reduction would be unquestionable from the point of view of deliberate planning for economic development, let alone the theoretical foundations of economic analysis.

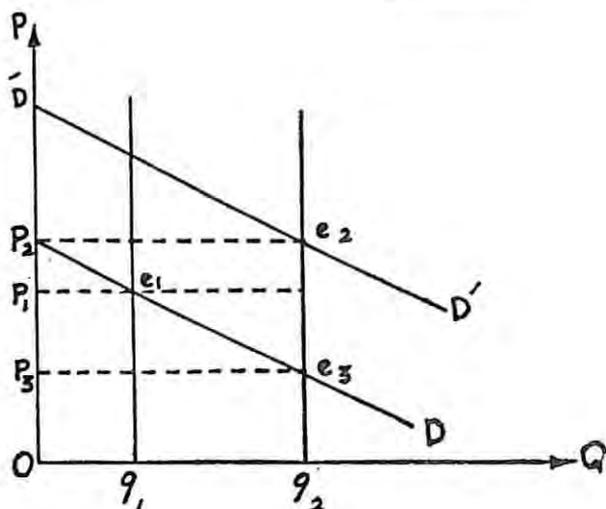
In later stages when growth factors will have had enough time to manifest themselves, causing a rightward shift in the demand curve, we would have good reasons, still, to advocate price reduction, even though conventional economic analysis may not sanction such suggestion. Thus the pricing policy of electric power in this stage should not be based on the common logic of market equilibrium, but rather on a criterion which we will name «planned surplus». The worst we may expect to happen, when the demand shifts rightwards, is the possibility of a new equilibrium price, higher than the initial level. (2) But even in this case, the public authorities would have genuine reasons to justify setting the price below the original price p_1 , fixing it even as low as p_3 (figure 3) :

It could easily be seen that, with such a policy the users of electric power (household and minor private business) would enjoy, say, a bonus of surplus, the burden of which is not shouldered by any «specific» group. This part of the surplus we prefer to indentify as «subsidy» carried on deliberately by the government, who is here economically oriented by the strategy of the nationally accepted overall plan for long run economic development. This is to say that the economy as a whole will be willing to incur the planned burden as the cost of expected returns of this «subsidy surplus». Obviously, this situation is different from the above mentioned case, where the burden of the «extra surplus» falls arbitrarily on private business.

(1) Price distortion would be viewed in this case as a minor flaw. See : R.C. Lippy and K. Lancaster, «The General Theory of Second Best», R.E.S., Vol. 24, 1956-1957, pp. 11-32. It is to be noted that we are not concerned here with static — but rather dynamic — efficiency. See also : E. J. Mishan, «Second Thoughts on the Second Best», Oxford Economic Papers, October 1962, pp. 205-277.

(2) The analysis of this case will be, a fortiori, relevant to the possibility of a new equilibrium price at the same original level.

FIGURE 3



To sum up, while in the case of a free enterprise system the burden of the «extra» surplus is unplanned and falls upon private business, the burden of the «subsidy surplus» is actually intended and appreciated in the case of a socialized planned economy.⁽¹⁾ This is supposed to be based on explicit and careful estimation of the cost - of price reduction, which should be compared with returns from this «subsidy surplus», which includes direct pecuniary benefit accruing to users, as well as indirect favorable effects on growth factors and environment. By «indirect effects» we mean the role of the «subsidy surplus» in initiating warranted changes and/or enhancing their pace, such as the trend towards modernizing backward regions; raising the standard of living in urban as well as in rural areas, and thus effectuating a halt to the population detrimental rates of growth⁽²⁾. In general, we might say that the

(1) That is why we differentiate between «subsidy surplus» and «extra surplus», indicating that the former is a deliberate policy measure, but the latter is not.

(2) W. Galenson and H. Leibenstein, investment criteria, productivity, and economic development, Q. J. E., 1955, pp. 343-370.

availability—at easy terms— of an intermediate commodity, like electricity, basic to the advanced economic life, is very effective, in the long run, for inducing backward environment to undergo faster transformation into a modern one, and to stimulate the traditional stationary culture to develop more progressive and dynamic institutions, which are essential factors — and features — of economic and social development.

Our discussion of a price policy for electric power in Egypt thus suggests that we should apply a social criterion which compares a «certain» planned extra cost to the economy in the form of «subsidy surplus» with direct pecuniary *plus* indirect social gains. (1) Using figure (3), we can show that the cost to the economy, as a result of the suggested policy is equal to the area of the rectangle $p_2 e_2 e_3 p_3$, whereas the gain from such policy is, at least, equal to the same area plus other favorable indirect effects on development and growth factors; in fact the latter effect might even exceed by far the direct pecuniary gain accruing to the household sector. Obviously then, the result would be a considerable net positive gain to the planned economy. Let us emphasize here that the gain is not limited to improvements in cultural, environmental, human, and social aspects; it certainly extends to structural economic relationships. All these together comprise what we might call «growth and development factors»: When favorable social, cultural, and demographic changes take place, they are expected to exert direct favorable effect on consumption patterns, saving habits, work attitudes, adopted technological methods,... etc, and, hence, on industrial expansion and development.

Some Further Considerations

Here we deal with certain points which may be raised against the proposed pricing policy for electric power, such as considerations of price stability, considerations of a possible gradual shift in the supply curve, and taking future needs of industrial expansion into account.

1.—Considerations of Price Stability :

It might be said for example, that maintaining the price of electric

(1) Since our inclination to choose this social criterion is due to the vital importance — to the economy as a whole — of the good under consideration — we think it should be applied to projects of similar nature.

power, in the early stage, at its original - pre Dam - level was a conscious policy to preserve its stability in the long run. The crux of the argument might be that if the price was reduced in the early stage immediately following the completion of the project, due to the relative redundancy in supply, it has to be raised up subsequently, due to later increase on the demand side.

To answer this argument let us recall that we have demonstrated that price cut is advisable in the early stage in order for the economy to get hold of a large feasible surplus. We have also shown that the reduction in price has its logical justification in a planned economy, even if conventional supply and demand analysis advises differently. Considering the policy which has been followed in pricing electric power until now, we feel that the above mentioned reasoning is turned upside down. There is no convincing explanation for such an inconsistent policy, i.e., keeping a high price in the early stage, and reducing it at a later stage. Making such price cut now, while failing to do so in the previous stage, could either be considered an haphazard decision inspired by non economic factors, or at best a correction of a mistaken price policy, which must have costed the economy a net loss of surplus, since the new electric power was generated from the High Dam.

Now we are in a position to grasp the futility of the argument for price stability; it does not necessarily justify maintaining a high price throughout.(1) On the contrary, and especially for a planned economy—establishing and enhancing necessary and possible furtherance of its growth and development—the proper policy to guarantee such stability is to stick to reduced prices all the way. (2) Initially this is justified from the point of view of both conventional supply and demand analysis, and the philosophy of «planned surplus» for furthering economic development. Lately it is justified on grounds of the second reason. This assures stability and consistency in price policy.

2.—Considerations of Gradual Increase in Supply of Electric Power :

The second point is related to the waste of electric energy generated; a point which constituted a part of our argument against the policy

(1) In fact, it does not seem that this argument for price stability could serve as the basis for the policy followed — until now — by the Egyptian price - policy maker

(2) Again we stress the necessity that price reduction in the later stages should be a carefully calculated action, the result of which should be an estimated benefit (direct plus indirect) which outweighs cost.

followed. In this regard some raise the possibility that setting a timetable for operating the power units would guarantee that no such waste will take place. This is tantamount to a policy which would not put all the units in operation immediately after being installed; instead some of them would be kept idle pending the actual realization of the expected increase in demand. In such a case—so the argument would say—there would be no waste in electric power, simply because it is not yet generated.

But this argument can provide neither a justification for not reducing price in the early stage, nor an explanation for reversing that policy by the recent price cut. This is only an assumption which does not change the shape or the final location of the supply curve. It merely indicates a number of successive small shifts—rather than a once for all shift—in the zero elastic supply curve. Thus :

- (a) Even with the minimum number of turbines being operated in the early stage, there will be a rightward shift in the supply curve. If price is not allowed to go down in such a case, the previous analysis and conclusions pertaining to this stage will not change in nature; the only difference is that the magnitude of the lost surplus will be smaller.
- (b) The policy of making deliberate gradual shifts in the supply curve is not economically sound. Once the power units are installed, it would be a waste in productive capacity to keep some of them idle. Besides, the economy would in this case miss the opportunity to realize, not only the maximum possible surplus out of an already existing capacity, but it will also forego the important indirect benefits relevant to growth and development.

3.— Considerations of Future Industrial Expansion :

This final point relates to what some proponents of the actual policy of the Egyptian authorities try to rationalize. They try to argue, that keeping the price above its new equilibrium level —after the shift in supply—would result in keeping consumption of electric power in check; and this would serve the purpose of reserving a good part of the energy for industrial expansion when the time comes. The argument - it seems - rests partly on the stability consideration discussed above, and whoever is convinced with the latter will, by necessity, adhere to the former.

Another line of reasoning for these proponents would be that if the price was set as low as equilibrium price—after supply shifts in the early stage— and assuming that the whole amount of energy is consumed, the only way to get hold of some energy for further industrial development, when the need occurs, will be to raise the price again. They are averse to the idea of pushing up prices, after being once reduced, because it implies deprivation of the community of something they already got.

This point of view seems untenable, and the results of which are somewhat queer. To keep the price as high as p_1 in figure (3) on the pretext that eventual, or potential industrial expansion requires such policy, defeats the purpose of economic development, and may result in delay of industrial development itself : First, it deprives the economy of the quantity q_1 q_2 of electric power, which is obviously wasted. Moreover, it deprives the economy of the «indirect benefits» of the «subsidy surplus», which are essential for creating the right milieu for expanding the «absorptive capacity»(1) of the economy, when industrial development is ignited.

The argument, that raising the price later would be hard on the community, is easy to dispose of. The «subsidy surplus» could be readily treated like any kind of subsidy. As long as the economic situation requires, the subsidy would be justified, and the economy bears its burden, but it is never supposed to be a permanent feature. It could—and actually should—be withheld as soon as the economy becomes no more in need for it. Enough that the economy would benefit from such subsidy at a certain period of time when it is needed. And it is a sort of economic nonsense to deprive the economy of such useful measure throughout, just because such measures might eventually be cancelled; most probably at a time when the need for it is very much less.

Conclusions :

We may now sum up our conclusions concerning the price policy for products of such a vital project like the Aswan High Dam, which provides the economy with a basic intermediate good, essential for its structural and economic development :

(1) See for that, B. Horvat, «The Optimum Rate of Investment», *Economic Journal*, Dec. 1958.

1.—The price should have been reduced from the start, even in the absence of any philosophy of planned development. Failing to do so had, no doubt, resulted in a net loss of «surplus» for the economy as a whole.

2.—With the philosophy of planned development, such project should play the important role of giving the economy a considerable push towards basic transformation through «planning a big surplus». This requires the continuation of the policy of a reduced price, even when demand for electricity increases in later stages.

3.—In the early stage, supply and demand mechanism may determine the extent of price reduction. But in the later stage they should cease to «determine», and serve only as a guide for the range in which policy makers are free to move. However, another criterion should be applied in order that the price reduction may not be administered haphazardly. It should rather be determined through careful economic calculations, the accuracy of which would depend on the ability to «approximate» the expected extra gain from a certain magnitude of «planned surplus». This would be the guarantee for adopting a price policy which is stable, logically and economically consistent, and capable of generating the maximum feasible surplus. This is, finally, a price policy which assures substantial indirect benefits, through a large and effective host of stimulants to growth factors and social transformation.

SYSTEMS ANALYSIS : AN OVERVIEW

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1. Introduction :

Systems analysis has become in recent years a fairly current term, a fashionable mode of enquiry, and a rapidly growing body of knowledge. Its application has led to such spectacular successes as the complex missions taking man and machine to the moon and back to earth with a high degree of precision and reliability.

The idea of a system however is really neither new nor exclusive to one discipline of knowledge. Such diverse things, for instance, as cells, engines, human beings, business organizations, markets, economic regions, governments, whole societies and international relationships have been described, predicted, steered, and/or designed as systems (See for example 3, 4, 5, 8, 10, 11, 14, 19, 25, and 26*).

Some of these «things» to which systems categories are applied are evidently much more complex than others. It is still to be seen for example if systems analysis can contribute significantly to the alleviation of such thorny problems as poverty, disease, crime, conflict, and pollution. The challenge that lies ahead seems to lie in the ability to devise analytical systems which can cope with given levels of complexity in the real world.

The purpose of this paper is to outline what systems analysis is; furnish some of its generic concepts and procedures of analysis and control; and indicate some of its limitations and potentials.

Any exposition of this vast and somewhat controversial area must be necessarily selective. Our aim is to present a broad framework of systems analysis in which some specific and narrow but well-known connotations of systems analysis appear as special cases. A special type of system, the cybernetic system, will also receive special attention.

* Bracketed numbers throughout the text are literature citations. Thus 10 : 5 for example means item ten in the selected bibliography provided at the end of this paper, page five.

The Concept of a System

A system is a model by which we improve our understanding of some phenomenon and/or achieve some control over it.

A system may be (1) an *abstract* model; i.e. a mental construct or an attention frame (2) a *symbolic* model (verbal and/or mathematical) by which we record and communicate our abstract systems, or (3) a *physical* model which would be used as a «stand-in» for the segment of the real world which is of interest to us. (23 : 4-10)

In all above cases a system is a set of interrelated or interactive parts or elements which are bounded in time and space and are relatively isolated from the rest of the Universe or the environment. Relative isolation means that the system has a boundary and is linked to the rest of the Universe only by specified ways for the transfer of energy which are called inputs and outputs. As energy transfers, the inputs and outputs may be physical, infor rational or both. An input therefore is defined as *any* environmental influence on the system; and an output is *any* influence by the system on the environment.

Within a system, the components or elements interact in turn by the interchange of inputs and/or outputs of energy. Intra-system interactions occur in greater quantities and/or at higher rates than interactions with the environment. Interactions among the elements result in the elements assuming distinct states or magnitudes; hence elements may also be called variables. The interactions are usually patterned or organized by the existence of the system's boundary or some other constraint. The resulting pattern of interaction leads to a loss in the variety of the states of the system and may be visualized as the system's structure, or control for achieving some purpose. The effect of such interactions is that a system is always something *more than* and *different from* the sum of individual elements taken alone. (3 : 82-88)

More specifically we can say that each element or part in a system has a mode of action, or *transformation properties* of inputs into outputs. Transformation properties may be specified or defined in one of three ways :

(1) a set of *mathematical functions* or equations which are independent and consistent. Each equation depicts some input-output sequences as independent and dependent variables respectively.

(2) a logical operation indicating through a set of binary digits whether or not an output is possible given some inputs.

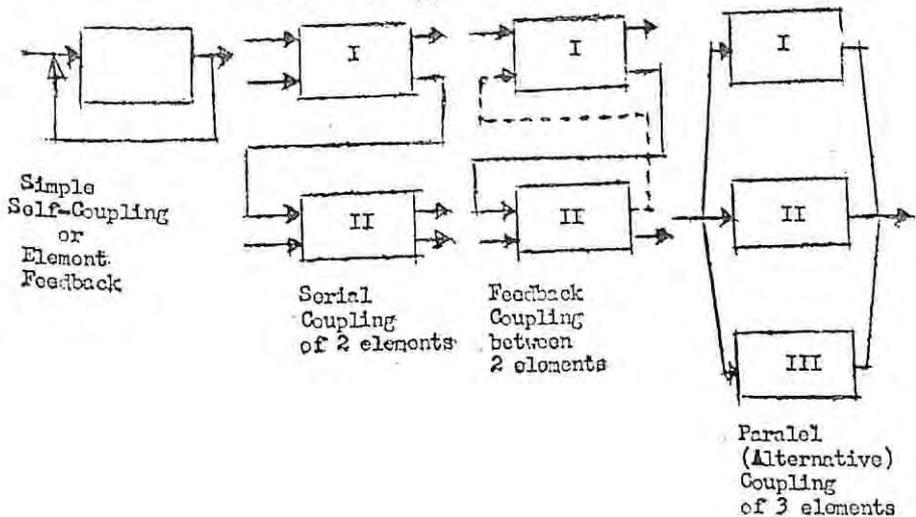
(3) a qualitative process showing which input attributes undergo some specified change during transformation into new outputs.

Definition or specification of the transformation properties by any of those three ways would give us the element's structure. If ramified input-output relationships exist in an element (or a whole system) then matrix representation and algebra become helpful. (12 : ch. 1)

Knowledge about the transformation properties of elements are not sufficient in themselves to yield the transformation properties of a system. What is equally needed beside the transformation properties of the elements is the manner in which the elements or subsystems of a system are coupled; i.e. interconnected. The same elements or subsystems coupled in different manners, would constitute completely different patterns of system transformation, and by extension different system structure. This is an important yet often overlooked point (15 : Chapter 6)

There are different ways in which elements or systems may be coupled as can be seen in the following illustration. For example, an element or a system may be self-coupled through a feedback. A feedback means that a part of the output, or information about it, is fed-back together with other inputs thereby making subsequent output related in some way to preceding output. Other examples of coupling may be that two or more elements (or systems) may be coupled in a serial, feedback parallel, or random manner (9 : Chapter 2)

Different Types of Coupling



The organization of elements in a system does *not* mean that all the elements in a system must necessarily be constrained i.e., rigidly linked or related together. It is sufficient for the emergence of organization or a system that only some elements operate under some constraints while other elements have some degrees of freedom in their interactions.

In an extreme situation of complete order (or maximal organization) of elements only one unique pattern of coupling of elements is permissible. All elements then operate under some constraints as in a rigidly fixed physical structure. Such an extreme situation is said to produce no variety; only one possible sequence of outcomes can be observed and which can be described and/or projected with great accuracy or certainty by means of deterministic models. By contrast, an extreme situation of complete disorder, «entropy», or maximal disorganization prevails if the interactions of elements in a system occur at random. No constraints then exist on the interaction of any variable and as a result the system's variety is great and all its outcomes are equally likely or uncertain.

Between these two extreme situations of complete order and complete disorder, lie relative states of organization which occur with some probabilities. These types of situations constitute risk for the analyst and may be approached by means of stochastic or probabilistic models. It may be assumed for example that random influences in a large number of trials would be normally distributed around an average. Given this assumption, we may either predict the probability of the occurrence of some value of a variable, estimate the value of a variable with pre-determined degrees of probability or confidence, and/or compute the expected value of a variable. Methodological problems arise however when the distribution of the values of outcomes is badly skewed or has a very large variance. It can be readily seen, incidentally, that the certainty of a deterministic system is a special case of a stochastic process in which all probabilities are either 1 or 0.

The analytical concept of a system in *static* equilibrium suggests some mutually consistent or harmonious structure and performance of some elements at a particular moment of time. A static equilibrium is said to be stable or unstable depending on whether a disturbance causes a temporary or permanent deviation from the steady state. A system in *stable* equilibrium will as a rule include at least one feedback coupling that is equilibrating in nature; i.e., acts as a self-regulator. If the system can assume any arbitrary state when disturbed its equilibrium would be called *neutral* and its feedback processes may be too weak or non-existent.

Such system is not goal - directed. A system which oscillates around some initial state would be in *quasi-stable* equilibrium and its feedback processes involve time-lags. There are types of feedbacks on the other hand that are *cumulative* or *disequilibrating* and which cause permanent deviation from the steady state; e.g. a growth or a decay in the unstable systems. We will discuss feedbacks in some detail in the following section.

Now we wish to point out that a system may be partitioned in number of subsystems: and systems may be combined in a super-system. Defining the boundaries of a system is therefore problematic. The elements in any situation and the possible combinations of relationships among elements may be too many to be manageable. For if n is the number of elements, the number of possible interactions can be as large as $n(n-1)$. Delineation of a system's boundary therefore is sometimes arbitrary and depends on the purpose, resources and measures at the disposal of the analyst. A system may often be redefined; either to include some elements that had been previously ignored or not identified; or to exclude some variables beyond the control or comprehension of the analyst (12 : Ch. 1)

Although all systems in real life are *open* systems in the sense that they interact to some extent with their environments, it is often convenient to cut off the influence of the environment by ensuring or assuming via the *ceteris paribus* procedure the existence of parameters, i. e., that the environment is temporarily constant. Such a *closed* system may be opened up, however, to trace the impact of some changes in the parameters. This procedure underlies so-called sensitivity analysis and contingency analysis. Sensitivity analysis tries to discern a dominant solution ; i.e. some state of the system which can be chosen as largely insensitive to reasonable variations in parameters. Contingency analysis on the other hand evaluates the performance of one system when it is confronted by radical changes in environmental parameters. (19 : 426)

Since most systems in reality seem to be semi-isolated and not closed, the use of the *ceteris paribus* method in scientific analysis is often slippery. It has been found that the *ceteris paribus* procedure leads to distorted conclusions if we seek information on the *absolute* levels and *rates of change* of variable within semi-isolated systems. No distortion results however, even in the long run, if our interest is in the *relative* values; i.e. ratios of variables within semi-isolated systems. (7 : 107-111).

From a policy-making or control point view in particular the system analyst may approach the system he wishes to control in a spirit of gaming in which he arrays his moves and the system's counter-moves in a pay-off matrix. The system analyst can in this way examine, select, and design a wide range of alternatives (32 : 420). To improve the effectiveness of control in any situation the controller may have to increase the number, quality, and speed of his moves and/or else reduce the variety in the (opponent) system, if possible, by adding constraints or by partitioning.

Since friction and co-operation are distinct types of interaction among systems, it is helpful sometimes to focus attention on such exchanges by means of inter-system models. These types of models, while recognizing the partial autonomy of each system, enquire whether and to what extent the connectives or couplings are harmonious or frictional; and what, if anything, need or can be done about them.

The Structure and Performance of a Cybernetic System

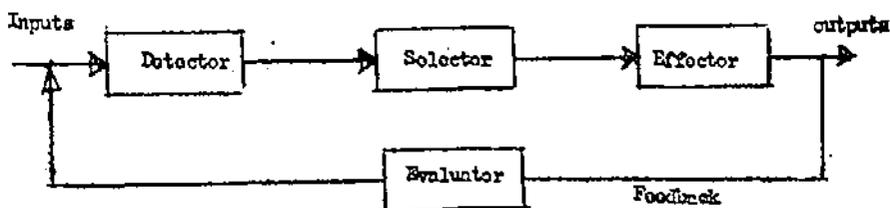
Cybernetics is the science which studies the common elements in communication and control processes in living organisms and machines, or more generally stated it is the science which studies the functioning of coupled parts (27 and 16 : 5). Norbert Wiener, the founder of modern cybernetics, has demonstrated how man, some types of machines, and combinations of men and machines are cybernetic systems because their performances can be found to rely on networks of information and energy flows by which they regulate a sequence of actions. Knowledge of cybernetics can help improve the effectiveness, accuracy, and reliability of systems. As Oscar Lange well observes :

«He who has learned to think in terms of cybernetics can — even without a detailed analysis — see the problem, see the essential links of the situation, the relations among elements and ways to the practical solutions which elude others» (Ibid : 174).

A simple cybernetic system consists in the following four functions which are analytically distinct but in reality are interactive and interdependent via information flows (1) A *detector* for defining actual reality, sizing up of existing situations and their trends, and possibly the search for other alternatives and opportunities. (2) A *selector* for indicating preferences, goals, priorities, and criteria of choice. (3) An *effector* endowed with the power to mobilize resources to implement the selected

course (s) of action, and (4) an *evaluator* for following-up the results of action and steering subsequent action via feedbacks. The existence of feedbacks makes the performance of a cybernetic system a closed loop or circular in a sense, as shown in the following illustration.

A Simple Cybernetic System



The inputs and outputs of a simple cybernetic system, indicated in the illustration, are energy flows in the form of information and/or physical resources which are being received from the environment, transformed within the system, and turned as outputs to the environment. This forward transformation path is accompanied by, and is partly guided by the backward (feedback) path.

To elaborate, the information inputs about *actual* reality, opportunities, and trends are either constantly or periodically compared with the conception of an *ideal* reality which is chosen by or laid down for the system. If an identity exists between the actual and ideal conceptions of reality at a given moment of time the system need do nothing (except perhaps self-congratulation, and/or long-term planning). Typically however a mismatch occurs because reality falls short than the ideal in some respects. The mismatch puts the system under a strain. To alleviate the strain the system mobilizes resources to produce some output (s) by which to change the system's environment. Or the system may change something in its structure, if possible, such as its aspiration level for instance so as to achieve better adaptation to the environment. Or the system and the environment may both undergo mutual adaptation.

A discussion of some types of feedbacks and their important roles in a system's performance is helpful here.

Equilibrating feedbacks have received widespread attention in the study of automatic controls systems under such names as *homeostasis* or *servomechanisms*. Such systems try to achieve some equilibrium vis-a-vis their environments. If the environment is ever changing however these

systems will be temporarily thrown off balance and may search for new and different states of equilibrium by re-structuring themselves (or be re-structured by their designer). This shift back and forth from equilibrium (order) to disequilibrium (change) is a necessity for adaptive systems. Their performance exhibits a counterpoint, so to speak, between order and change. Their adaptation, and re-structuring is the key to their survival or *ultra-stability*.

Disequilibrating or cumulative feedbacks on the other hand have been relatively neglected in the literature of systems analysis. Cumulative feedbacks occur in *unstable* systems which, when thrown out of equilibrium for some reason, find themselves in a growing contradiction due to the failure of the inputs and outputs of some elements to satisfy the inputs and outputs of the remaining elements. The resulting motion or development stands in contrast with the ability of the *stable* system to regain equilibrium through successive reduction of errors and contradiction (15).

It is useful at this point to distinguish between mechanistic feedback, such as that which occurs within some machines, and discretionary or selective feedbacks which are characteristic of purposeful systems. The existence of mechanistic feedbacks enable us to describe a system's trajectory or future state as function of initial conditions and fixed parameters. The existence of discretionary or selective feedbacks may open up a scope for revised rules of interactions over time. Systems which embody selective feedbacks cannot therefore be mechanically projected; their trajectories depend on the new information and meanings these systems receive and act upon along the way.

Through feedback processes some cybernetic systems therefore can learn. A learning process is said to occur if the same input (stimulus) results into a new and different output (behavior) (12 : Ch. 5). Feedback processes are essential for the learning processes since they act as self-modifying communication networks. The growth of scientific knowledge itself owes much to the existence of highly sensitive feedbacks in the form of experiments, testing of hypothesis, criticism, etc. all of which contribute to the successive reduction errors. Learning processes are important requisites for adaptation to the environment in open systems. Due to the possession of feedbacks the highly adaptive system sooner or later reacts selectively, not randomly, to environmental stimuli. This tendency of adaptive systems to change or elaborate their memories, and hence

structure and performance, stands in contrast with the typical tendency of closed (say mechanical) systems to lose organization and dissolve into their environments after intrusion of environmental effects (3 : 51).

Adaptive systems differ considerably in their learning capacities; i.e. storage, recall, and re-organization of information. Higher-order systems can in varying degrees manipulate abstract symbols, translate them from one format to another and recall them selectively; and can enlarge their knowledge by re-combining symbols in new forms and use stored information together with current inputs of information to make predictions; or «feedforwards». Adaptive systems also differ in their capacities with regard to the speed and variety of information which they can process. Last but not least, adaptive systems do vary in their abilities to change the ranking order of their preferences, goals, or values.

Adaptive systems may therefore be arranged in a hierarchy in terms of their types of feedbacks and the complexities of their respective memories (12 : 127-28) :

1. A first-order feedback system such as found in some simple machines which helps diminish action errors but does not change the operating networks of the system. Here self-control is possible but no selective memory exists.

2. A second-order feedback which corrects the system's errors by memory organization, self-consciousness and evaluation, scanning of internal elements and forecast of future needs. This may be called a «tactical» system.

3. A third-order feedback which includes the above and goes beyond in its ability to devise new plans, new operating rules, and longer forecasts. This may be called a «strategic» system.

4. A fourth-order feedback which can do the above plus revision of its learning methods so as to inspect reality more closely and/or modify preferences and goals. This may be called a «goal-changing» system.

According to Ross Ashby, a cybernetic system must possess a minimum of capabilities or so-called *requisite variety* if it is to control, or adapt to, its environment (1 : 206, 245 and 12 : Ch. 6). (1) The system must be able to respond selectively to the variety of states in its environment by exhibiting an equivalent or a larger number of distinct states. (2) Each of the system's distinct states must be qualitatively sufficient to

obtain a winning outcome. (3) The system's speed in processing information and applying the correct counter measures must be equal to or greater than that of the environment. If and when these three conditions are fulfilled together we can say that the requisite variety exist and that adaptation or control is a certainty.

The above suggests, among other things, that the ratio of «variety» (number of distinct states in an environment) to «requisite variety» (number of counter-measures available to the system) must be *less than one* in order for a system to achieve control. Thus if a certain degree of variety in an environment is given (i.e. the ratio's numerator is determined) then the *minimum* degree of requisite variety is easily obtained from the ratio. On the other hand, if the system's counter measures (alternatives open to the system) are given (i.e. the denominator is known) then the *maximum* variety that the system can handle can also be obtained from the ratio. To increase the effectiveness of control in a given situation the system may search for additional requisite variety, and/or else decrease the variety in the environment if possible by partitioning and other appropriate measures of simplification such as laying down some restrictions on the environment's freedom of action.

It is interesting to note how and why even a simple cybernetic system will often slip in its operations. Any one of the four analytical functions of cybernetic system as well as their links can easily go wrong and upset the whole system. Detection of realities and opportunities is never complete or precise. Preferences and goals are often vague, contradictory, or unrealistically high. Resources for implementation are always scarce relative to the demands upon them and their utilization is subject to random failures. Feedback evaluation often lacks clear criteria, and the evaluation itself may never be attempted regularly and honestly, and even if and when made, may be dismissed. In addition to all the above, the information flows back and forth among the elements may be delayed by time-lags. If the environmental changes are much faster than a system's corrective response the system's behavior follows a cyclical trajectory which may be regular, damped, or explosive.

Complex cybernetic systems which consist of several coupled systems will embody beside the just-mentioned sources of error additional difficulties on a magnified scale. For the multiplicity of systems may mean the need for reconciliation among several conceptions of actual reality, reconciliation among several conceptions of ideals and priorities,

as well as the delicate balancing of commands and incentives by which to mobilize resources for the implementation of decisions. Appropriate types of feedbacks may be lacking. Moreover the links of information among the subsystems will not only entail time-lags but will also contain the possibilities for informational filtering, distortion, and «noise» in the channels of communication. In addition the system's «memory»; i.e. its capacity for information storage and retrieval may be less than adequate.

An example of a fairly complex cybernetic system is a business corporation or a government department. Their organizational hierarchy may be visualized as a system of feedback-coupled elements. The high levels in the hierarchy have larger information but lesser energy than lower levels. The lower levels have greater energy but lesser information. Any level of authority perceives an environment which consists of feedback signals of lower levels and acts to change that environment by producing output signals which become the inputs or reference signals of the lower levels. The performance of the hierarchy thus depends on the timely ability of upper level loops to discern and correct the errors of lower loops.

By extension, one can get a feel of much more complex cybernetic system such as a whole society in which there are infinite number and types of hierarchical organizations and individuals coupled together in infinite number of ways.

System's Reliability

An interesting question in systems analysis and design is how to increase the reliability of probabilistic systems. Such systems may occasionally experience serious failures; e.g. by producing no output whatsoever inspite of the wide range of values of the input (s), or by resulting into output (s) which diverge from the expected tolerance margins. If an element in a system fails in its operation with a specified probability (q) within a specified period of operation, then the reliability of the element is $p = (1 - q)$. The reliability of the system is then a function of the reliability of its elements. (16 : 148-49)

Most production processes at the single plant level, market price mechanisms and adjustments, as well as hierarchical commands within organizations are examples of systems which are serially-coupled. A failure of one element in each case may cause a widespread disturbance

(Ibid : 156 ff). This is of great importance to theoreticians and practitioners in politics, economics, and administration who often face a long chain of interdependent elements.

In this very common case of serial coupling of elements the reliability of a system (P) is the product of the reliabilities of the component elements. If the reliabilities of the elements (p) are equal then $P=(p)^n$. The reliability of a system thus decreases in geometrical progression as the number of serially coupled elements increases. To illustrate this basic law, if the average reliability of elements in a system is assumed to be as high 0.99, then the reliability of the total system decreases rapidly from 0.9 to 0.4 to as little as 0.00004 when the number of elements is increased from 10 to 100 to 1000 respectively (Ibid : 150-15).

A sound design principle by which to increase a system's reliability in such cases without reducing the number of elements is to introduce a number of reserve elements, or reserve regulators, which are coupled *in parallel* and which can function in the case of a failure of the *serially*-coupled elements. For example, reserve elements might take the form of adequate stocks of raw materials and spare part, and reserve regulators might take the form of special incentive schemes either to enhance market forces or to activate bureaucratic performance.

In principle the reliability of a system can be brought as close to unity as desired (i.e. certainty) by increasing the number of its elements that are coupled *in parallel*. There must be a comparison however, and a balancing point, between the cost of acquiring and maintaining additional reserve elements and regulators and the benefit (decrease in expected loss) related to these additional elements. There is in principle therefore an optimal number of reserve elements and/or reserve regulators (Ibid : 154-167).

When available resources do not allow the use of the optimal amount of reserve elements and/or reserve regulators, the system's reliability can be increased to some extent by shortening the chains ; i.e. by reducing the number of elements coupled in series. Illustrations of these shortening of the chains are vertical integration among enterprises, more reliance on administrative means to expedite market mechanisms, and greater centralization of decisions.

Beyond a certain point however centralized decision - making may reduce rather than increase a system's reliability. For centralization

suffers from well known problems such as informational overloads and queuing; time-lags, filtering and distortion of messages; lack of initiative and low morale all of which may increase the spontaneity of the elements further away from the central planner's wish. (Ibid : 171-73).

Decentralization on the other hand, if carried too far, can dissipate information, increase the variety of states which the system can assume, and increase the uncertainties of planning.

Complex Systems

A system whose structure is inaccessible or too detailed and complex for modeling may be approached as a «black box». One can manipulate some of its inputs, observe and classify its outputs without being unduly concerned about the lack, or impossibility, of establishing conventional cause-effect relationships. As long as some pattern of input (s) — output (s) can be reliably discerned, the system may be coupled with other systems as if its structure were known. Care must be taken however since such a system may change its structure during «use» as, for example, when it is «forced to operate outside its previously tested range, or under a combination of inputs not previously considered, or when a series of inputs or the passage of time alters its memory content ...» (12 : 32 and 1 Ch. 6).

Insofar as very large and imperfectly known systems are concerned, there will always be of course various and only partial conceptions of their behavior. For as Ashby suggests, «there can be no such thing as *the* (unique) behavior of a very large system, apart from a given observer» (1 : 106). It is necessary then to specify the observer of the system with the observation, and if possible, to synthesize the observations.

Complex systems may also be sometimes conveniently defined by *direct* methods of simplification such as for example elimination and grouping. Or they may be defined indirectly by focusing on and specifying their «controlling structures»; i.e. values and norms which guide and integrate these systems (12 : Ch. and 8).

An example of a complex and imperfectly-known system is a social system based on a division of labor. The elements of a social system may be said to be individuals and/or groups *interacting in roles*,

A role can be visualized as a transformer of rights (inputs) into obligations (outputs). Roles typically contain a range of freedom and are subject to random variables. The existence of roles however contributes to fairly stabilized interactions among the role occupants as to what to do, how, when, with whom, for what purpose, and with what reciprocity. It is possible to aggregate similar roles together into a number of social structures, or sub-systems of the social system and to gain thereby some further insights by using additional categories of systems analysis (10 and 11).

The social system however seems to be an unsystematic system, knowable, predictable, and controllable *only in part*. From which it follows that trust in the possibilities and results of comprehensive, centralized, explicit, and precise planning of social systems can be easily overdone. What is required in social systems is a balance between order and freedom; harmony and conflict; control and constructive deviance. Still the application of systems analysis to social systems may be useful in the modest but no mean achievement of enhancing the planners' capacity to (1) *scan* the structure and performance of social systems and (2) *focus* on the sub-systems or elements whose problems are more urgent and whose solutions could be found (10).

General Systems Theory

Refinements, cross-fertilization, and development of concepts of systems have grown in recent years under the relatively new philosophy of science called General Systems Theory (20).

General Systems Theory embody two approaches which are complementary and useful in establishing some «discipline» in inter-disciplinary and cross-disciplinary studies. These two approaches have been well stated by Kenneth E. Boulding (2).

The first approach of General Systems Theory is to develop abstract concepts of organization *per se* regardless of that which is being organized. Towards that end the endeavour is to develop generic concepts and models which are common to several disciplines such as, for instance, equilibrium, growth, decay, adaptation, conflict, etc. In their levels of abstraction such concepts and models lie somewhere between the highly generalized and in a special sense empty concepts of mathematics on the one hand,

and on the other hand the highly specialized categories of various academic disciplines (Ibid : 197 ff).

The second approach of General Systems Theory is both more ambitious and systematic. Its aim is to arrange theoretical systems in a hierarchy of increasing complexity which corresponds to the increasing complexity of the empirical Universe. The value of such an arrangement is to know when studying a particular level of the empirical world, whether or not the appropriate type of theoretical system is being employed. (Ibid),

A familiarity with Boulding's hierarchy of systems can therefore be very useful. Boulding identifies nine types or levels of theoretical systems of increasing complexity as we move from «lower» to «higher» types. The lowest and simplest type of theoretical system is the «static framework» (appropriate for the geography and anatomy of the Universe). Second up is the «clockwork» type of system with pre-determined necessary motions (appropriate for the solar system and some simple machines). The third, is the «thermostat» system (appropriate for automatic-control machines). The fourth is the «open» type system capable of self-maintenance and self-reproduction (appropriate for single cells or simple organisms). The fifth is the «cell society» which is capable of some division of labor but contains no developed information system (appropriate for plants). The sixth is the «animal level» of system which in addition to all the above capabilities has mobility, teleological behavior and some self-awareness (appropriate for the animal kingdom). The seventh is the «human» level of system (appropriate for the individual human being), where self-awareness, memory, learning, and larger freedom in the choice of ends and means are some of its main features. Eighth is the more complex «social organization» level of system (appropriate for human society consisting of individuals interacting in roles and using symbolic language and information flows). Last is a «transcendental» level (appropriate for any ultimates, absolutes, and unknowables which may exhibit systematic structures) (Ibid).

As Boulding noted, «Because, in a sense each level of theoretical system incorporates all those below it, much valuable information and insights can be obtained by applying low-level systems to high-level subject matter. Thus most of the theoretical schemes of the social sciences are still at level two, just rising now to three, although the subject matter clearly involves level eight. Economics, for instance, is still largely a «mechanics of utility and self-interest» in Stanley Jevons masterly phrase».

The insight that follows from this hierarchy «prevents us from accepting as final a level of theoretical analysis which is below the level of the empirical world we are investigating» (Ibid : 9).

Types of Systems Analysis

Sometimes the term systems analysis comes to acquire some specific or narrow meanings in some quarters. To some, systems analysis is nothing but the scientific method with a quantitative orientation and/or a wholistic approach to the study of phenomena and problems. To others, systems analysis is a close kin to Operations Research and Management Science, and as such is essentially a problem-solving technique. To others, systems analysis refers to the information-processing procedures conducive to better communication within organization and/or with their respective environments.

It is possible in the light of our exposition so far to point out how that each of the three above concepts of systems analysis, though correct, is incomplete and therefore mistakes a part of the endeavour for the whole.

First, while systems analysis is a scientific method of investigation it is also in a sense a body of knowledge in its own right and often with its own broad insights and conclusions; such as e.g. Ashby's Law of Requisite Variety, and Lange's Design Principle mentioned earlier.

Second, while some system analysts focus attention on information processing procedures within systems, the system analyst in the broad sense of the term may go beyond that aspect of interaction among elements to investigate also aspects of system structure, goals, and performance which are much broader than data-processing.

Third, while Operations Researchers and Management Scientists employ system categories and analysis in problem-solving, it is possible to state an inverse relationship in which Operations Research and Management Science techniques appear as special types of systems or models which, in spite of their diversity, do not exhaust the whole range of systems or approaches to problems-solving. This point calls for some elaboration.

The systems used in Operations Research and in Management Science are generally mathematical, statistical and economic models of

decision and control which have proved themselves useful in certain situations of complexity and uncertainty. These models enable us to determine the probable action-outcome relationships, devise appropriate measures of effectiveness of various alternatives, and thereby help us choose the «best» possible alternative course of action (13 and 26). Broadly speaking, the problems which are handled by Operations Research and Management science are *in essence* those of optimization. As is known, optimization problems must be cast in an ends - means schema in which the ends or goals are clear and given and the means are unknown. As Operations Researchers and Management Scientists know, the goals are often vague and/or in conflict. Moreover, ends and means are often interactive and simultaneously determined. Thus it is possible to optimize for a wrong goal and/or for a sub-goal. Often it is necessary to clarify, reconcile, and/or re-define goals and policy problems before they can ever be optimized. To do so clearly requires a repertoire of skills or models of analysis and control other than optimization.

To suggest that the formulation of policy problems may at a certain stage become a part of the task of the system analyst does not mean that the latter can or should reject the sponsor's conception of the problem. Rather the approach of the system analyst should be that of a physician who neither dismisses the patients' own formulation of their problems nor accepts it unquestioningly (18 : 409).

It may be useful in concluding this study to indicate some broad types of systems analysis and illustrate its diversity.

Provided that the structure of a system can be specified and/or the degree of reliability in its performance can be established, the information can be put to one or more of the following purposes :

- 1.—*explain* the cause - effect relationships among elements or variables.
- 2.—evaluate to what extent the system's structure and performance are *adapted* to the environment and/or effective in *adapting* the environment.
- 3.—observe the critical limits between which the system is *insensitive* to variations in environmental parameters.
- 4.—estimate the system's performance in the face of an unforeseen *contingency*.
- 5.—analyse the system's *informational needs, flows, and facilities* and suggest improvements if need be.

6.—*predict* the system's outputs from given inputs so as to stimulate its future behavior and/or enquire into means for increasing its reliability.

7.—*compute* which system's inputs are required to obtain a given level and/or composition of output.

8.—*optimize* the system's performance by maximizing its goal-achievement subject to some input constraints; or else minimize the use of inputs subject to some goal constraints.

9.—*integrate* a system by resolving some of its strains or conflicts which may be detrimental to its performance and help thereby mobilize more energy in the system or prevent its disintegration.

10.—analyse how a system *grows* or *decays* quantitatively and/or qualitatively due to its intakes of physical and/or informational inputs

11.—*re-design* a system's structure in order to meet some given output specifications either by incorporating new elements or inputs and/or coupling existing elements in new ways.

12.—*control* a system by manipulating a set of measures or inputs by which to counter the variety in the (opponent) system and ensure a winning payoff.

Needless to say some of the above types of systems may require mathematical and statistical tools; others may require historical, sociological and other knowledge; while others still require elements of judgement and intuition.

The above types, though extensive, are not meant to be exhaustive of the types of systems analysis that are possible. The list is merely suggestive and helps us avoid mistaking one type of systems analysis for the whole genere or applying one or few of them invariably regardless of the problem at hand. The list also suggests how systems analysis ideally should be carried out by a person with a diversified expertise, or by a group of persons with diverse backgrounds and able to communicate with each other.

The whole orientation of systems analysis is one of relating parts to wholes in *analysis*, and *practice*, and in devising measures that can «cope (not overcope or undercope) with the chosen level of complexity» (12 ; Editor's Forward p. VIII).

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SOME THOUGHTS ON INFLATIONARY MECHANISM

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Rising prices are not necessarily an unhealthy phenomenon against which the economy should always react. Actually, economic prosperity and expansion are usually associated with appreciable increases in prices and wages. But the difference between a desired situation, like prosperity, and an undesired one, such as inflation, lies mainly in the «degree» and the «speed» of increase in the prices of products and factors of production. It is from obliterating such difference that confusion might arise concerning the real dangers of inflationary possibilities inherent in price increases. Accordingly, the crux of the problem lies in our ability to determine the limits between the warranted range of prosperous price increases and the unwarranted range infested with the dangers of inflationary spirals.

It is true that moderate, gradual, and justifiable price increases cannot always be assuredly contained within safe limits; they may accelerate to the extent that «flight-from-money» may become an observed phenomenon. If this ever happens, the question arises whether things will necessarily get out of hand, leading to the catastrophic collapse of the monetary system.

When people become accustomed to steady price increases, they might speed up their defensive reaction against expected higher prices. The adjustments in expenditure, on the one hand, and in prices at which sellers are willing to offer their products and services, on the other hand, may well tend to be made faster, as people realize that failing to make these adjustments will always mean greater loss to them than otherwise. The speed of inflation is even more accelerated when people — as they defend themselves against the last rise — make allowance for further price increases.

Since expecting inflation to continue directly concerns people's wealth, they may tend to hold it in real forms. This tendency may come to its extreme when prices are increasing so fast that people do not hold but the barest minimum of money needed for necessary transactions,

because it is losing its value at a very rapid rate. In other words, people's elasticity of demand for real cash balances, with respect to the expected rate of price change, would increase in absolute value as this expected rate goes up⁽¹⁾. Under these circumstances, which indicate hyperinflation, the monetary system would be bound for a complete collapse.

It is true that inflationary pressures must precede flight - from -money, which, in turn, is a necessary condition for an explosive outcome. It is also true that such a sequence of events had taken place in actuality : Empirical evidence shows typical cases experienced in Germany after the First World War and in Hungary and Greece after the Second World War⁽²⁾. But to benefit from past experience is something, and to be under the psychological strain of being threatened by runaway inflation is another thing. The proper evaluation and judgement in this respect requires comprehension of both necessary and sufficient conditions for persistent price increases to have explosive inflationary outcomes.

Thus the question we should investigate is : If rising prices lead to the expectation of further price increases and, thus, to flight-from-money, does it necessarily follow that inflations are inherently explosive ? To answer this question we shall examine four propositions which are seemingly involved :

- 1.—That rising prices lead to the expectation of further price increases.
- 2.—That this expectation leads ultimately to "flight-from-money".
- 3.—That flight-from-money is a sufficient condition for an explosion.
- 4.—That inflations are, therefore, inherently explosive.

In what follows we shall discuss the first three propositions, respectively, and our final conclusions will determine to what extent the fourth proposition is true :

First we discuss whether rising prices lead to the expectation of further price increases. Let us start with the assumption that gross national

(1) See : Philip Cagan, "The Monetary Dynamics of Hyper-Inflation," in : M, Friedman (ed.), *Studies in the Quantity Theory of Money*, The University of Chicago Press, Chicago, 1956, pp. 29-117.

(2) See : A.J. Brown, *The Great Inflation, 1939-1951*, London : Oxford University Press, 1955; R.G. Lipsey «Does Money Always Depreciate?» *Lloyd's Bank Review* Oct. 1960, pp. 1-13; E.M. Lerner, «Inflation in the Confederacy,» in Milton Friedman, ed., *Studies in the Quantity Theory of Money*, The University of Chicago Press, Chicago 1956.

product is a fixed amount, and that we already have a trend of rising prices(1). The question which concerns us is whether people would expect the same trend to continue in the future(2).

At the very beginning of price increases, and especially if people had been accustomed to a constant value of money, one would not expect them to be aware of the drop in their purchasing power. Using an economic jargon, they would be under "money illusion". In addition, there will be a time lag between the actual rise in prices, and people's expectations of further ones, before they become aware that it would be worthwhile to reduce their cash balances in the face of rising prices. The situation will thus be characterized by two phenomenon : First, money-illusion, whose source is presumably an ignorance of the effects of rising prices on «real values» of money incomes and assets. Second, uncertainty about future prices, translated in terms of a «time lag» between expected and actual price rise. The more recent is the inflationary pressure, the longer will be such a time lag.

Thus, rising prices may not at all lead to expectations of further increases, and the whole situation may turn out to be just a relatively short duration of mild inflation. The expectation lag(3) may be «long enough» to allow for a price boom to take place and end up with no serious repercussions at all. In this case people's attitude towards the higher price level would be a passive reaction; their real expenditure will be either curtailed, or maintained by increasing money demand through borrowing or reduced savings.

But the term «long enough» is used here in a relative sense. In a case of a short run price changes (increase), a «certain length» of an expectation period may be long enough not to lead to further price increase. Whereas that same «certain» length may fall within an extended duration of a persistent price increase, thus accentuating its trend.

In other words, people's defensive reaction would only take place with a persistent price rise, of a duration sufficient to put an end to money illusion. If this condition is met, people would expect further rise in prices, and their expectation becomes a function of present price change (p).

(1) Whatever the initial cause of this trend may be.

(2) See : R.A. Kessel, and A.A. Alchian, "Effects of Inflation," *Journal of Political Economy*, December 1962, pp. 521-537.

(3) Especially when rising prices are relatively recent and after being accustomed to a constant value of money.

Here we get directly into the discussion of the second proposition: i.e., that expectation of further price increases will lead ultimately to «flight-from-money». This requires an investigation of the self-generating mechanism of inflation, by referring to two types of forces which result in speeding up its internal momentum; namely, (a) wage-price spiral, and (b) velocity mechanism.

- (a) Wage-price spiral : This process proceeds by way of mutual reinforcement of wages and prices, and can be ignited in a number of ways : Labor organizations may set them off by negotiating wage rates which raise wage costs to a point where profits are reduced below the «normal» level, as considered by entrepreneurs. The spiral can also be induced by an excess demand in a number of markets, or by a rise in import prices, which result in the reduction of real wages ... etc.⁽¹⁾ Whatever may be the initiator, our concern is to find out if this spiral could ultimately lead to flight-from-money and have an infinite duration.

The wage-price spiral represents — as known — a struggle between business and labor for inconsistent shares of national income. This does not necessarily mean that the process will continue forever⁽²⁾.

In the first place, both groups may succeed in getting what they want by extracting it from pensioners and rentiers who have no bargaining power. The money income (or expenditure) of the latter remains constant during the inflationary process so that their real expenditure is sufficiently reduced to make room for bigger shares for the other two groups⁽³⁾. This is usually one of the main reasons for an inflation to come to an end of its own accord.

In the second place, not all of the labor force and the firms have enough monopoly power to acquire always what they want. The bargaining power of organized workers is usually more or less limited by what employers are able and willing to grant. The more the employers are unable to pass wage increases on to the consumers in the form of higher

(1) See : R. A. Kessel and A.A. Alchian, «The Inflation - Induced Lag of Wages», *American Economic Review*, March 1960, pp. 43 - 66; L.G. Reynolds, «Wage Push and All That», *AER, Proceedings*, May 1960, pp. 195-204.

(2) W.G. Bowen, *Wage Behavior in the Postwar Period*. Princeton, N.J.; Princeton University Press 1960.

(3) E.C. Budd and David F. Seiders, «The Impact of Inflation on the Distribution of Income and Wealth», *American Economic Review*, May 1971.

price, the more strongly they will resist wage increases. The opposite holds, the more the employers have control over prices. That is to say any significant increase in monopoly power, either in the labor or the product market, obviously increases the dangers inherent in the wage-price inflationary mechanism.

A third factor to be considered is the fact that unemployment would be the price paid by the workers for continued higher wages. And it is by no means clear that labor unions are willing or able to make this sacrifice for long⁽¹⁾. Moreover, public opinion is likely to add more pressure to dampen additional wage increases.

Fourth, the wage-price spiral has a built-in mechanism to set for itself a limit. For its continuation, the supply of credit must have enough elasticity to allow the economy to finance the higher levels of money income. Otherwise, speculative and idle balances will have to be drawn into transaction purposes. This will lead to a rise in interest rates which, if continued, will ultimately discourage investment activities. Income distribution may well shift in favor of workers and against profit receivers, particularly if wage costs are rising faster than prices. Emphasizing this shift will be the differential effects of the income tax: Profit receivers, who are typically in higher income brackets, will be subject to higher marginal rates of taxation than will wage earners⁽²⁾. The discouragement of investment may be sufficient to moderate the demands of workers and employers, and to bring a halt to the increase in wages and prices.

It thus follows that the continuation of the wage-price spiral is conditional to the expansion of the stock of money at a rate which is sufficient to allow prices to rise in proportion to the increase in wage costs⁽³⁾.

(1) If unions are ready to accept the sacrifice, the inflation can continue, though at a somewhat reduced pace; the unemployed workers will compete with employed workers in the noneorganized industries. This tends to depress wages in these activities. See: A. W. Phillips, «The Relation Between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom, 1862-1957, *Economica*, November 1958, pp. 283-299» R. Lipsey, «The Relation Between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom, 1862-1957; A Further Analysis», *Economica*, Feb. 1960, pp. 1-31; G. Perry «Unemployment, Money Wage Rates and Inflation» Cambridge, Mass; MIT Press, 1966.

(2) B.P. Pesek, «Distribution Effects of Inflation and Taxation», *American Economic Review*, March 1960, 147-153.

(3) A. Smithies, 'The Control of Inflation', *Review of Economics and Statistics*, August 1957, pp. 227-283.

(b) Velocity mechanism : A general rise in prices, regardless of the initial cause, reduces the purchasing power of money. If the increase in prices continues long enough⁽¹⁾, people will tend to exchange their monetary assets for goods and stocks. This gives an additional boost to the price level, and bond prices will fall⁽²⁾. Recalling our second assumption that «expectation of higher prices is a function of price change», we would expect the further rise in prices to lead to the conviction that an even higher price level in the future will prevail. This will force people to exchange a greater proportion of their cash assets for goods. If this happens, it indicates the beginning of a flight-from-money attitude. If we now add a third assumption, namely that the demand for money is a simple transactions demand (LPX) *minus* a flight term, we can write the equation :

$$M_d = LPX - \alpha \dot{p} \quad (1)$$

Here we come to discuss our third proposition, i.e., whether flight-from-money is a sufficient condition for an explosion :

Our concern here is whether flight - from - money would lead to an endless self-generating process of further rise in velocity, prices, ... and so on. At this stage of our analysis we add two more assumptions :

1.—That all surplus money ($M_o - M_d$) is spent in the commodity market.

2.—That price change (\dot{P}) is a linear function of excess demand, i.e. :

$$\begin{aligned} \dot{P} &= \beta (M_o - M_d) \\ \therefore M_d &= LPX - \alpha \beta (M_o - M_d) \end{aligned} \quad (2)$$

Working this out we find that stability (i.e., nonexplosive path for P) depends on the numerical values of α and β . From equations (1) and (2) we get :

$$\dot{P} = \beta [M_o - LPX + \alpha \dot{P}]$$

Putting $M_o = L \bar{P} X$ for equilibrium general price level (\bar{P}) :

(1) See : S. A. Morely, *The Economics of Inflation*, The Dryden Press Inc., 1971, pp. 65-199.

(2) Since Price rise will be associated with general expansion in economic activity, this, with constant supply of money, will lead to higher interest rates, i.e., a general fall in bonds' prices.

$$\dot{P} = \beta [L \bar{P} X - L P_t X] + [\alpha \beta \bar{P}] \quad (1)$$

$$\therefore P_t = \bar{P} + \dot{P} \left[\frac{1 - \alpha \beta}{-\beta LX} \right]$$

Solving this differential equation we obtain :

$$P_t = P + A e^{-\frac{\beta LX_t}{1 - \alpha \beta}}$$

The solution indicates that the path⁽²⁾ of P_t depends on the behavior of the second term of the equation. This, in turn, depends on the value of $(\alpha \beta)$:

If $\alpha \beta = 1$, the second term will be zero and P_t will thus follow an equilibrium path, i.e., sticking to \bar{P} . If $\alpha \beta < 1$, the exponent of the second term will be negative, leading to an ever decreasing rise in \bar{P} , such that P_t follows a convergent path. This means that inspite of the expectations of further price increases, and flight-from-money attitude, the inflationary pressure is not explosive. Finally, if $\alpha \beta > 1$, the exponent of the second term will be positive, leading to an ever increasing rise in \bar{P} , such that P_t follows an explosive path.

These results give the answer to our inquiry into the forth, and final, proposition. Inflation is, indeed, *not* inherently explosive :

As we have seen from the mathematical analysis, inflationary explosion depends on two numerical values :

1. The coefficient of expectation (α) ; the larger it becomes the larger is the flight-from-money term $(\alpha \dot{P})$.

2. The coefficient of price change (β) .

$$(1) \dot{P} - \alpha \beta P = \beta [L \bar{P} X - L P_t X]$$

$$\therefore \dot{P} (1 - \alpha \beta) = [L \bar{P} X - L P_t X]$$

$$\dot{P} (1 - \alpha \beta) = -\beta LX [P_t - \bar{P}]$$

$$\therefore \dot{P} = \frac{-\beta LX}{(1 - \alpha \beta)} (P_t - \bar{P})$$

$$P_t e^{\left[\frac{-\beta LX}{1 - \alpha \beta} \right]} = \dot{P} + \bar{P} \left[\frac{-\beta LX}{1 - \alpha \beta} \right]$$

(2) Whether stable (i.e., with dampened or on oscillations) or explosive

We have also found that $\alpha \beta$ can assume any one of three possible values (≤ 1). Which value of these should be expected to occur is not an easy question to answer. However, we can at least think of some factors which would have the effect of ever suppressing the values of α and β ; thus preventing the inflationary process from persisting forever :

1.—A built-in limit may again present itself in the form of rising interest rates. The spiral of rising prices (represented by the value of \dot{P}) and thus the magnitude of \dot{P} can accelerate only if the supply of money (M_0) is expanding at a rate which allows the interest rate to be kept relatively low. Such acceleration would increase as part of the new money supply is poured in the transactions sphere (instead of being held in idle balances) thus increasing the excess demand for goods and stocks. This gives new boost to rise in price (\dot{P}) and may ultimately raise the value of the coefficient (α) itself. On the other hand, the opposite will happen if M_0 is fixed. If it is reasonable to expect the monetary authorities to follow a policy of containing inflation within safe limits, we would expect them not to be enthusiastic for increasing the supply of money.

2.—Moreover, the «supply of money - price - spiral» mechanism may well prove not to be an important explanation of the inflationary process. To assume that rising prices will lead to a general reduction in cash holdings may not be completely justified. Though this assumption may be true for some people, others may be led to believe that prices will stop rising, or even fall. We will not have a consensus of opinion on that matter, and therefore it is hard to tell what the net effect will be on the size of flight term ($\alpha \dot{P}$), and consequently on the demand for money assets. However, taking into consideration the most rational⁽¹⁾ policy of the monetary authorities in containing inflation, one would expect this effect to be small.

3.—Of course, if prices were on the rise, a general belief in the continuation of inflation might result. But an inflation may have to go a long way before such point is reached⁽²⁾. In addition, there is the possibility that certain holders of cash assets, such as insurance companies,

(1) Actually it is also the most probable.

(2) In a study by P. Cagan for seven cases of hyper inflation he found that very intensive price movements failed to provoke anticipatory cash flights and velocity movements. He attributes this to people's «confidence in the future value of money.» See : P. Cagan, op. cit.

may not be concerned with the depreciation effects of inflation⁽¹⁾. These factors tend to suppress the value of β .

Again, all these attenuating factors can be summarized in terms of money - illusion and uncertainty. Even after fairly long periods of inflation, there is no way for the public to know whether future prices will be higher or not⁽²⁾. Long-run price trends are found to be interrupted by short-run fluctuations, which are associated with many kinds of «random shocks». These short run variations are large and frequent enough to make expectations of price changes over a short period uncertain. The shorter the period over which price level variation is being considered, the more hazardous the expectation will be⁽³⁾.

4.—Whatever uncertainty, money-illusion, both, or any other reason may be, studies on the subject indicate that there is little chance for an independent velocity mechanism to develop in a period of rising prices. Once the initial cause of inflation is removed, price increases will begin to taper off, and velocity will begin to return to its normal value⁽⁴⁾. Price increases in seven extreme hyper-inflations were found to be not self-generating; they were proved to be a direct result of increasing the quantity of money. Another important phenomenon was that issuing money on a large scale did not lead immediately to extreme flight from cash. This behavior is interpreted not in terms of an inelastic demand for money, but as a result of individuals' confidence in its future value, which maintains the lag in expectations of future price increases. This means a small value for α and accordingly for β . However, in later months of an inflation the lag tends to shorten in response to the continuous trend of rising prices.

(1) The liquidity preference of those institutions which have liabilities in money terms will not necessarily be reduced when prices rise.

(2) In a study by B. Siegel for twenty-nine countries' experiences in the post-war period, he found that it is not possible to predict velocity movements on the basis of price movements at all. See : B. Siegel : «Hyper-Inflation-The Velocity Mechanism,» Proceedings of the Thirty-Third Conference of the Western Economic Association, 1958, pp. 17 -21.

(3) It was found that «a fifty-year period gives some margin in favor of inflation, a ten-year period gives little, and a one-year period gives almost none». See : R. Lipsey : «Does Money Always Depreciate ?» Lloyds Bank Review, October 1960, pp. 1 -13.

(4) Cagan, op. cit.

To sum up, velocity can — indeed it often does — rise and stimulate the inflationary process. Nevertheless, price increases could be checked by several factors which suppress the effects of the coefficients of price expectation and price change (i.e., giving small numerical values for α and β).

Conclusions :

The price-wage spiral is always limited by the development of unemployment and high interest rates. Otherwise, the mechanism will be most potent in an environment of monopoly and easy credit. Moreover, the workability of the velocity mechanism requires an absence of money-illusion and a general conviction that the trend of rising prices will continue. An elastic supply of money is also of vital importance to the continuation of this mechanism.

There are enough evidences that a runaway inflation, based upon a cash-flight mechanism, is difficult to provoke unless the monetary authorities turn to an excessive issue of money. Unless this last condition is met, the value of the coefficient α will be too small to give a significant value for the flight term ($\alpha \dot{P}$). This will eventually lead to an ever decreasing rise in prices (i.e., \dot{P} will be decreasing).⁽¹⁾ Although something like a wage-price spiral has probably been operating in the post-war period, it has not yet proved that it had been strong. Moreover, even with the assumption of flight from money, this is not in itself a sufficient condition for an explosive trend of P_t .

Inflation could possibly be kept in the creeping stage, thus sparing the economy the risk of getting into an explosive inflationary path. It is not so legitimate to argue that present days' commitments of governments to full employment policies would allow significant pressures to develop in the future. This is because such commitments are at the same time commitments to a favorable environment for investment activity. In fact the inflation-generating aspects of a full-employment policy can be counter-balanced by sustained increases in production capacity. Although the latter probably will not prevent a rise in the price level, it is nevertheless potentially significant in taking a considerable edge off the inflationary forces.

(1) See equations (1) and (2).

All these factors will tend to suppress the values of α and β , thus pushing P_t more towards its equilibrium level \bar{P} . If we agree that a single counter-example refutes an assertion of «general necessity» we can legitimately argue that the single possibility that the value of α β may be less than unity, strongly supports the conclusion that flight from money is not a sufficient condition for an explosion.

CIVILIAN RIGHTS UNDER BELLIGERENT OCCUPATION

**With special study of Israeli violations of Human
Rights in occupied Arab territories**

Dr. Mohie El-Din Ali Ashmawi

INTRODUCTORY SECTION

Evolution of War Theory

In this introductory section, we presented the development evolution of war theory from its legality, from the point of view of the traditional international law to its illegality according to the contemporary international law. This is presented in the following :

CHAPTER 1

War as a legal act from the point of view of the traditional international law.

In the past war was a lawful act «jus ad bellum» for all nations using it when and how they wished. No restrictions were imposed upon this right or the country's freedom to resort to war in realizing its national interest or any other goals.

War as a Legal Act :

War has been defined as a social phenomenon in which all the human societies took part since the dawn of history. War has existed since prehistoric times up to our own era. It still exists despite the development of civilization and the growth of the human mind which distinguishes between good and evil. War is still a means to which countries resort in our civilized world to realize their diverse goals just in the same way as it was in the past before the reorganizations of the international society and issuing the laws which govern international relations.

The definition of war

According to the traditional international law the word war may be defined as « A state of belligerence arising between two states or more and ending a state of peace between them and in which the armed forces are used in full armed conflict. Each contending party tries to win victory upon its enemies ad hoc, imposing its will upon them and dictating its own terms of peace.»

During the Greek and Roman times up to the beginning of the Medieval ages war was considered an absolute right to all countries. But in the various works of ancient Greek scholars we can find certain texts which made distinction between the just war and the unjust war.

Revealed religions took different attitudes towards war from the point of view of its legality or illegality. Whilst Judaism legalized war, even glorified it and never imposed any bounds on waging it, we find that Christianity only legalized just war «which was waged to free peoples from oppression.»

Islam has prohibited aggression and illegalized fighting except in cases of repelling aggression. It has also set certain human principles by which the fighting parties should be abided and never deviate from them; such principles may be summed up in the following.

- 1.—Protecting civilians and refraining from fighting them.
- 2.—Respecting the principles of humanity even in time of war.
- 3.—Prohibiting the murder of monks, aged women, and children.
- 4.—Prohibiting sabotage and demolishing the enemy's properties.
- 5.—Prohibiting the murder of prisoners of war and treating them within human principles.
- 6.—Respecting treaties and charters contracted with the enemies during war time.
- 7.—Prohibiting pillage and the looting of the enemy's properties.

Prophet Mohammad (Peace be upon him) ordered the Moslem armies to respect the aforesaid principles during warfare. He also urged Moslems to adopt the policy of coalition and compromise among the people wherever possible so as to evade the horrors of war. The Caliphs and Moslem leaders adopted such principles after the end of the Prophet's era.

Up to the beginning of the 19th century war continued as a lawful means to which countries resorted voluntarily to realize their ends. It was prevalently held that war was an aspect of sovereignty and an indispensable necessity and also an absolute legal act. This was taken for granted as a formula that was deeply settled in the jurisprudence of the traditional international law and its customary rules.

CHAPTER 2

Illegality of war in Contemporary International Law.

In the beginning of the 19th century an urgent call was raised to forsake war in international relations. The jurisprudence of the international law, together with the treaties among the powers, up to the beginning of the present century have contributed to the efforts exerted with the intention of forsaking War. Such efforts have been effective in different ways in realizing their goals. This can be illustrated in the following :

1.—International responsibility should be forwarded to individuals accused of waging war.

2.—Imposing restrictions on the rights of the country in waging war.

3.—Responsibility should be forwarded to the acts of countries as result of which war may break out.

After the end of the World War I, the call for prohibiting war continued passing through various stages :

First Stage : Setting restrictions on the right of waging war according to charter of the League of Nations.

Second Stage : Prohibiting the aggression war in the different international treaties such as the Charter of Bryan - Kellog in 1928 which prohibited war.

Third Stage : Prohibiting war according to the United Nations Charter 1945 whose various articles stated the banning of using force or the menace to use it.

Also it committed all the member states of the Organization to settle international disputes peacefully. As an exception, force may be resorted to in case of self defence whether individually or collectively. Also force may be resorted to in case of collective security measures with assignment from the Security council or the General Assembly.

Despite the fact that war and the use of force or the menace of its use has become an unlawful act within the principles of the contemporary international law, we find that the phenomenon of aggression is still going on under the nose of the international law. A conspicuous example is what Israel has done by waging a war on three Arab states (Egypt, Syria and Jordan) on June 5th 1967 and its unlawful occupation of territories belonging to these states, still its continuation of such aggression up to now.

SECTION ONE

The Law Theory of Belligerent Occupation

CHAPTER 1

The Definition of Belligerent Occupation and Expounding the range of its Legality within the principles of Contemporary International Law.

The First Quest

The Definition of Belligerent Occupation

Belligerent Occupation may be defined as «A stage of war directly succeeding the stage of invasion in which the forces of the fighting country penetrate the hostile area or the enemy's territories and subjugating these territories under its sovereignty after gaining the balance of power on its side in an unquestionable manner and in which all the armed strife come to a standstill and in which quietude completely prevails on the battle fields»

The Second Quest

The Illegality of Belligerent Occupation within the Principle of Contemporary International Law.

War or the use of force and invading other country's territories has become a crime prohibited by the rules of international law.

Belligerent occupation, being a stage of war, directly succeeding the stage of invasion, (*ad hoc*), is considered a crime of aggression and illegal act from the point of view of international law as we conclude from the following :

1.—The well known legal doctrine which states that the wrong act does not cause rights.

2.—The theory of fallacy which is considered an important legal theory, means in its sense that what has been based on fallacy must be consequently fallacious.

3.—The link existing between war and occupation put both in the same criterion with respect of the legal adaptation for both, which states that both are illegal.

4.—According to the rule which states that victory does not procreate any rights and No Fruit of aggression, the aggression should not grant any legal right to occupy the other country's territories.

5.—Most jurists consider belligerent occupation an actual state rather than a legal state.

6.—Most jurists condemned cases of belligerent occupation which took place during the last two great wars and considered them as an infringement of the rules of international law and international treaties.

7.—Stemson's doctrine confirms the illegality of any belligerent occupation resulting from an armed invasion.

8.—All international treaties prohibit belligerent occupation by means of using the armed force. They never recognize the legality of occupation or annexing the defeated territories by force.

9.—Belligerent occupation is considered a flagrant violation of the security and sovereignty of the territories of the occupied country; it is also considered an infringement of its political independence.

Having presented the aforesaid principles, it is clear for us to conclude that belligerent occupation has become an illegal act within the international law ; it even comprises a clear crime against peace and world security.

Should we apply the aforesaid principles to the case of Israel's occupation of territories belonging to Arab States after its aggression of 1967, we conclude that such occupation is unlawful as it was condemned by the U.N. resolutions and the world organizations, and also by the works of Jurists of international law.

Consequently, Israel has to take the initiative step in its immediate withdrawal from all the territories it occupies. The international society, represented by the U.N.O. has to implement the necessary measures which compel Israel to withdraw completely and immediately from the Arab occupied territories according to the Security Council Resolutions No, 242 issued on November 22nd, 1967. Free jurists of international law, all over the world, in all its universities and scientific institutions should shoulder the responsibility of showing off the illegality of Israel's occupation of the Arab territories and the extent of Israel's violation of the customary and conventional rules of the international law, a fact which may consequently lead to the domination of the logic of force and the perdition of the rules of law.

CHAPTER 2

The Legal Effects of Belligerent Occupation

These effects can be summarized as the following :

1.—Belligerent occupation does not transmit sovereignty to the occupying country but sovereignty still belongs to the country whose territories are occupied.

2.—Belligerent occupation does not legalize the annexation of the occupied country, therefore the measures taken by Israel to annex the occupied land are both null and void ; such measures of annexation have been condemned by the international law and international organization.

CHAPTER 3

The Imperative Nature of the Rules of the laws of Belligerent Occupation

The Rules of the law of belligerent occupation consist of the texts in chapter three which are derived from the Hague Regulations, beside the articles of section three from the Fourth Geneva Convention dealing with the protection of civilians during the war. Concerning the Rules of the Hague convention, we should mention that they are rules of imperative nature to which all countries must be obliged, as these are considered declaratory to previous customary rules obligatory on Nations.

With regard to the articles of Geneva convention of 1949, we conclude that they are also of imperative nature since the Geneva convention has type of collective treaties and of international validity. The Geneva convention completely equates the U.N. charter which oblige all the nations of the world to its articles even those who are not parties in the charter.

CHAPTER 4

The Rights and Duties of the Occupying Country in Administering the Occupied Territories

The Rules of the law of belligerent occupation recognize that the occupying country have the following rights and duties :

1.—The occupying country may participate in the administration of the occupied territories by means of forming military government. But such government is not valid in case of illegal belligerent occupation.

2.—The occupying state should not oblige civilians in the occupied territories to take oath of allegiance for the occupant, but it can demand them to observe the duty of obeying orders and regulations issued for the re-organization of public life in the occupied territories.

3.—The occupant should not have the right to alter the status of public civil servants, and judges or in any way to apply sanctions or transferring them.

4.—The occupant state has to respect the laws and codes precedent in the occupied territories.

5.—The occupying state - should not - in case of illegal belligerent occupation levy and collect taxes in the occupied territories.

6.—It may be allowable in case of legal military occupation for the occupant army to demand some necessary services, requisitions from the citizens on condition that such services should be paid for.

CHAPTER 5

The Role of Protecting Power in Observing the Welfare of Civilians in Occupied Territories.

A Protecting Power is a neutral state chosen by the occupied state to look over its interests and subjects in occupied territories concerning the protection of civilians residing inside the occupied territories.

The civilian convention considered that the role of the Protecting Power is a (compulsory) obligatory role to which the signing parties are obliged and that they should offer the necessary facilities to aid the Protecting Power to implement its obligations according to the aforesaid convention.

The role of the Protecting Power, in case of its absence, may be replaced by any human organization or the Red Cross International Committee «R.C.I.C.» which is in charge of the welfare of civilians in the occupied territories. We consider it of utmost importance to appoint (assign) a Protecting Power in the Arab occupied territories so as to protect civilians against the serious violations of human rights which are committed by the Israeli troops against the Arab civilians. Also the observation of applying the articles of the civilian convention.

The Protecting Power may be a sort of pressure on the Israeli occupying authorities so as to prevent them from excessiveness in committing their various crimes against the Arab citizens in the occupied territories.

SECTION TWO

Civilian Rights under Belligerent Occupation

The Islamic Law, before the advent of any positive legislations, has brought into the world special rules which ensure the protection of man and the respect of his human rights during peace as well as in war time.

The Koranic verses have urged us to honour man and respect his humanity during the war time even if he was an enemy to the Moslems. Prophet Mohammed (Praise be upon him) ordered his companions and disciples and the whole Mohammedan nation to maintain the human rights and man's basic freedom during peace and war alike, also to respect their enemies and not to expose their life or body or honour to deliberate murder or torture or even ill treatment.

Laws regulating belligerent occupation and the International Declaration of Human Rights, the International Humanity conventions, the International and national laws, the legalists views and the customary precepts between nations, later on, recognized the civilians rights under belligerent occupation.

Such rights may be summed up in the following :

CHAPTER I

Personal Rights

- 1.—The right of life and prohibiting torture and inhuman treatment.
- 2.—The right of respecting individuals, their honour and rights.
- 3.—The right of medical care and facilitating the abundance of victuals.
- 4.—The right of children in welfare and education.
- 5.—The right of free work and prohibiting compelling civilians to work in the service of occupation forces.
- 6.—The right of civilians to remain and their free movement inside the occupied territories, also prohibiting individual and mass deportation of civilians belonging to the occupied territories.

CHAPTER 2

Financial Rights

The occupant is obliged to respect the financial rights of civilians in the occupied territories. It is an established doctrine professed by the Islamic Law and the rules of International Law. Nevertheless, the aforesaid doctrine has some restrictions which may be summed up as the following :

- 1.—The right of expropriating and confiscating.
- 2.—The right to exploit means of communications, its administration and holding its revenues.
- 3.—The right to levy various kinds of taxes.
- 4.—The right to levy tariffs and revenues. But in cases of affecting private property belonging to civilians in the occupied territories, the occupant has to pay them, amends for injuries affecting civilian's property.

CHAPTER 3

Judicial Rights

The Rules of the law of belligerent occupation have been careful in clarifying the judicial rights of civilians living in the occupied territories. These rules have confirmed the following principles and rights :

- 1.—The principles stipulating that penal provisions cannot be retroactive.
- 2.—The principle of proportion between the crime and punishment.
- 3.—The principle of the personality of the punishment.
- 4.—Limiting the punishment of execution.
- 5.—The illegality of arresting or trying, owing to acts or words precedent to the occupation.
- 6.—The necessity of safeguarding the guarantee of a legal trial.
- 7.—The right of sentenced civilians to appeal against sentences passed against them.
- 8.—The right of imprisoned civilians to have fair treatment in case of being sentenced for punishment limiting their freedom.

CHAPTER 4

Rights of Civilians Detainees in the Occupied Territories

- 1.—The right of detainees to enjoy their full civilian rights.
- 2.—The right of detainees and their families to be provided with the necessities of life.
- 3.—The right of detainees belonging to the same family to be reunited in the same confinement (detention camp).
- 4.—The right of ensuring places used for detention.
- 5.—The right of internees (detainees) to practice their religious beliefs, relations. They should be humanely treated. They should also receive medical and sanitary care beside decent food and clothing.
- 6.—Prohibiting compulsory works for civilian detainees.
- 7.—The right of respecting their private properties and financial resources.
- 8.—The right of corresponding with their kinsmen and relatives abroad.

SECTION THREE

Israel's violations of Human Rights in the Occupied Arab Territories.

After Israel's treacherous aggression against three Arab states (Egypt - Syria - Jordan) on June 5th 1967, and occupying territories belonging to these states, the Israeli troops have committed the most horrible violations of human rights in the occupied Arab territories in a manner akin to the horrors committed by the Nazi troops against civilians in territories occupied by the Germans.

These violations comprise war crimes, crimes against humanity condemned by the rules of the International Law, also by jurists and the sentences of the courts of war criminals in Nuremberg, Tokyo, also the national Tribunals.

The United Nations Organization and the various international organizations, also the International Investigation Committees, have condemned Israel for committing these crimes which have greatly affected the world's conscience. These crimes may be summarized in the following :

Firstly : Crimes against civilians in the occupied Arab Territories

1.—Crimes of wilful killing of Arab civilians inside the occupied territories.

2.—Crimes of physical suffering and inhuman treatment of Arab civilians inside the occupied territories.

3.—Crimes of rape, physical suffering, ill treatment and the detention of Arab women inside the occupied territories.

4.—Crimes of ill treating internees and prisoners of war inside the [occupied territories.

5.—Acts of reprisals against Arab civilians inside the occupied Arab territories.

6.—Crimes of violating judiciary rights of Arab civilians inside the occupied territories.

7.—Crimes of compulsory deportation of civilians inside the occupied territories.

Secondly : Crimes of pillage and looting of Public and Private property in the occupied Arab territories.

Thirdly : Crimes dealing with Belligerent Occupation inside the occupied Arab territories :

1.—Crimes affecting the legislations and the judiciary system inside the occupied Arab territories.

2.—Crimes harmfully affecting the economy of the occupied Arab territories.

3.—Crimes affecting the system of education inside occupied Arab territories.

Fourthly : Crimes of Destruction, Demolition and Sabotage :

1.—Deliberate bombing or shelling towns and civilian targets which may cause their destruction.

2.—Deliberate bombing or shelling of institutions of delicate nature such as hospitals, mosques, churches and schools which may cause their destruction.

3.—Deliberate bombing of water and natural resources which may cause their destruction.

Fifthly : Crimes of using arms and ammunitions internationally prohibited such as Napalm and missiles which cause serious physical pains in the injured bodies .

Conclusion

The call for Amending the law of the Belligerent occupation for securing better Protection of civilians under Belligerent Occupations

The Bitter experience of Israel's occupation of Arab territories after June 5th 1967, has proved that there are defects and gaps in the verbal formation of the rules of the law of belligerent occupation in a manner which help nations to realize their Ends during the period of belligerent occupation and to violate the human rights of civilians under the pretexts of implementing the rules of this law. It necessitates to expedite amending these rules to ensure a better security for the civilians in the occupied territories. The gaps and defects in the aforesaid law may be summarized in the following :

Firstly :

The present law of Belligerent Occupation does not distinguish between legal occupation and illegal occupation. In the latter case, the occupying country enjoys the same rights which are enjoyed by the occupying state in the former case despite the illegality of its existence in the occupied territories.

Secondly :

The military necessity is a serious reservation which is brought forth by the rules of belligerent occupation's law and it is used for the interest of the occupying country against civilians in the occupied territories.

Thirdly :

There are numerous defects in the rules of the present law of belligerent occupation which must be avoided. Of such defects are :

1.— Absence of frank text prohibiting the use of modern deadly arms against civilians.

2.— Absence of frank text ensuring the basic general freedoms enjoyed by civilians in the occupied territories.

3.— Absence of frank text protecting resistance movements inside occupied territories.

Fourthly :

The necessity of amending the system of controlling the implementation of applying the rules of the law of Belligerent occupation which deal with the treatment of civilians in the occupied territories.

Fifthly :

The necessity of applying criminal punishments to violations of the rules of the law of Belligerent occupation. We find it necessary to amend the rules of the Belligerent occupation's Law in a manner which evades all defects and gaps mentioned above. We suggest a call for signing annex convention that includes new rules that ensure a better protection for civilians in the occupied territories.

We also demand from the United Nations Organization to issue a new Charter and Declaration that includes the fundamental rights which must be protected for every man during war time and especially under belligerent occupation.

We call on writers of international law all over the world to pay attention to this serious matter. Through their writings they should call for the establishment of an international legal system that ensures the rights of civilians during war time and under belligerent occupation.

مطابع الامرام التجارية

رقم الأيداع بدار الكتب

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