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Industrialisation Under a Foreign Exchange Constraint: Conceptual, Empirical and Current Industrial Policy Issues in Africa and Latin America

by

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I. INTRODUCTION

This study is concerned with examining the acute industrial policy problems faced by the developing countries in Africa and Latin America. For a number of reasons, the industrialization process in these two continents has been much more adversely affected by the world economic crisis since 1979 than that in Asian countries[1]. In many African countries, only 20 per cent or so of their industrial capacities are being utilised. Similarly in Latin America severe and chronic foreign exchange shortages have halted industrial development altogether and led to de-industrialization.

At an analytical level, a main object of this paper is to investigate the relationship between industrial structure, industrial development and the balance of payments in the current circumstances of Latin American and African countries. In relation to industrial policy, the paper is concerned with the central question of how the extant industrial structures in these countries can be modified and developed so as to be compatible with the foreign exchange constraint both in the short to medium term and in the long term in the changed conditions of the world economy.

Section II outlines the international economic context and the broad nature of the external constraints which industrial develop-

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[1]For a discussion of the reasons why the Asian countries like India, China and South Korea have weathered the world recession so much better than the Latin America and African countries, see Singh (1985).

II The International Economy and Industrial Development in Latin America and Africa

II.1

The slow down in world economic activity which followed the second oil-price rise of 1979 and the adoption of contractionary monetary policies in the leading industrial countries, has had devastating effects on the economies of the Third World countries. As Table 1 shows, after the first oil price increase in 1973, there was between 1973-79 only a small trend reduction in the average rate of economic growth of the developing countries, from 6.3 per cent p.a. to 5.2 per cent p.a. Evidently, on average these countries managed to cope with this major economic shock and the consequent disorders which plagued the world economy in the subsequent years reasonably well; indeed, as the last row in Table 1 shows, the developing countries performed better in this respect than the industrial market economies which registered nearly a halving of their long-term trend growth rate during 73-79 compared with the period 1960-73.

However, since 1979, the growth rate in the developing countries has averaged at only 2 per cent, which in view of a population growth of a roughly similar magnitude implies that there has been no rise in per capita GDP at all in the Third World between 1979 and 1983. In fact, in 1982, for the first time since World War II, per capita GDP in the developing countries actually fell; the fall in 1983 was even greater. Although the developing countries have recorded somewhat higher economic growth in 1984, this may not continue as the US boom comes to an end.

Table 1. Population, G.D.P. and G.D.P. per capita in 1980, G.D.P. Growth Rates 1960-73, 1973-79 and 1980, 1981, 1982 and '983. Various Country Groupings.

Country Group	1980 GDP (billions of dollars)	1980 population (millions)	1980 GDP per capita (dollars)	GDP growth rates (Average annual percentage changes) 1960-73	1973-79	1980	1981	1982	1983
Developing countries	2,118	3,280	650	6.3	5.2	2.5	2.4	1.9	1.0
Low income	349	2,174	250	5.6	4.8	5.9	4.8	5.2	4.7
Asia	497	1,971	250	5.9	5.2	6.3	5.2	5.6	5.1
China	284	980	290	8.5	5.7	6.1	4.8	7.3	5.1
India	162	675	240	3.6	4.3	6.9	5.7	2.9	5.4
Africa	52	204	250	3.5	2.1	1.3	1.2	0.5	-0.1
Middle-income oil importers	915	611	1,500	6.3	5.6	4.3	0.9	0.7	0.3
East Asia and Pacific	204	183	1,110	8.2	8.6	3.6	6.7	4.2	6.4
Middle East and North Africa	28	35	800	5.2	3.0	4.2	-2.4	5.5	2.0
Sub-Saharan Africa	37	60	610	5.6	3.7	5.5	3.9	1.1	0.3
Southern Europe	201	91	2,210	6.7	5.0	1.5	2.3	0.7	-0.9
Latin America and Caribbean	445	241	1,840	5.6	5.0	5.8	-2.3	-0.4	-2.2
Middle-income oil exporters	654	494	1,320	6.9	4.9	-2.4	2.4	0.9	-1.7
High-income oil exporters	228	16	14,250	10.7	7.7	7.4	0.0		
Industrial market economies	7,463	715	10,440	4.9	2.8	1.3	1.3	-0.5	2.3

Not available
a. Estimated
b. Data for 1982 and 1983 are based on a sample of ninety developing countries.
c. Does not include South Africa.
d. The estimated 1983 data exclude Angola, the Islamic Republic of Iran, and Iraq.

Source: World Development Report (1984).

In view of their large foreign debts, the Latin American countries have been particularly hard hit by the world economic crisis. In 1983, the GDP in these countries fell by more than 2 per cent, and per capita income by nearly 6 per cent. 1983 was also the third consecutive year of falling GDP in Latin America. Per capita GDP in seven Latin American countries was reduced to 1972 level or below in 1982. For the region as a whole, per capita GDP levels in 1983 were lower than in 1977, and in some countries as low as in the 1960's. Similarly the low income African countries have fared particularly badly during the last five years.

Reduced economic growth has not surprisingly been accompanied by large falls in levels of consumption and employment, and in a number of African and Latin American countries by enormous under-utilisation of industrial capacity and massive de-industrialisation. For example, in a country like Tanzania, which is not untypical of low income Sub-Saharan African economies, manufacturing production fell by more than 25 per cent in each of the years 1981 and 82. Capacity utilisation in industry in 1983 was of the order of 20 per cent. Similarly in Latin America, in the most advanced countries of Mexico and Brazil, there have been sharp falls in industrial output, employment and capacity utilisation since 1981. In Mexico, for example, industrial production had been increasing at a rate of over 6 per cent p.a. between 1977-81. It declined by 2.5 per cent in 1982 and by about 5 per cent in 1983. Real wages fell by almost 25 per cent in 1983.

The central industrial policy issue for these Latin American and African economies is how to arrest their current industrial decline and to restore industrial development to its long-term trend rate of growth.

II.2

It is certainly arguable that in many Latin American and African countries, the economic and industrial decline over the last four years is entirely due to the world economic crisis. The most important channels through which the slowdown in world economic activity since 1979 has affected these economies are the following: (a) a reduction in the demand for their products, particularly commodity and mineral exports; (b) as a consequence of (a), a fall in commodity prices and hence adverse movements in terms of trade; (c) an increase in the real burden of interest and debt service payments, due partly to (a) and (b) and partly to an enormous increase in interest rates; (d) a reduction in the quantum of aid and other capital flows.

The three factors (a), (b) and (c) above have played havoc with the balance-of-payments situation of the non-oil developing countries.(1) Their combined current account deficit rose to 108 billion US dollars in 1981 and to 87 billion US dollars in 1982, about twice the average annual level during 1977-1980. However, as the IMF's annual report of 1983 pointed out:

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(1) For a full discussion of the nature and the extent of changes in (a), (b) and (c), the reader is referred to Singh (1984).

> 'For the oil importing developing countries, the entire deterioration of the combined current account balance from 1978 to 1981 can be ascribed essentially to these three adverse factors.(1)

Whether the deterioration in the balance-of-payments position of a Latin American or African economy is wholly due to external factors or on account both of internal inefficiencies and external changes, it has far-reaching consequences for all spheres of the economy, real as well as financial. The external payments constraint can become so binding that a country has to curtail not only imports of luxuries or other consumer goods, but also the essential imports needed to maintain the existing levels of domestic production. As the necessary complementary inputs in the form of industrial raw materials, spare parts, etc., can no longer be imported into countries like Tanzania, Mexico or Brazil, the level of industrial capacity utilisation has become very low and industrial production has declined. The dollar value of Mexico's imports fell almost 40 per cent in 1982 and 70 per cent from the first quarter of 1982 to the first quarter of 1983. The fall in the dollar value of Brazil's imports was 12 per cent and 23 per cent in the corresponding periods, on top of an earlier fall in 1982.(2) Similarly in Tanzania, it is estimated that the level of imports today is 25 per cent below its volume in 1970.

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(1) I.M.F. (1983).

(2) World Bank (1984).

Reduced industrial production has adverse effects on other parts of the economy. Thus agricultural production becomes handicapped directly as well as indirectly, by the non-availability of foreign and domestic industrial inputs (e.g. fertilisers), transportation or incentive goods for farmers (which again are mainly industrial). These disequilibria in agricultural and industrial production in turn generate inflation and disequilibrium in government finances. In many developing countries sales and excise taxes on industrial production and import duties are a major source of government revenue, so that the balance-of-payments constraint is both directly and indirectly responsible for the enormous increases in budget deficits or the public sector borrowing requirements with these countries are experiencing.(1) Taking the Tanzanian example again, it has been estimated that if industry was operating at a normal level of capacity utilisation instead of its present low level, sales and excise tax revenues would be doubled, which would not only eliminate the current fiscal deficit, but also make a sizeable contribution to the capital account.(2)

In considering the present and future prospects of industrial development in the Latin American and African countries and in the formulation of industrial policy, an important factor to bear in mind is that the current world economic crisis may not simply be a

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(1) This is the familiar distinction between a 'cyclical' and a 'structural' budget deficit which is often made with respect to budget deficits in the US and other advanced countries. Unfortunately the IMF invariably ignores such distinctions in relation to the developing countries.

(2) See JASPA/ILO (1982).

temporary phenomenon; but instead herald a long-term deceleration in the expansion of world economic activity. There are a number of extremely important factors which suggest that the world economy may grow much more slowly in future than it did in its golden age of 1950-73.(1) The Latin American and African countries have to contend with the probability that the rate of growth of the world economy during the next decade may not be significantly greater than it has been between 1973 and 1983 (which at 2.5% p.a. is less than half the rate recorded during 1950 to 73). The crucial consequence for the developing countries of the expected long-term deceleration in world economic growth is that world trade will expand much more slowly than in the period 1950 to 1973 when the world exports of manufactures increased at a historically unprecedented rate of 10 per cent p.a. Moreover, the slower growth of world economic activity is likely to mean that the adverse movements in the terms of trade which the developing countries have experienced during the last decade will not be reversed. Thus the external constraints on industrial development in the Latin American and African countries will continue to remain as severe in the foreseeable future as they have been in the recent past.

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(1) See Kindleberger (1982); Armstrong, Glynn and Harrison (1985).

III Industrial Crisis and Industrial Policy Choices in Africa and Latin America: Case Studies of Tanzania and Mexico

Although there is an acute industrial crisis both in Africa and Latin America, the level and past history of industrial development in the two continents is rather different. In order to bring out more clearly the nature of the difficult industrial policy decisions facing the African and Latin American countries today, we shall examine closely the specific experience of one country in Africa (Tanzania) and one country in Latin America (Mexico). Any sensible policy analysis requires that the present problems of industrial development in these economies should be considered in a longer term perspective.

III.1 Tanzania

As in most other Sub-Saharan African economies, the overall level of industrial development in Tanzania is very low. Even before the onset of the present industrial crisis in the late 1970's, industry accounted for only about 10 per cent of GDP and employed less than 1 per cent of the total force. A large part of the industry which exists has been established after the country's independence in the mid 1960's. This fledgling industrial development has been hard hit by the continuing foreign exchange crisis of the last 6 years.

Tables 2 to 4 brings out the current plight of Tanzanian industry. For various reasons,(1) the more reliable data pertain

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(1) See Bienefeld and Singh (1979).

to 'large-scale' manufacturing, i.e. firms employing 10 or more workers; such firms account for nearly 75% of total manufacturing production. Table 2 shows that between 1977 and 1983, the manufacturing value added in constant prices has fallen by nearly 50 per cent. Table 3 gives data on industrial capacity, volume of physical production and capacity utilisation for selected industries. Two observations may be made with respect to this table. First, the level of capacity utilisation in the beer and cigarettes industry has remained relatively high in the 1980's. The main reason for this is that these two industries are the main revenue earners for the government and have therefore been accorded preference in the allocation of foreign exchange: Second, despite the low level of capacity utilisation, capacity in a number of industries has continued to increase in the 1980's, thus resulting in even greater capacity underutilisation. This paradoxical situation arises partly from the time-lags inherent in the completion of investment projects and partly from the fact that by and large foreign aid is provided for creation of new capacity rather than for activation of existing capacity.

Table 4 shows that the value of Tanzania's manufactured exports is very small, only $65.3 million in 1984. This compares with a figure of approximately $450 million for Tanzania's total exports in that year. The table also shows that between 1980 and 1984, the Tanzanian manufactured exports had fallen by more than 50 per cent in current prices.

Table 5 indicates the nature of the foreign exchange

TABLE 2 TANZANIA: VALUE ADDED IN LARGE SCALE MANUFACTURING[1]/
(T. Shs millions at constant 1976 prices)[2]/

	1977	1981	1982	1983
GRAND TOTAL	1,888.1	1,345.0	1,089.3	992.3
CONSUMER GOODS	1,036.9	631.4	542.3	494.8
Food & Food Products	472.1	224.3	232.8	211.6
Beverages	63.4	43.8	112.3	104.1
Tobacco	89.7	41.7	34.8	31.7
Textiles	285.6	289.1	162.3	147.5
Apparel	126.0	32.6		
INTERMEDIATE GOODS	680.0	613.6	437.8	398.1
Tanneries & Leather Products	27.2	40.3	49.0	44.5
Wood & Wood Products	57.7	58.4	34.1	30.9
Paper & Paper Products	33.9	26.6	60.1	54.6
Printing & Publishing	57.7	51.0		
Industrial Chemicals, Petroleum Products, Pharmaceuticals and Fertilizer	237.3	127.1	137.8	125.2
Rubber Products	96.0	121.9	32.3	29.3
Plastic Products	26.3	20.6	15.6	14.2
Glass Products & Building Material	21.2	51.8	46.9	42.6
Iron & Steel	63.9	40.3	62.1	56.8
Metal Products	58.9	75.5		
CAPITAL GOODS	122.5	89.7	101.2	92.0
Machinery	60.1	24.5	27.7	25.2
Transport Equipment	62.4	65.2	73.5	66.8
OTHER MANUFACTURING	48.6	10.4	8.0	7.4

Source: Ministry of Finance and Planning, Survey of Industries, 1965, Survey of Industrial Production, various years and Economic Survey, 1984.

1/ Firms with 10 or more employees.
2/ Current price figures were adjusted to constant prices with an index developed from a manufacturing GDP current & constant price series in the 1985/1986 Budget Speech by B. P. Mramba, Minister of Industries, page 28.

Table 3: CAPACITY UTILIZATION IN SELECTED INDUSTRIES

Product	Unit	Capacity/year 1976	Capacity/year 1981	Production 1976	Production 1981	Capacity Utilization % 1976	Capacity Utilization % 1981
Textiles	Metres (mill)	90.0	200.0	75.0	95.5	83	48
Cement	Tons (000)	340.0	1,100.0	244.5	390.0	72	35
Beer	Cases (mill)	6.3	6.8	5.3	5.1	84	75
Cigarettes	Number (bill)	4.8	5.5	3.7	3.9	77	71
Paints	Litres (mill)	5.0	5.6	3.2	1.5	63	27
Fertilizers	Tons (000)	105.0	134.0	41.6	69.0	40	51
Shoes	Pairs (mill)	6.0	14.0	4.0	4.0	67	29
Tyres and Tubes	Number (000)	438.0	538.0	375.0	170.6	86	32
Bicycles	Number (000)	-	150.0	-	13.8	-	9
Leather	Square feet (mill)	11.8	32.5	7.8	13.4	66	41
Hoes/Ploughs	Tons (000)	2.0	3.0	1.7	2.5	84	83
Corrugated iron sheets	Number (000)	52.0	43.0	30.0	14.4	58	33
Blankets	Number (mill)	6.0	6.0	0.86	.7	14	12
Garments	Number (mill)	-	1.5	-	.4	-	27
Dry cell batteries	Number (mill)	96.0	96.0	54.8	78.0	57	81
Iron & Steel	Tons (000)	30.0	30.0	12.2	16.5	41	55
Bags	Number (mill)	10.0	10.0	3.7	5.3	37	53
Sugar	Tons (000)	115.0	195.0	-	145.3	-	75
Containers	Number (mill)	63.5	196.0	76.7	80.2	121	41
Chibuku	Litres (mill)	21.7	21.7	11.6	14.2	53	65

Source: Ministry of Industries

Table 4 TANZANIA: EXPORTS OF MANUFACTURES
(US$ millions)

	1965	1970	1975	1980	1981	1982	1983	1984
Food Products	8.9	8.1	11.1	16.9	17.7	7.7	13.7	2.0
Beverages and Tobacco	1.4	6.3	11.9	15.5	21.1	21.4	14.5	9.7
Petroleum Products, Dyes and Paints, Processed Oils and Other Chemicals	4.9	21.7	25.4	33.9	23.3	20.3	17.4	21.3
Textile Yarn and Fabrics	0.9	3.7	12.2	30.9	13.6	13.4	11.1	12.9
Sisal Fabrics	0.9	3.7	11.9	28.1	10.9	12.9	8.3	9.3
Other Processed Minerals and Materials	0.6	1.3	0.7	6.1	3.1	5.1	5.1	3.7
Machinery and Transport Equipment	-	-	-	2.9	3.5	3.4	2.6	2.2
Miscellaneous Manufactures	0.5	0.5	0.7	17.2	4.8	3.1	3.5	4.2
T O T A L	18.1	45.3	73.9	151.5	98.0	87.3	76.2	65.3

Source: Annual Trade Reports, Bureau of Statistics.

constraint faced by Tanzanian industry during the three years 1978-80 which mark the beginning of the industrial crisis. In nominal terms, the foreign exchange allocation to industry in 1979 fell by nearly 50 per cent compared with 1978; although the situation improved in 1980, the total 1981 allocation in nominal terms was at roughly the same level as in 1979. Since then as the overall foreign exchange crisis has deepened, the allocation to industry has progressively declined even further leading to further reductions in industrial production.

It is interesting to observe (col 1, table 5) that in the peak year of 1978, the total foreign exchange cost of Tanzanian industrial production (including raw material and technology imports, payments for management services, etc.) was of the order of 2,200 million Tanzanian shillings, which amounts to over $250 million at the then U.S. dollar/Tanzanian shilling exchange rate. However, the total manufactured exports in that year amounted only to approximately $100 million. Thus before the onset of the current industrial crisis, the Tanzanian industry was a net user of foreign exchange to the tune of $150 million p.a.

The overall performance and efficiency of the Tanzanian industry can only properly be assessed in a longer term perspective when industry was operating at a normal level of capacity utilisation. There is, however, a tortuous academic debate on the long term industrial record of Tanzania.[1] The debate has revolved around questions (a) about which statistical series should be used and issues of statistical methodology, and

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(1) See Bienefeld (1980) and the references contained therein

Table 5 TANZANIA: Granted Allocations of Foreign Exchange for the years 1978-1980 to Different Industrial Sub-sectors (Values in mil. T.shs)

Sector		1978	1979	1980
1.	Textile, knitting and weaving industries	363.62	190.20	237.54
2.	Sisal based industries	11.70	17.95	33.07
3.	Sugar industries	48.20	18.00	22.00
4.	Coffee industries	13.80	8.40	11.83
5.	Tea processing companies	5.30	3.30	9.94
6.	Cashew processing companies	4.62	1.53	2.88
7.	Manufacturers of vegetable oil	64.40	21.60	57.85
8.	Milk, ghee and cheese factories	21.50	12.80	5.60
9.	Tanneries and Hides and skin based industries	9.76	3.28	38.68
10.	Tobacco processing companies	32.80	24.60	23.50
11.	Wattle and Pyrethrum extracting industries	1.77	2.90	2.05
12.	Meat and Fish processing companies	1.20	5.30	4.38
13.	Cement companies	9.60	6.80	7.50
14.	Mining industries	63.80	86.00	31.80
15.	Safety Matches manufacturer	10.70	7.60	19.20
16.	Wood based companies	3.92	4.35	13.60
17.	Assemblies of Bicycles, Vehicles and others	23.00	11.80	11.00
18.	Watch assemblies	-	0.90	1.00
19.	Soft Drink manufacturers and Bottlers	16.79	10.10	20.46
20.	Soap and Detergent manufacturers	135.60	69.40	173.25
21.	Agricultural and Industrial Chemicals	169.80	88.30	87.90
22.	Mosquito Coil Manufacturers	0.20	0.90	2.13
23.	Leather and Rubber based industries	173.20	87.10	147.06
24.	Artificial Leather and Plastic Pr.	68.80	37.70	73.31
25.	Paint manufacturers	19.00	7.20	25.00
26.	Paper container and Paper Product manufacturers	57.90	25.30	56.80
27.	Stationery manufacturers	28.30	10.50	16.00
28.	Printers and Binders	51.30	32.30	34.50
29.	Aluminium and Metal Products Man.	249.80	138.90	199.60
30.	Metal Containers and Utensils Man.	39.30	38.00	83.00

		1978	1979	1980
31.	Body Builders	23.00	9.90	31.70
32.	Electric Equipment Assemblies	226.30	38.30	62.00
33.	Furniture manufacturers	68.09	25.70	15.90
34.	Food Product manufacturers	12.20	23.09	23.70
35.	Drugs and Toothpaste etc. manufacturers	28.80	20.00	20.70
36.	Alcholic Beverages manufacturers	49.30	34.30	61.70
37.	Spares and Components manufacturers	56.70	31.14	71.70
38.	Wire based industries	39.40	17.00	21.00
	Total for Industry	2,203.77	1,172.44	1,760.93

Total 1981: 1,149.84

Source: Ministry of Industry.

more importantly (b) about the appropriate economic criteria for an assessment of industrial performance in a developing country like Tanzania.

Table 6 provides summary indicators of Tanzania's long term industrial performance in the pre-crisis period 1971-78. I agree with Bienefeld's assessment of this record:

'In short the aggregate statistics present a picture of a healthy and positive long-term trend where substantial industrial growth had been achieved with an almost constant capital/labour ratio, and a falling real product wage (labour cost per worker deflated by implicit GDP deflator for manufacturing), together with a declining share of labour costs in value added. For a situation where labour absorption is itself an important objective such a combination has much to recommend it and is in no sense necessarily inferior to a strategy which increases output per worker faster, but at the cost of higher wage costs ... At the macroeconomic level the role played by industry has been dynamic. It has helped to raise productivity in the economy as a whole, has produced substantial amounts of investible surplus, and has developed skills in Tanzanian workers and managers'.(1)

Finally, in considering industrial policy for Tanzania at the present juncture, the overall economic situation must be kept in mind. As I have argued in detail elsewhere (See Singh (1985a)), the Tanzanian economy is currently in 'long-term structural

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(1) Bienefeld (1980).

Table 6 Summary of Trends in Tanzanian Manufacturing[1]

	1970-72	1976-78	Ratio 1976-78 / 1970-72
1. Value added in constant (1966) prices (Shs.m)	536.9	874.3	1.63
2. Employment (000)	51,560	84,819	1.65
3. Capital (Shs.m) Constant (1966) prices	1,049.3	1,833.0	1.75
4. Capital - Output ratio (3÷1)	1.95	2.10	1.08
5. Capital - Labour ratio	20.35	21.61	1.06
6. Output per worker (1÷2)	10,413	10,308	0.99
7. Labour costs as share of value added (%)	41.3	34.3	0.83
8. Real product wage (Shs. per worker)	4,065.3	3,579	0.88
9. Actual real rate of return on capital (%)	21.1	21.0	

(1) Firms employing 10 or more workers.

Source: TISCO

disequilibrium in the sense that the productive economy is unable to generate sufficient exports to pay for the required imports (i) at a socially desired rate of economic growth, at a socially acceptable exchange rate and (iii) at a normal level of current account deficit. This disequilibrium is not simply a short term liquidity or financial problem but one which requires profound changes in the structure of national production, both agricultural and industrial. More specifically, the central task before the Tanzanian authorities is to reduce as quickly as they can the current account deficit to its 'normal' level of 5 per cent of GDP whilst maintaining reasonable economic growth.

In the light of the above discussion, the following seem to be the most important industrial policy questions which face the Tanzania government.

(a) In the short-term, the major industrial policy issue before the authorities is whether to allocate the available foreign exchange for the industrial sector to all existing industries on a pro rata basis, or to concentrate foreign exchange resources on a small number of industries which can then operate at normal capacity.

(b) How much of the industrial sector developed during the golden age is viable in the new international environment even in the medium or longer terms? Which industries should be allowed to survive and to grow and how should the government choose these industries?

(c) Whilst there is massive underutilisation of existing industrial capacity, foreign aid still continues to be provided

for creating new industrial capacity. Although the donors cover the direct foreign exchange costs of the new projects, the indirect foreign exchange costs are not taken into account at all. How should these indirect costs be measured? Clearly, from Tanzania's point of view, with a binding foreign exchange constraint and enormous capacity underutilisation, the first best solution would be that donors should provide foreign aid not for expanding capacity, but for increasing production from the already installed industries. However, in view of the donors' reluctance to do so, they should at least provide both direct and indirect foreign exchange costs of the new projects. The estimation of these indirect foreign exchange costs should also lead to more optimal selection of projects.

III.2 Mexico

III.2.1

In sharp contrast to Tanzania, Mexico has a large industrial economy, one of the third world's largest. As table 7 shows, by 1980, Mexico accounted for more than 10 per cent of total third world manufacturing output. The table also indicates that although the absolute size of Mexico's manufacturing sector is about half that of Brazil, it is bigger than that of India and nearly twice as large as that of Korea.

Table 8 provides data on the recent record of Mexican industry. Excluding oil and considering manufacturing alone, output expanded at a rate of 6.5 per cent p.a. in the oil-boom years 1977 to 1981 (the g.d.p. increased at an even faster rate of over 7 per cent p.a. during this period). When the balance of payment crisis came to a head in 1982, manufacturing production fell by 4 per cent in that year; in 1983, the fall was even greater, over 8 per cent. As table 8 shows, the production of consumer durables has been particularly hard by the crisis; it declined by 10 per cent in 1982 and nearly 15 per cent in 1983. Capital formation in manufacturing which had been increasing at a rate of over 10 per cent p.a. between 1977 and 1981, fell by more than 15 per cent in 1982 and by over 20 per cent in 1983.

Because of the size and sophistication of Mexico's industrial sector, the industrial policy issues which confront the country's policy makers are rather complex. In order to obtain a proper appreciation of these complexities, it is essential to consider Mexico's recent industrial experience in a longer term

Table 7 Ten Developing Countries with the Largest Share of Manufacturing Value Added (MVA) of the Third World*, 1963, 1973 and 1980

1963		1973		1983	
Country	Share of MVA	Country	Share of MVA	Country	Share of MVA
Brazil	17.42	Brazil	20.62	Brazil	22.66
Argentina	13.69	Argentina	13.79	Mexico	10.85
India	13.00	Mexico	10.70	Argentina	9.86
Mexico	9.86	India	8.76	India	8.27
Venezuela	3.59	Turkey	4.18	Republic of Korea	4.46
Turkey	3.46	Venezuela	2.91	Turkey	3.73
Chile	2.97	Iran (Islamic Republic of Iran)	2.76	Iran (Islamic Republic of Iran)	3.02
Peru	2.75	Republic of Korea	2.71	Venezuela	2.61
Philippines	2.73	Philippines	2.36	Philippines	2.51
Egypt	2.08	Peru	2.25	Thailand	2.01
Total	71.55	Total	71.04	Total	69.98

Source: UNIDO (1984)

* Excluding China and a few other Asian socialist countries

Table 8 Index of Industrial Production in Mexico

	1975	1976	1977	1978	1979	1980	1981	1982	1983[p]
General Index of Industrial Activity	68.60	72.10	73.89	81.92	91.10	100.00	108.85	106.95	98.24
Mining[1]	54.66	57.97	62.38	71.28	81.74	100.00	115.32	127.61	123.57
Manufacturing[2]	70.78	74.20	76.26	83.95	92.76	100.00	107.39	103.12	84.85
Consumer Goods	73.17	76.15	79.08	85.20	93.66	100.00	106.78	104.93	98.18
Durables	68.12	71.23	71.50	81.34	91.86	100.00	109.56	97.12	81.88
Non-Durables	74.38	77.36	80.91	86.15	94.09	100.00	106.02	106.87	102.24
Intermediate Goods	69.75	73.89	75.60	83.73	92.45	100.00	107.16	107.65	85.63
Capital Formation	65.52	65.96	66.29	78.62	89.78	100.00	112.66	95.70	72.49
Construction	68.25	71.13	68.97	78.34	88.71	100.00	111.48	109.22	93.26
Electricity	63.65	71.12	78.23	85.22	93.48	100.00	108.22	116.61	117.87
Petroleum[3]	48.70	52.59	57.91	68.12	90.64	100.00	116.71	129.11	115.99

[p] Preliminary estimates based on Jan-Oct figures.

[1] Includes extraction of crude oil and natural gas.

[2] Includes the refining of crude oil and derivatives and basic petrochemicals.

[3] Includes a subgroup mining (STIC 0601) for the extraction of crude oil and natural gas and a subgroup in manufacturing (STIC 3301 and 3401) for refining and basic petrochemicals.

Source: Bank of Mexico

perspective. It is also necessary to examine certain important aspects of the country's industrial structure.

Table 9 summarises the main features of the long-term structural transformation of the Mexican economy during the period 1950-1978.(1) The following aspects deserve particularly attention. One, Mexico is a high growth economy whose trend rate of growth of production over the quarter century 1950-73 has been about 6 per cent per annum. The rate of growth of productivity over the same period has averaged at 3.5 per cent p.a. Consequently, two, the economy has undergone enormous structural change. By 1978, the contribution of agriculture to g.d.p. had falled to a mere 9.2 per cent, although agriculture still employed a third of the country's labour force. Three, manufacturing industry had expanded at a rate of 8 per cent p.a. between 1960 and 1973; by 1978 it accounted for nearly a quarter of the total output and employed about a fifth of the country's labour force.

Table 10 compares the economic structure of Mexico with that of Brazil and Argentina, as well as that of the advanced countries such as Japan, France and the U.S.A. There are notable differences in the structures of the developing and the developed countries in this table, particularly with respect to the share of agriculture in national production and more importantly in relation to the shares of primary commodities in merchandise exports. Of the three Latin American countries, the economic

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(1) The last subperiod 1973-78 shown in Table 9 spans the years of an earlier economic crisis which occurred between 1975 and 1977.

Table 9 Mexico: Output, Employment and Productivity in the Long Term: By Sectors of Activity, 1950-78

(per cent)

	Average annual growth rate[2]				Structure		
	1950-60	1960-68	1968-73	1973-78	1950	1968	1978
Output	5.52	7.12	6.21	3.96	100.00	100.00	100.00
Agriculture	4.52	3.58	1.44	2.58	17.82	12.39	9.21
Mining	1.70	2.20	4.16	2.69	1.70	1.23	1.09
Oil	9.45	8.50	5.32	11.97	1.67	2.66	3.70
Manufacturing	6.02	8.98	6.91	4.37	18.79	22.61	23.83
Construction	7.34	10.02	9.91	4.49	4.18	6.14	7.48
Electricity	12.79	13.04	9.57	7.76	0.22	0.67	0.93
Transport	5.52	6.49	6.78	6.63	2.15	2.05	2.39
Commerce[5]	6.16	7.60	6.43	3.02	27.05	29.78	28.76
Other services[5]	4.81	5.59	5.82	3.17	18.97	15.81	14.93
Government	4.37	8.92	8.32	5.01	6.46	6.61	7.68
Employment[3]	2.70	2.65	2.66	n.a.	100.00	100.00	100.00
Agriculture	1.27	0.22	0.23	n.a.	54.85	39.39	33.06
Mining	3.24	-1.46	-1.55	n.a.	1.0%	0.80	0.59
Oil	5.63	7.20	3.18	6.93	0.37	0.70	0.76
Manufacturing	4.71	5.18	3.34	2.79	12.82	18.90	19.60
Construction	6.12	3.94	4.56	2.99	3.01	4.61	5.39
Electricity	5.08	4.38	5.48	6.47	0.28	0.40	0.47
Transport	3.92	2.97	2.87	4.88	2.63	3.04	3.10
Commerce[5]	2.84	3.49	3.32	5.10	9.79	10.60	10.77
Other services[5]	4.47	4.71	4.76	4.43	10.92	15.20	17.11
Government	3.80	6.50	7.00	5.46	4.27	6.37	9.15
					Relative index[4]		
					1950	1968	1978
Productivity	2.75	4.35	3.46	n.a.	100.00	100.00	100.00
Agriculture	3.21	3.35	1.20	n.a.	32.30	31.46	27.58
Mining	-1.76	4.07	5.80	n.a.	256.78	160.60	191.70
Oil	3.62	1.21	2.07	4.71	445.03	379.31	374.62
Manufacturing	1.25	3.61	3.46	1.54	146.61	119.68	118.19
Construction	1.16	5.35	5.12	1.85	138.86	133.13	141.75
Electricity	7.33	8.30	3.87	1.21	79.78	166.19	171.88
Transport	1.53	3.42	3.80	1.67	81.55	67.41	72.12
Commerce[5]	3.22	3.97	3.02	-1.98	276.23	281.01	280.15
Other services[5]	0.33	0.83	1.01	-1.21	173.62	104.01	89.81
Government	0.55	2.27	1.23	-0.43	151.30	103.77	80.47

Notes: 1. The years selected for the different periods correspond to peak points of the economic cycle. 2. Growth rates of output are calculated on 1975 prices data. 3. Employment is defined as the remunerated economically active population. 4. The productivity index is calculated by dividing output per worker employed in each activity by the corresponding national average. 5. Commerce and services include workers in unclassified activities.

Sources: Secretaría de Patrimonio y Fomento Industrial, Dirección General de Política e Inversiones Industriales, *Estadísticas Anuales de Producción y Empleo por Rama de Actividad Económica, 1980*; and Secretaría de Programación y Presupuesto, Coordinación General del Sistema Nacional de Información, *Encuesta Continua de Mano de Obra*, several quarters.

Reproduced from Brailovsky (1981).

Table 10 Indicators of Economic Structure in Developing and Advanced Countries in 1978

	Mexico	Brazil	Argentina	Japan	France	USA
1 GNP per capita (dollars)	1290	1570	1910	7280	8260	9590
2 Distribution of GDP (%)						
(a) agriculture	11	11	13[a]	5	5	3
(b) industry	37	37	45[a]	40	37	34
(c) manufacturing	28	28	37[a]	29	27	24
(d) services	52	52	42[a]	55	58	63
3 Distribution of value added in manufacturing						
(a) food and agriculture	21	15	17	8	13	12
(b) textiles and clothing	13	10	13	7	6	8
(c) machinery and transport equipment	19	30	24	36	35	31
(d) chemicals	14	12	13	11	8	12
(e) other	33	33	33	38	38	37
4 Share of primary commodities in merchandise exports in 1977	71	74	76	3	23	1

Source: Casar and Ros (1984)

structures of Mexico and Brazil are broadly similar with the one major difference that Mexico has a much less developed capital goods industry than Brazil. Taking the machinery and transport equipment industry as a proxy for the capital goods sector, it accounts for only 19 per cent of total manufacturing production in Mexico compared with 30 per cent in Brazil (and 24 per cent in Argentina).

Another indication of the relatively low level of development of Mexico's capital goods industry, compared with the other NICs, is given by Dahlman and Cortes (1984). They compare the 'domestic procurement ratios' - the percentage of capital goods consumption which is supplied locally - for Mexico, Korea, Brazil and India. This comparison for the latest year available showed that Mexico had the lowest ratio (56 per cent), followed by Korea (61 per cent), Brazil (78 per cent), and India (87 per cent). Dahlman and Cortes also note that unlike Korea, Mexico also had a very low export ratio for capital goods. These ratios for the four countries were as follows: India (4 per cent), Mexico (7 per cent), Brazil (18 per cent) and Korea (25 per cent).

During the course of the veritable industrial revolution which has been taking place in the third world countries in the last two decades,[1] they have not only become exporters of manufactures and simple capital goods, but many of them have also themselves become significant exporters of technology. The so-called technology exports of the third world's leading

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(1) See further Singh (1984).

industrial countries have recently attracted a great deal of attention from economists as well as policy makers[1] The technology exports are very important, although by no means, the only indicator of the development of technological capabilities in these countries. There are severe difficulties in obtaining comparable inter-country data in these area, but Lall (1984) has carefully assembled the best available information on technology exports of the leading NIC's; this is reported in table 11. The table shows that in industrial project exports, the leading exporter is India followed at a large distance by Korea and Brazil. In non-industrial civil construction project exports, by far the most important country is Korea followed by India and Brazil. Mexico's performance in these respects is quite poor relative to that of India, Korea or Brazil.

Table 12 provides information on the comparative development of the machines tools industry in the leading NIC's. This key industry in the capital goods sector is rightly regarded as crucial to a country's technological development. The statistics in table 12 again show clearly that the machine tools industry is much less developed in Mexico than in the other countries. Whereas countries like Argentina, Brazil and India export about 10 per cent of their production, the comparable figure for Mexico is less than 1 per cent. Similarly Mexico has the highest import penetration ratio among all the developing countries and

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(1) For an up to date and comprehensive review of the subject, see the special issue of the World Development, 1984, on technology exports of the developing countries.

Table 11. Summary of Technology Exports by NICs (Cumulative Values)*

(U.S. ($ Million)

T.E.	COUNTRY						
	TAIWAN	KOREA	INDIA	MEXICO	BRAZIL	ARGENTINA	HONG KONG
A. INDUSTRIAL							
Industrial Project Exports (Contract Values)	n.a.	[<802]	2,200-2,500	n.a.**	>285	106	-
Direct Investment (Equity Stake)	83	.67	95	238	n.a.	49	1,800
LICENSING, CONSULTANCY AND TECHNICAL SERVICES i. Actual receipts	n.a.	n.a.	322	51	n.a.	0.3	n.a.
ii. Contract values	n.a.	472	[>500]	n.a.	>357	22	n.a.
B. NON-INDUSTRIAL							
CIVIL CONSTRUCTION PROJECT EXPORTS (Contract Values)	n.a.	43,953	6,024	984	>4,284	696	-
DIRECT INVESTMENT (Equity Stakes)	18	256	21	n.a.	252	n.a.	n.a.

Symbols: n.a. signifies positive but not available

\- signifies nil

Figures in square brackets are estimates

Source: Lall (1984)

* For a full discussion of the definition and qualifications to the figures, see Lall (1984).

** It is estimated that the total value is very small.

Table 12 Measures of market penetration for machine tools, by country 1966-1967, 1970-1971, 1974-1975 and 1979-1980[a]

Countries and territories	*Exports as a percentage of the sum of gross output and imports, annual average*				*Imports as a percentage of the sum of gross output and imports, annual average*			
	1966-1967	1970-1971	1974-1975	1979-1980	1966-1967	1970-1971	1974-1975	1979-1980
Developing countries and territories								
Argentina	4.61	4.59	11.68	13.63	35.59	43.96	40.89	61.59
Brazil	4.05	5.80	4.16	9.97	36.33	51.38	53.56	30.59
China[b]	-	2.61	1.26	5.04	46.68	52.74	26.56	24.34
India	1.32	4.34	7.10	11.06	59.41	43.26	27.24	29.10
Mexico	0.14	0.07	-	0.88	93.16	92.89	98.65	92.89
Republic of Korea	-	...	...	3.95	100.00	...	...	71.33
Singapore	...	...	...	28.99	...	...	...	74.97
Taiwan Province	...	13.12	27.23	49.01	...	39.17	60.32	32.69

a. All calculations based on data in current U.S. dollars

b. Excluding Taiwan.

SOURCE: UNIDO (1984)

territories reported in table 12; this ratio has remained at over 90 per cent since the mid 1960's. These data provide further evidence of the paradox that despite the very large absolute size of the Mexican industrial sector (the second largest among the third world countries) and its very rapid rate of growth over the three decades 1950-80, its capital goods industry and technological capacity appear to be considerably less developed chan that of the comparable NIC's.

Finally, it is important to note the important role of the foreign multinationals in the Mexican capital goods industry. Dahlman and Cortes (1984) point out that a very large part of the Mexican capital goods exports are done by subsidiaries of multinational companies. Power machinery and equipment constitute 25 per cent of these exports (most of which consist of internal combustion engines exported by multinationals to the U.S. and European plants). Another 8 per cent are commercial vehicles (most of which go to Latin America), and another 10 per cent are office machinery (mostly typewriters exported by multinationals to Latin America). Dahlman and Cortes note that relatively few exports are by Mexican firms, and these appear to be concentrated in equipment for the petroleum industry, glass making machinery and some agricultural equipment.

III.2.2.

The weakness in Mexico's industrial structure outlined above have been directly linked with the balance of payments crisis which engulfed Mexico in the last two years of President Lopez

Portillo's period of office. As table 13 shows, Mexico's current account deficit increased from $1.6 billion in 1977 to $4.8 billion in 1979 to $6.7 billion in 1980 and to a colossal $11 billion in 1981. This was despite the nearly 30 fold increase in oil revenues, which rose from $0.5 billion in 1976 to $14.4 billion in 1981 (see the bottom half of table 13).

There were three main reasons for the huge increase in the current account deficit over the period 1977 to 1981: (a) a massive increase in manufactured imports which quadrupled in nominal value and tripled in terms of volume over the five years 1976 to 1981; (b) relatively poor performance of non-oil exports, which was in important part due to the U.S. and world recession; (c) interest payments on public debt which also increased rapidly. Of the three, (a) was an avoidable act of public policy while (b) and (c) were less so since they depended to a large extent on the U.S.A. and world economic activity and interest rates. An analysis of (b) and (c) lies outside the scope of the present paper, but (a) is of direct concern here since it was intimately connected with the imports of capital goods.

In the early 1950's, the ratio of imports to g.d.p. in Mexico was around 15 per cent. During the phase of import substitution industrialisation in the 1960's, the economy, and particularly the manufacturing sector, performed exceptionally well, and by the early 1970's the import ratio had fallen to 10 per cent of g.d.p. The crude elasticity of manufactured imports with respect to growth of manufacturing production between 1960 and 1973 was appreciably less than 1, about 0.8. However, during 1977-81,

Table 13 The financial performance of the Mexican Economy 1976-1981

(All figures in thousands of millions of U.S. dollars except where stated otherwise)

	1976	1977	1978	1979	1980	1981
% change in GDP deflator	19.6	30.4	16.7	20.3	28.7	26.3
Balance of payments current account	-3.069	-1.623	-2.693	-4.856	-6.761	-11.7
a) Balance of goods and non-factor services	-1.190	0.360	-0.310	-1.542	-1.808	-4.1
b) Balance of factor payments	-1.879	-1.983	-2.383	-3.314	-4.953	-7.6
Memorandum						
Interest on external public/debt	1.266	1.542	2.023	2.888	3.958	5.5
Oil exports	0.543	1.029	1.799	3.861	10.305	14.4
Merchandise imports	5.427	5.150	7.376	11.380	17.174	23.1
% change unit value in dollars of manufactured imports	7.4	8.0	10.5	12.7	15.2	17.0
% change in unit value in dollars of oil exports (dollars)	8.4	6.7	0.5	47.2	55.2	8.0

1/ Provisional figures

2/ Figure is for all imports

Sources: Sistema de Cuentas Nacionales de Mexico. SPP, Informe Annual de Banco de Mexico, various years.

which saw a quantum leap in imports, imports as a percentage of g.d.p. increased by 5 per centage points and the elasticity of manufactured imports with respect to manufacturing production increased to 4. Even with a large increase in oil exports, such an elasticity was in the long run unsustainable.(1) It is also interesting to note that despite (or as some would say because of) the enormous increase in imports the rate of growth of manufacturing production during 1977-81 was only about 6.5 per cent per annum; the latter figure is lower than the corresponding rate of growth of g.d.p. and equally importantly, it is also less than the long-term trend rate of growth of manufacturing production over the period 1960-73, which had been about 8 per cent p.a. (see table 9).

What were the reasons for the large increase in imports between 1977 and 1981? This is a complex subject which has provoked a major debate among students of the Mexican economy (see in particular Brailovsky and Barker (1983), Schatan (1981), Jimenez Jamies and Schatan (1982), Taylor (1983)). Nevertheless, an extremely important factor in the surge in imports during the boom years 1977-81 was the large increase in imports of capital goods. Although on account of import liberalisation during these years, there had been a massive increase in import penetration in the consumer goods sector (including food, the share of consumer goods in total imports over the period 1976 to 1981 increased from 5 per cent to 10 per cent), 90 per cent of Mexico's imports during the economic boom consisted of capital and intermediate goods. As

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(1) This issue is fully explored in Brailovsky (1981).

table 14 shows, the deterioration in the trade balance of this sector played a very important role in the balance of payments crisis of the economy. It will be recalled from table 13, that the total current account deficit in 1981 was $11 billion; the deficit in the capital and intermediate goods in that year was nearly $10 billion. In 1982, as a consequence of the balance of payment crisis and a very sharp recession in the economy, Mexico ran a trade surplus of nearly $7 billion, but the capital and intermediate goods were in deficit by $5 billion.

The above analysis of the relationship between industrial structure, the balance of payments and the economic crisis in Mexico leads to an identification of the following significant industrial policy issues.

(i) In view of the continuing balance of payments crisis, in the short term, Mexico's industrial policy makers have no choice but to greatly reduce their imports and to pursue vigorous import substitution policies so as to maintain as high a level of industrial production as possible.

(ii) As the Mexican economy moves out of the slump, it seems to me that even in the medium and longer term, the country will only be to achieve the socially necessary higher rates of economic growth if there is a very substantial reduction in the import elasticity of industrial production.

In principle, one could argue that an external balance at a high rate of economic growth can instead be maintained by greatly expanding Mexico's oil or non-oil exports. However, as Brailovsky (1981) has demonstrated, the former would both be infeasible and

Table 14 Trade Balance and the Balance on Capital and Intermediate Goods: 1975-83

(U.S. dollars millions)

	1975	1976	1977	1978	1979	1980	1981	1982	Enero-1982	Junio 1983
Trade Balance	-3 637.0	-2 644.4	-1 054.7	-1 854.4	-3 162.0	-3 178.7	-4 510	6 744.5	105.7	6 463.3
Balance on capital and intermediate goods	-2 100.9	-1 987.4	-1 755.1	-2 234.6	-4 052.4	-6 506.8	-9 922.6	-4 911.9	-2 899.2	- 703.4

Source: NAFINSA/UNIDO (1984).

an unwise course of action. The required growth of non-oil exports on the other hand will be extremely difficult, if not impossible, to achieve in a slow-growing world economy.

As noted earlier, towards the end of the oil boom in 1981, the crude import elasticity of output in the Mexican manufacturing sector had been of the order of 4. Even if the non-oil exports were to expand to some degree, the crucial task before Mexico's policy makers would be to help reduce this figure over time to its long-term trend value of less than 1 which was achieved in the 1960's when the Mexican industry grew exceptionally fast. Such reductions in import elasticity would require far reaching changes in Mexico's productive structure. The development and expansion of the capital goods industry must constitute an essential component of this transformation.

(iii) What are the best ways of achieving the necessary development of Mexico's capital goods industry? Should the industry be exposed to more foreign competition to foster economic efficiency or should there be further import substitution?

IV. Traditional approaches to Industrial Policy under a Foreign Exchange Constraint:

The foreign exchange constraint is a well-trodden ground in the literature on development economics. In this section, we shall review some traditional approaches to the subject:

(i) The concept of 'retained value'.

(ii) The import content of production and exports.

(iii) The concept of domestic resource cost per unit of foreign exchange (DRC) and the concept of effective rate of protection (ERP)

As noted in the Introduction, the last two concepts are particularly favoured by the World Bank and are widely used in their industrial policy analysis. In addition recently, the IMF economists have employed the DRC criterion as a basis of their 'supply-side' approach to economic adjustment in the African countries. In this section, the definitions, the underlying theoretical bases and the applicability of these concepts to the current industrial policy problems of countries like Tanzania and Mexico will be examined; some limitations of these measures, as conceived within their own theoretical paradigim, will also be noted.

IV. 1 The 'Retained Value' of Exports and Production

The notion of 'retained value' has been used by a number of economists to examine the contribution made by exports (particularly mineral exports) to economic growth in the developing countries. Various definitions of 'retained value' have been invoked by different authors; however, in a recent taxanomic survey, Brodsky

and Sampson (1980) have clarified the underlying economic basis of the concept. Essentially 'retained value' refers to that part of the country's value added in production or exports which accrues to the domestic factors of production i.e. it is net of payments (managerial salaries, interest, profits etc.) accruing to foreign factors of production.

Following Brodsky and Sampson, in the context of a developing economy with a mineral exporting industry which is wholly or partly foreign owned, consider the following production function:

$$Q = f(L_d, L_f, K_d, K_f, M_d, M_f, R) \qquad (1)$$

where Q is quantities produced

L is labour services

K is capital services

M is intermediate inputs

and R is the rent associated with the activity, normally accruing to the government in the case of the mineral exports)

d and f refer respectively to domestic and foreign factors factors of production.

In terms of market prices of the output and factor inputs, the total factor payments, V, can be expressed in terms of the following identity:

$$V \equiv L_d^* + L_f^* + K_d^* + K_f^* + M_d^* + M_f^* + R^* \qquad (2)$$

where * denotes payments to a factor in value terms.

Now V is also equal to Retained Value (RV) + Non-Retained Value (NRV)

where $RV = L_d^* + K_d^* + M_d^* + R^*$

and NRV is the rest of the terms in (2).

Thus RV measures the total returns to the domestic factors of production plus the total funds accruing to the government for the operation of the foreign controlled domestic industry. With respect to the foreign exchange constraint, it is more usual to use a variant of RV to indicate foreign exchange availability as a consequence of the operation of the industry

$$RV' = RV + k_f$$

where k_f represents the net flow of foreign investment.

Note that $K_f = I_f^* + aK_f^*$

where I_f^* = foreign equity investment

K_f^* = value of gross profits

a = proportion of gross profits which is invested

and $0 < a < 1$.

Many authors have provided empirical estimates of the 'retained values' in specific mineral exporting industries in the developing countries. The main use of the concept is to show that the value of a developing country's exports or the rate of growth of these exports is by itself a misleading indicator of the contribution of exports to either foreign exchange availability or to economic growth. Thus the fact that the developing countries achieved very high rates of growth of exports during the 1960's and 1970's does not mean that they had thereby managed to relax the foreign exchange constraint. The advocates of the 'retained value' concept imply that the rate of growth of the retained value of these exports was considerably lower.

Similarly Brodsky and Sampson suggest that the normal measures of terms of trade understate the deterioration in the relative prices suffered by the developing countries in recent years. They persuasively argue that 'retained value terms of trade' should be calculated as follows: Index of retained value per unit of exports (rather than unit value of exports) relative to the index of unit value of imports.

Although the notion of retained value is clearly useful in many instances, it does not appear to be particularly helpful in relation to several of the industrial policy issues outlined in section III. Recall the Tanzanian case, where a major issue is which of the existing industries is viable in the medium and long terms. The calculation of retained values' for the various production and exports industries will not be an adequate guide to assessing their long-term viability. The main reason for this is that the concept of retained value has no numeraire, no normalisation factor, so that one cannot sensibly compare 'retained values' of different industries. Parenthetically, it is also worth noting that in several of the empirical studies of retained value, it is used as a static measure (at a point of time) of the contribution of a production or an exporting activity. However, changes over time are the essence of industrial development in a developing country and it will be much more useful to measure changes in retained value over a number of years. In principle such measurement is no doubt possible, but the data problems for any large scale microeconomic exercise would be horrendous.

However, much the more important difficulty with using the 'retained values'as a criterion for industrial investment is the lack of any proper economic accounting of inputs. Suppose the 'retained values' in different industrial activities are normalised by total value added in the relevant industry (i.e. RV/(RV + NRV)). This would permit inter-industry comparisons of retained values, but as an investment criterion, it would not be an economically meaningful one. To illustrate, it would clearly not be sensible to prefer an industry with a high retained value ratio to total value added if this industry uses a rather large amount of scarce inputs compared with another industry with a smaller retained value ratio but also a lower use of scarce inputs.

IV. 2 The Import Content of Domestic Demand, Production and Exports

A related concept to that of 'retained value' and empirically more tractable is that of the import content of domestic demand, production or exports. The direct and indirect import content of total production can be calculated from the input-output table. More information is required to measure the direct and indirect import content of exports, although in many studies it is assumed to be the same as the import content of total production of an industry.

Again what is useful is not the import content of an industry's production at a point of time, but changes in it over a period of time. In general in developing countries one would expect the import content of production to be progressively reduced as import-substitution takes place. A recent UNCTAD study of a cross-section of 50 developing countries in 1970 showed that a one per cent increase in GDP will decrease the ratio of imports to value added by 0.276 per cent.

It is important to emphasise that a high import content of an industry does not necessarily imply that the industry in question is inappropriate for the economy. However, changes in import content over time of different industries give useful information about their relative efficiency from the point of view of the economy as a whole, particularly with respect to relieving the balance-of-payments constraint. As a comprehensive investment criterion or as a guide to changes in industrial structure, this measure is flawed for the same reason as the retained value concept: there is no reference to scarce economic inputs.

IV. 3 The Concept of Domestic Resource Cost

The concept of Domestic Resource Cost (DBC) which is widely used as an investment criterion in orthodox applied economic analysis does explicitly take into account scarce inputs and the foreign exchange constraint in the production process. Very simply, the rationale for the calculation of DRC$_i$ for different industries may be expressed as follows. The export of a commodity implies earning of foreign exchange and the domestic production of a tradeable commodity implies saving of foreign exchange. This gross earning or saving of foreign exchange is usually made possible only by spending some domestic resources and also foreign exchange. The net earning or saving of foreign exchange is the difference between gross earnings/saving, and the cost of foreign exchange. The domestic resources are the value of labour, return on capital, values of non-tradeables inputs. These values should be taken at shadow prices of these factors. Domestic resources cost per unit of net foreign exchange earned or saved is given by the ratio:

$$\frac{\text{(Value of labour + Interest + Domestic Capital Depreciation + Return on Capital + Non-traded Inputs)}}{\text{(Outputs in world prices - Imports - Domestic Tradeable Inputs - Imported Capital Depreciation)}}$$

The denominator should also be expressed in foreign currency at the shadow exchange rate.

The DRC's, as defined above could be used as an ex ante device for the 'optimal' allocation of foreign exchange resources to different industries. They have however, also been used ex post to indicate the misallocation or the waste of resources which may have occurred particularly as a consequence of protection and other government induced distortions in the economy. In view of their widespread use

and their obvious direct application to industrial policy questions in Africa and Latin America outlined in Section III, it is necessary to carefully examine the theoretical basis of this concept.

The concept of DRC essentially represents a statement of the comparative costs doctrine in a static general equilibrium framwork. In other words, it is believed that the optimal pattern of production and trade for a country is determined from the comparison of the opportunity cost of producing any given commodity with the price at which the commodity can be imported or exported. In equilibrium no commodity is produced which could be imported at a lower cost and exports are expanded until marginal revenue equals marginal cost. With full employment, perfect competition, and the usual restrictions on production conditions, the opportunity cost of a commodity in equilibrium is equal to its market price. When such conditions are not met and there exist various market and government policy induced distortions (tariffs, etc.), use of suitable shadow prices for inputs and the exchange rate is recommended in the calculation of DCRs.

However, even within its own framework, the sophisticated exponents of DRCs like Bhagwati (1978) recognise a number of its limitations. Thus Bhagwati notes that the demonstration of wide differentials in DRCs among different activities is not equivalent to arguing that the losses therefrom must also be correspondingly large: (1) the shift of resources from a higher DRC activity to a lower DRC activity may run into increasing costs; and (2) the expansion of output in the lower DRC activity may run into reducing output prices (as, for example, exports are increased to clear the supplies).

Moreover, in general equilibrium analysis, three further complications in relation to the use of DRCs as indicators of resource misallocation are admitted. First, as resources are shifted from a number of activities to other activities, in a shift to optimal equilibrium (e.g., free trade for a small country), the associated shift of prices may imply that, at the changed techniques, an activity that was higher DRC than another in the suboptimal equilibrium may become lower DRC than the other in the optimal equilibrium. Second, evaluation of the activity at, say , c.i.f. international prices in the suboptimal equilibrium may have to give way to its evaluation at f.o.b. prices in the optimal equilibrium. Third, the relative expansion and contraction of different activities in the optimal equilibrium as compared to the suboptimal equilibrium cannot be forecast in general from the mere examination of the relative DRCs in the initial suboptimal equilibrium, in consequence[1].

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(1) See Bhagwati (1978), Chapter 5.

In addition it should be observed that even with all the strict assumptions of the orthodox international trade theory, the DRCs for all industries would only be equalised for an economy in equilibrium. In practice even such an economy would experience disequilibrium and would continuously be adapting itself to changing technical know-how, factor supply changes, variations in international prices, and so on. The variations in DRCs that would be observed in any one cross section at a single point in time cannot therefore be regarded as evidence of resource misallocation.

Notwithstanding all these conceptual difficulties with the use of DRCs, and despite noting a whole series of equally serious empirical problems in their measurement, Bhagwati nevertheless goes on to assert that the DRCs 'do give a reasonable clue to the wide variations in the social returns to different activities on the system'. Despite strictures against the 'overenthusiastic users' of DRCs, he goes on to suggest that 'the process of careful qualification and scepticism should not be carried too far'.

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(1) See Bhagwati (1978), Chapter 5.

IV.4 The DRCs and the IMF's supply side Approach to Balance of Payments Adjustment

A novel use of the DRC concept is being made by the IMF economists in their so-called supply-side approach to economic adjustment in the balance-of-payments constrained African countries. Large devaluations are routinely imposed on these economies as a part of the IMF conditionality. However, the economic rationale for such enormous exchange rate variations (of the order of 300 to 400 per cent) is rather thin for countries which are essentially exporters of primary commodities with low income and price-elasticities of demand and where the Marshall-Lerner conditions are often unlikely to be satisfied(1). In response to such criticisms, the IMF economists(2) put forward an alternative supply-side justification for currency devaluations and derive the required level of devaluation for a country from the calculations of DRCs of different agricultural and industrial activities. In this approach, the exchange rate is viewed not as an instrument for increasing the demand for a country's tradeable goods, but to enhance the profitability of supply.

Following Hussain and Thirlwall (1984), the IMF's method may be described as follows. The basic idea is to calculate the competitiveness of each export by relating its international

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(1) For a further discussion of these issues, see Singh (1984a) and Branson (1984)

(2) See in particular Nasheshibi (1980) and IMF reports on countries like Sudan and Tanzania

value added to domestic cost. First the international value added (V) is measured as the difference between the value of (exportable) output and the value of imported inputs used in production, both measured in domestic currency:

$$V = (P_x X - P_m T) \qquad (1)$$

where X is output. P_x is the world price of output in domestic currency, T is the quantity of imported inputs, and P_m is the price of imported inputs in domestic currency.

Secondly, a coefficient of competitiveness (C) is defined as the ratio of the international value added (converted into foreign currency) to the cost of domestic inputs used in its production:

$$C = \frac{Vr}{P_d D} \qquad (2)$$

where D is the amount of domestic resources used in production (non-traded goods and factors of production). P_d is the price of domestic inputs and r is the exchange rate (the foreign price of domestic currency).

The coefficient, C, is thus a measure of the foreign exchange obtained (or saved in the case of import substitutes) per unit of domestic resources used in the export sector, i.e. it is a measure of DRC. However, the IMF economists regard this coefficient as an implicit exchange rate, which can be compared with the existing exchange rate. If $C < r$, the product is considered as not profitable at the existing exchange rate, and vice versa. In

this way, export and import substitute activities can be arranged on a profitability scale, and according to the supply side argument, the appropriate devaluation is the one that goes down the scale far enough to ensure the profitability of traditional exports, as well as (perhaps) to encourage marginal export activities and import substitutes. It can be seen from equation (2)that $C < r$ implies $V/P_d < 1$, and devaluation to increase 'competitiveness' relative to the exchange rate, must raise V by more than in proportion to P_dD.

At a conceptual level, the IMF's use of DRCs in the above supply side approach to exchange rate determination is seriously flawed. As Hussain and Thirlwall (1984) rightly argue, this is for too powerful reasons. First the index of competitiveness (C) itself depends on the exchange rate (r) to the extent that P_x, X, P_m, T, P_d and D are all responsive to a change in r. Devaluation (i.e. a fall in r) may reduce C, and indeed reduce C by more than the fall in r. Secondly, reducing r to make some goods more profitable may reduce Vr/P_dD for other goods which are already profitable at the existing exchange rate and reduce overall foreign exchange earnings per unit of domestic input. At the very least, a discriminatory approach may be required which recognizes differences in supply elasticities between commodities as well as differences in other variables determining C.

IV.5 DRCs and the Effective Rate of Protection

As seen earlier in IV.3, within its own framework, the proper use of DRCs for guiding resource allocation in disequilibrium economies requires that DRCs should be measured at the shadow prices of scarce inputs and at shadow exchange rates. In practice, this is hardly ever done and DRCs are often estimated by using market prices of labour, capital, etc. and the existing exchange rates. As Bhagwati and Sirinivsan (1975) have shown that if market prices rather than shadow prices are used in the calculation of DRCs, there is a rigid relationship between the concept of the Effective Rate of Protection and DRC.

$$\text{Thus DRC} = \frac{V_j}{V_j^*}$$

$$\text{ERP} = \frac{V_j}{V_j^*} - 1$$

$$\text{Therefore DRC} = (\text{E RP} + 1)$$

Where V_j^* is the value added in domestic currency in the process at international prices, V_j is the value added in the process in domestic currency at domestic prices and r is the exchange rate.

V DRC's and other Industrial Performance Indicators: Estimates for Mexico, Zimbabwe and Tanzania

In this section we shall present the practical applications of the DRC's and other industrial performance indicators to one country in Latin America (Mexico), and two in Africa (Zimbabwe and Tanzania). As noted earlier, DRCs are most often used by the World Bank in their industrial policy analysis for developing countries.

V.1 Mexico

Recently in the wake of the economic and industrial crisis in Mexico, the Ministry of Commerce has carried out a comprehensive investigation of industrial protection and industrial performance in Mexico. This investigation follows the standard World Bank methodology (as enunciated by Balaasa and others) and provides estimates of effective rates of protection, the DRCs as well a certain other indicators at the four-digit level in order to guide future industrial policy. The DRCs have been calculated on the basis of market prices and are therefore directly related to ERPs; in fact they emerge as by-products of the study of effective protection. The results for a selection of industries are reported in table 15.

The table contains a very large amount of information which requires explanation. Col. 1 shows whether the industry in question (at the four digit level) is dominated by small enterprises (those employing 1-100 employees), medium sized enterprises (those employing 101-250 employees) or the large

TABLE 15. Basic Indicators of Efficiency of Manufacturing Activities in Mexico 1984

	Type of Firm Small, Medium, Large			Origin of Capital National, Foreign, Public			DRC	Profitability of Exports	Price Competitiveness	Export Coefficient	Import Coefficient
11. Milk + Meat											
1101 Meat + Cows			x			x	1.256	-96	-18	.0123	.0002
12. Fruit + Vegetables											
1201 Fruit and Vegetables (dehydrated)			x	x			.738	26	31	.8595	.1401
13. Wheat											
1301 Flour Wheat	x			x			.502	84	57	.0000	.0000
14. Tortilla Flour											
1412 Tortillas	x			x			.455	84	45	.0000	.0000
15. Coffee											
1512 Soluble Coffee+ Tea			x		x		.690	40	36	.0236	.0048
16. Sugar											
1602 Brown Sugar	x			x			.627	48	39	.0000	.0000
17. Fat + Oil											
1701 Vegetable fat + oil		x		x			.532	59	44	.0001	.0337
1801 Animal Food		x			x		.204	78	47	.0015	.0633
1901 Chocolate	x			x			.902	34	22	.0293	.0000
2002 Alcoholic Rum			x		x		.889	24	9	.0649	.0000
2111 Beer			x	x			.594	57	38	.0173	.0003
2201 Nonalcoholic Beverages			x		x		.459	58	58	.0008	.0001
23. Tobacco											
2311 Cigarettes			x		x		.565	58	53	.0000	.0000

TABLE 15. (continued)

	Type of Firm Small	Medium	Large	Origin of Capital National	Foreign	Public	DRC	Profitability of Exports	Price Competitiveness	Export Coefficient	Import Coefficien
24. Weaving and knitting of Soft Fibres											
2432 Cashmere			x	x			.823	20	0	.0000	.0334
26. Other Textiles											
2612 Rugs, Mats			x	x			.862	6	8	.0153	.0375
27. Clothing											
2702 Jumpers	x			x			1.010	-37	-6	.0000	.0000
28. Shoes++ Leather											
2821 Shoes		x	x	x			.800	39	7	.0001	.0000
31. Paper + Carton											
3121 Paperbags		x		x			.738	59	24	.0063	.0000
32. Printing + books											
3201 Newspapers + Journals			x	x			.678	29	30	.0288	.0166
34. Basic Petrochemicals											
3401 Basic Petrochem. Products			x			x	.624	66	50	.0621	.4316
3601 Fertilisers			x			x	.274	90	63	.0108	.1861
37. Synthetic Resin + Artif. Fibre											
3711 Artificial Fibre			x	x			1.597	-110	-16	.0431	.0734
3801 Medicinal Products			x		x		.480	74	41	.0394	.0780
3901 Soaps and Detergents			x		x		.795	18	22	.0003	.0060
4001 Insecticide		x	x		x		1.212	-89	0	.0118	.0631
41. Rubber Products											
4111 Vulcanisation of Tyres	x			x			1.687	-230	-56	.0021	.0947

TABLE 15. (continued)

	Type of Firm Small	Medium	Large	Origin of Capital National	Foreign	Public	DRC	Profitability of Exports	Price Competitiveness	Export Coefficient	Import Coefficien
4201 Plastic articles	x	x	x	x			1.587	-290	-36	.0003	.0378
4601 Steel Plates			x			x	1.115	-72	-2	.0062	.0193
4713 Metals made of Sinc, Tin + Lead		x		x			1.362	-130	-13	.6520	1.0907
4911 Gas and Water tanks made of Metal			x	x			1.331	-87	-28	.0265	.0465
5112 Machinery + equipment for Beverage Industry	x			x			1.215	-96	-16	.0116	17744
5211 Industrial Electrical Machinery + Equipment			x	x			1.088	-51	0	0.529	1.0311
5401 Radio, television, + record players			x	x			1.410	-380	-50	.0052	.2197
5501 Car batteries			x		x		1.054	-77	-16	.0144	.2936
5601 Cars			x		x		1.507	-610	-31	.0276	.1149
5901 Machinery + Equipment for photography etc.		x			x		1.159	-34	18	.0774	1.1624

Source: Ministry of Commerce, Government of Mexico.

enterprises (those employing 251 or more employees). Occasionally, it will happen that the larger part of the industry's output comes not from one kind of enterprises (say small) but both small and medium sized enterprises. Column 2 provides similar qualitative information on the ownership of the enterprises in the industry - whether the industry has predominantly foreign enterprises, public enterprises or private national enterprises. Column 3 reports estimates of the DRCs in 1984: in line with the methodology outlined in the last section, the greater the figure, the lower the relative efficiency of the industry. In column 4, the profitability of exports, the negative sign indicates greater profitability of the domestic market and the positive sign suggests greater profitability of the export market. The estimates in this column are based both on the information on the level of effective protection accorded to the industry as well as any export subsidies which the industry receives. The price-competitiveness indicator in column 5 shows whether domestic prices have increased faster than foreign prices since the bench-mark year 1978: a positive sign suggests a lower rate of growth of domestic prices relative to foreign prices and a negative sign indicates the opposite. The export coefficient in column 6 shows exports as a proportion of total sales (in both cases weighted averages for the years 1978 to 1984 are used). Column 7 gives similar information about imports: it gives imports as a proportion of total domestic production for the product.

Thus to illustrate, the second row in table 15 shows that in industry 11.1 (meat and cows), large, publicly owned firms account

for the bulk of the industry's production. The value of DRC at 1.256 is rather high suggesting that it costs more than a unit of domestic resources to earn or save a unit of foreign exchange in this industry, i.e. this activity is less efficient than similar activity abroad. Column 4 indicates that there is a large bias (96%) against exports. Column 5 shows that domestic prices in this industry rose by 18% more than those abroad since 1978. The figure for the export coefficient indicates that 1.23 per cent of the industry's output was exported and the last column suggests that imports constituted only 0.02 per cent of domestic production.

The table provides data only for selected industries. In order to provide a full coverage of Mexico's industrial sector in a manageable form, under each heading normally only one (but in some cases, a small number of) four-digit industries have been included. The DRC estimates reported in table 15 are very much along the lines that one would expect. Basically the values of DRCs are low in the light, consumer goods industries (food, drink, tobacco, textiles, leather etc) and are high (greater than one) in capital goods industries, steel, chemicals, machinery, automobiles etc. The lowest DRC in 1984 is recorded for industry 1801, animal feed; the highest value of DRC is 1.50 in the car industry.

What implications follow from this analysis for Mexico's industrial policy? Taking into account all of Bhagwati's caveats noted earlier, those in the World Bank and the Mexican government who accept the DRC criterion to any degree, must conclude from table 15 that the Mexican capital goods industries should not be given resources to develop further and that instead resources

should be reallocated to consumer goods industries with low DRCs. Within the analytical framework of DRCs, such resource shift should lead to a more optimal industrial structure for the country. However, for reasons which will be discussed in section VI, such a policy conclusion is unacceptable as it will lead to a dynamic misallocation of resources and do irreparable damage to economic and industrial development in Mexico in the medium and the long term.

V.2 Zimbabwe

Except for the Republic of South Africa, Zimbabwe is the most industrially developed country in the Sub-Saharan Africa. A large part of this industrialisation took place under a highly protectionist economic regime following the declaration of UDI by the white settler government in the mid 1960's. When the country gained independence under a black majority government in 1980, the government turned to the World Bank for assistance for the rehabilitation and development of the industrial sector. In response to this request, the Bank commissioned an important report on Zimbabwean industry - the so-called Jansen report. This report used the DRC framework and carried out a detailed microeconomic analysis of a large sample of Zimbabwean manufacturing firms. The sample consisted of 122 firms in 10 broad industrial groups. The sample was biased towards larger firms and the sample firms accounted for 65 per cent of Zimbabwe's gross manufacturing output. The main results of the Jansen report for ten groups and 33 manufacturing products are summarised in

table 16.

Column 1 of table 16 indicates the percentage share of each group and activity in total value added in manufacturing, valued at international prices. The nominal protection coefficients are shown in column 2. As the last row shows, the average nominal protection for Zimbabwean manufacturing was very low: only 9 per cent. However, it varied between industries; in household electrical equipment, it was 44% in 1981 and in heavy metal equipment, nominal protection was 33%. Column 3 shows effective rates of protection: these were on average considerably greater than nominal protection rates, the (weighted) mean effective rate of protection for the manufacturing industry as a whole being 33 per cent (see last row of table 16). Column 4 provides estimates of the DRCs (of which more below). Column 5 shows capacity utilisation which at an average of 83 per cent in 1981 was very high by developing country standards, let alone those of African industry. Column 6 indicates labour productivity and column 7 the average wage rate.

The Jansen report recognises that in the calculation of DRCs, domestic factors of production (land, labour, capital) should be calculated 'at their social opportunity cost'. However, for various reasons no shadow prices were used: "For labour, it was assumed that the wages paid reflect opportunity costs - and thus labour costs in social prices do not diverge from labour costs in private prices". This is despite the fact that Zimbabwean economy suffers from very considerable open and disguised unemployment. Similarly for capital, the report states that the 'social rate of

TABLE 16. Zimbabwe DRC's and Other Industrial Performance Indicators 1981.

Group/Product	VA Share	NCP	ECP	DRC	Capacity Utilisation (%)	Gross Output/ Employee (Z$ 000)	Ave. Wage (Z$)
I. FOODSTUFFS	21	0.94	0.86	0.88	88	27	2471
1. Slaught, Process of Meat	7	0.93	0.73	0.69	85	30	
2. Grain, Animal Feeds	6	0.96	1.02	1.03	100	31	
3. Bakery Products	1	1.00	1.04	0.70	61	20	
4. Dairy Products	3	1.00	1.04	1.11	92	17	
5. Sugar Ref, Confectionery	2	0.83	0.44	0.83	88	26	
6. Other Food Products	2	0.95	0.83	0.74	10C	44	
II. BEVERAGES AND TOBACCO PRODUCTS	10	1.00	1.04	0.88	79	20	3495
1. Beer, Wine & Spirits	6	0.89	0.88	0.66	82	24	
2. Soft Drinks	1	1.11	1.48	1.32	75	13	
3. Tobacco Products	3	1.09	1.19	1.13	76	24	
III. TEXTILES INCLUDING COTTON GINNING	11	1.18	1.74	1.28	81	23	2074
1A. Cotton Ginning, Textiles (including CMB)	9	1.17	1.79	1.30	82	28	
1B. Cotton Ginning, Textiles (excluding CMB)	4	1.39	2.54	1.72	79	18	
2. Knitted Products	2	1.24	1.50	1.20	76	11	
IV. CLOTHING & FOOTWEAR	8	1.19	1.28	1.05	86	12	1954
1. Clothing	3	1.27	..43	1.32	84	10	
2. Footwear	5	1.14	1.21	0.92	87	13	
V. WOOD AND FURNITURE	3	1.21	1.38	1.33	65	5	1425
1. Sawmilling, Wooden Products	2	1.19	1.35	1.33	62	4	
2. Furniture	1.	1.23	1.45	1.32	69	8	
VI. PAPER, PRINTING & PUBLISHING	3	1.32	1.90	1.87	87	20	4391
1. Paper Products	2	1.33	2.30	2.40	92	22	
2. Printing & Stationery	2	1.30	1.52	1.36	79	17	
VII. CHEMICAL PRODUCTS	20	1.08	1.29	0.94	88	38	4196
1. Fertiliser, Insect.	7	0.99	1.17	0.83	96	48	
2. Soaps, Det. Toilet Preps	5	1.05	1.10	0.81	100	50	

TABLE 16: (continued)

Group/Product	VA Share	NCP	ECP	DRC	Capacity Utilisation (%)	Gross Output/ Employee (Z$ 000)	Ave. Wage (Z$)
3. Pharmaceuticals	1	1.13	1.36	1.19	93	42	
4. Paints, Indus. Chemicals	2	1.24	1.57	1.17	75	24	
5. Rubber Products	2	1.23	1.56	1.21	70	35	
6. Plastic Products	2	1.25	1.54	0.95	78	21	
VIII. NON-METALLIC MINERAL PRODUCTS	5	1.12	1.25	0.98	85	12	2196
1. Pottery		1.03	1.13	1.07	64	4	
2. Glass & Glass Products	1	1.07	1.20	0.68	94	17	
3. Cement & Bricks	3	1.15	1.29	1.08	84	13	
IX. METAL & METAL PRODUCTS	18	1.20	1.77	2.41	78	22	3329
1A. Steel & Non-Ferrous (including Zisco)	9	1.18	2.03	3.62	86	30	
1B. Steel & Non-Ferrous (excluding Zisco)	4	1.15	2.23	2.69	90	53	
2. Heavy Metal Equip.	2	1.33	1.71	1.41	68	13	
3. Light Metal Products	4	1.17	1.35	1.12	65	16	
4. Agric. Implements	1	1.16	1.22	0.91	78	14	
5. Household Elec. Equip.	1	1.44	2.77	2.29	48	10	
6. Indust. Elec. Equipment	2	1.18	1.38	1.09	87	26	
X. TRANSPORT EQUIPMENT	1	1.23	1.49	1.27	70	14	2924
TOTAL MANUFACTURE	100	1.09	1.33	1.27	83	21	

Notes:

V A Share: Value Added in Social Prices for the Group divided by Value Added in Social Prices for Total Manufacturing.

Gross Output/Employee: Gross Output in Thousands of Dollars per Employee.

Source: Jansen Report, Ministry of Industry and Energy Development, Harare, 1983.

return was assumed not to have diverged greatly from the private rate of return'. It is recognised that the proper calculation of DRCs requires the use of an equilibrium exchange rate. However the report argues that 'the Zimbabwean dollar does not appear to have been significantly overvalued in 1981' - a conclusion which is disputed by many students of the Zimbabwean economy, some of whom believe that the exchange rate was overvalued by as much as 50 per cent in that year (see Stoneman (1985)).

Be that as it may, the report finds that the average value of DRC of 1.27 for Zimbabwean industry (last row, table 16) compares very favourably with those in other African countries. The World Bank studies for some West African economies carried out in the mid 1970's found the average DRC to be 1.95 in Ghana, 1.83 in Cameroon and 1.34 in Ivory Coast. It is therefore at one level surprising that the policy conclusions of the report should be so highly critical of Zimbabwean industrial policy. The final chapter of the report states: 'The losses in efficiency that are occurring under the present set of policies have no offsetting benefits in terms of satisfying other government objectives and have been shown to be extremely costly'. In line with the DRC methodology, it is recommended that foreign exchange should be allocated on the basis of DRCs: firms with relatively low DRCs should be rewarded by larger foreign exchange allocations, and those with higher DRCs should get less.

For reasons which will be discussed in the next section, the Zimbabwean government would do well to strongly resist such recommendations based on DRC analysis.

V.3 Tanzania

Long-term indicators of industrial performance and efficiency in Tanzania covering the period 1972-78 (the two end years representing normal capacity utilisation) were presented in section III (see in particular table 6). For the period since the onset of the current industrial and foreign exchange crisis in that country in 1979, such indicators are difficult to obtain and even more difficult to interpet. For what it is worth, table 17 provides data on labour productivity and labour costs for the large manufacturing enterprises for the years 1976-83. The table shows a sharp fall in labour productivity in the 1980's; by 1983, value added per worker in manufacturing industry had fallen by more than 60 per cent compared with 1976. However, labour costs per worker had also fallen by a similar magnitude over the same time span.

Table 18 provides data on incremental capital output ratios and the growth of net fixed capital for 20 industrial sectors over the period 1979-81. The ICORs in general suffer from well known limitations(1), but such limitations are compounded in this case by the industrial crisis and the low levels of industrial capacity utilisation. Consequently in many industries ICORs are either negative or plus infinity i.e. fixed assets declined while output went up. It is therefore, difficult to draw any useful conclusions about relative industrial performance from Table 18.

A full-scale DRC exercise has not been carried out so far for

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(1) See Reddaway (1960)

TABLE 17 TANZANIA: EMPLOYMENT, VALUE ADDED AND LABOR COSTS IN MANUFACTURING ENTERPRISES 1/
(1976 prices)

	1976	1977	1978	1979	1980	1981	1982	1983
Value Added (TSh m)	2096	2230	2379	2729	1978	1573	1089	992
Labor Cost (TSh m)	776	754	844	925	777	537	420	378
Labor Cost as a % of Value Added	37.0	33.8	35.5	33.9	39.3	34.1	38.6	38.1
Employment (000's)	78.1	84.2	96.4	105.8	102.3	101.3	101.3	103.3
Value Added/Worker (000's)	26.8	26.5	24.7	25.8	19.3	15.5	10.8	9.6
(Index)	(100)	(99)	(92)	(96)	(72)	(58)	(40)	(36)
Labor Cost/Worker (000's)	9.9	9.0	8.8	8.7	7.6	5.3	4.2	3.7
(Index)	(100)	(91)	(89)	(88)	(77)	(54)	(42)	(37)

1/ Establishments with 10 or more employees.

Source: Economic Surveys, Bureau of Statistics.

Table 18. Tanzania: ICORs (1979-81) and Growth in Net Fixed Capital Employed (1979-81)

Sector	ICOR 1979-80			ICOR 1980-81			Growth in Net F.C. 1979-81 (%)		
	Public	Private	Total	Public	Private	Total	Public	Private	Total
1. Food	+α	0.04	+α	+α	neg	+α	(-0.9)	16.6	(-4.6)
2. Beverages	neg	neg	neg	0.4	11.7	0.6	40.1	58.9	48.2
3. Tobacco	neg	-	neg	19	-	19	88.8	-	88.8
4. Textiles	+α	0.85	+α	+α	neg	-	(33.2)	37.1	(-6.3)
5. Apparel	+α	neg	neg	-	0.2	0.2	(-25.9)	91.5	(78.7)
6. Leather	0.16	0.12	0.15	9.8	0.3	5.4	116.2	21.9	153.0
7. Wood	neg	0.12	1.04	+α	0.2	+α	(-10.9)	14.2	(-0.6)
8. Paper	+α	14.3	0.6	+α	neg	+α	(-12.9)	10.2	(-2.4)
9. Printing	2.5	0.3	0.7	1.6	0.1	0.8	47.8	7.6	22.3
10. Chemicals	0.03	neg	0.5	neg	+α	+α	(-4.9)	17.5	4.0
11. Rubber	+α	neg	+α	+α	+α	+α	neg fixed assets	23.1	negative
12. Plastic	+α	+α	+α	+α	neg	neg	(-11.2)	(-7.3)	(-8.5)
13. China/Glass	+α	1.8	1.8	+α	1.8	1.8	(-10.0)	267.9	217.0
14. Cement	698.0	0.8	140.2	0.5	0.2	0.5	68.4	13.7	66.8
15. Iron/Steel	neg	-	neg	0.8	-	0.8	30.9	-	30.9
16. Metal Prods.	+α	2.2	2.5	+α	neg	neg	-8.5	69.1	55.3
17. Non-Electric. Equipment	neg	neg	neg	neg	neg	neg	-	94.2	32.5
18. Elec. Equipment	0.5	0.3	0.3	neg	neg	neg	28.7	61.0	44.4
19. Trans. Equipment	neg	0.2	0.9	3.5	0.6	1.8	136.0	54.8	103.5
20. Other	+α	0.3	0.1	+α	neg	+α	(-0.8)	20.4	1.4
TOTAL	0.08	1.5	0.68	0.12	neg	0.42	3.0	44.9	15.6

neg: negative

+α : fixed assets decling but output goes up

Data in current shillings.

Source: Government of Tanzania.

the Tanzanian manufacturing industry. However to deal with the balance of payment crisis, the Government of Tanzania prepared its own Structural Adjustment Plan (SAP) in 1982, which it has been implementing ever since without any assistance from either the IMF or the World Bank. As a part of the SAP, the Ministry of Planning undertook an important and very sensible investigation of the manufacturing industry which was of a rather different kind than the calculation of DRCs. Detailed quantitative and qualitative studies at a microeconomic level were prepared for each large industrial firm, paying particular attention to various constraints on its growth, including the foreign exchange constraint. To illustrate the nature of these studies with respect to the analysis of the use of foreign exchange, some examples are given below(1).

The Tanzania Electrical Goods Manufacturing Company Ltd (TANALEC), a parastatal firm, set up with Norwegian assistance, produces transformers and switchgear. Most of the raw materials are imported from National Industries (Norway) who also provide the management and technical consultants. The project design had postulated that domestic production of transformers would save foreign exchange, as a percentage of imported price, as follows:

50 KVA	14.5	percent
100 KVA	9.1	"
250 KVA	16.6	"
500 KVA	30.9	"
750 KVA	33.0	"

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(1) These illustrative case studies have been culled from SAP's industrial sector reports. I am grateful to the Ministry of Planning for permission for consult these studies.

The above figures, however, are based only on the direct foreign exchange costs: they do not include the technical fees (3 per cent of sales) and management fees (4.46 per cent of sales). The SAP estimates that if these indirect foreign exchange costs are taken into account, the foreign exchange savings from local production became negative for all ratings below 500 KVA; at 500 KVA, savings are only 15.2 per cent of the imported price and at 750 KVA, they are 17.6 per cent of the foreign price. However, since most transformers manufactured by the company are of less than 500 KVA, there is a net foreign exchange loss from domestic manufacture.

Another parastatal company Steel Co (a subsidiary of Alum Africa Limited) produces cold-rolled steel sheets. Its foreign exchange costs of inputs per ton of steel billets was estimated to be 2696 T shillings. The cost of directly importing steel billets was 2299 shillings in 1982. Thus even excluding management fees, costs of spares etc., the SAP study estimates that there was no foreign exchange gain from local production.

In the production of steel pipes by Steel Co, the SAP study found that there was a marginal foreign exchange saving from domestic production if only direct foreign exchange costs are considered. However, of the indirect costs, the inclusion of management fees alone (which worked out at 2.7 per cent of sales price) would make the foreign exchange savings negative for all sizes of pipes.

Similarly in Galco, another parastatal subsidiary, which

produces galvanised roofing sheets, the SAP study estimated the import content per ton of sheets to be 5583.4 T shillings. The C.I.F. cost of imported sheets was5359 T shillings per ton, which produced a net foreign exchange dissaving of 224.4 shillings per ton of local production. The SAP study noted that some savings may be made from importing thinner sheets, but nevertheless, if indirect foreign exchange costs (e.g. management fees) were taken into account, domestic production by Galvco would still yield negative value added.

It is, however, important to note that in all the above examples, of negative value added at international prices, production was considerably below capacity due to the foreign exchange constraint. Moreover in the case of Tanalec, production had started only in 1980. The results could be rather different at normal levels of capacity utilisation or when there was more opportunity for learning by doing.

VI. DRCs as a Guide to Industrial Policy: A Critique and an Alternative Approach

A number of limitations of the DRC analysis within its own paradigim were noted in Section III. In this section a more fundamental critique will be presented to show why countries like Mexico, Zimbabwe and others in Latin America and Africa should not use the DRCs as a guide to appropriate industrial structure and industrial policy. In other words it will be argued that these countries should resist the World BAnk type advice to favour industries with low DRCs or to reallocate resources from activities with high DRCs to low DRCs. We shall also outline an alternative approach to industrial structure and industrial policy which is more suitable in the circumstances of those economies.

The analytical foundation of the DRC approach is the orthodox proposition that, other things being equal, free trade leads to an optimal allocation and development of the society's resources. The underlying paradigim is that the competitive process produces an 'equilibrium' outcome which is also a desirable outcome. Modern economic theory, even in its neo-classical version, shows both these propositions to be incorrect (See Arrow and Hahn (1971); Sen (1979)). However, at a less rigorous and more practical policy level - the level at which the DRC estimates are used in the developing countries - the following points deserve careful consideration.

It is inadequate, as well as misleading, to judge the 'efficiency' of a country's industry entirely by the difference between domestic costs and prices and international prices. This is for the simple, but extremely important reason, that even in orthodox terms and in equilibrium, international prices reflect existing

'comparative advantage', i.e. the pr ent unequal international division of labour, whereby one group of countries mainly produce and export manufactures and another export primary commodities. This, as Arthur Lewis (1977) has reminded us, is a comparatively recent phenomenon in the perspective of world history and results from a century or more of colonial domination, and the economic, political and military ascendancy of the industrial capitalist countries. If the developing countries were to accept this in the future they would be condemned to perpetual backwardness. In this context, the example of post-war Japan is extremely instructive. In the early 1950's Japan, as a country with a relatively large population and a labour surplus economy, was advised by orthodox economists (using a DRC type analysis) to specialise in labour-intensive manufactures, in which its comparative advantage was thought to lie. However the Japanese rejected this advice and instead embarked on a structural policy whose cornerstone was the purposive and rapid development of steel, chemicals, machinery and other heavy industries, regardless of short-run comparative advantage consideration. It is worth quoting in full Vice-Minister Ojimi of the Japanese Ministry of International Trade and Industry (MITI) for the rationale of that country's industrial policy (OECD (1972)):

> "The MITI decided to establish in Japan industries which require intensive employment of capital and technology, industries that in consideration of comparative cost of production should be the most inappropriate for Japan, industries such as steel, oil-refining, petro-chemicals, automobiles, aircraft, industrial machinery of all sorts, and electronics, including electronic computers. From a short-run, static viewpoint, encouragement of such industries would seem to conflict with economic rationalism. But, from a long-range viewpoint, these are precisely the industries where income elasticity of demand is high, technological progress is rapid, and labour productivity

> rises fast. It was clear that without these industries it would be difficult to employ a population of 100 million and raise their standard of living to that of Europe and America with light industries alone; whether right or wrong, Japan had to have these heavy and chemical industries. According to Napoleon and Clausewitz, the secret of a successful strategy is the concentration of fighting power on the main battle ground; fortunately, owing to good luck and wisdom spawned by necessity, Japan has been able to concentrate its scant capital in strategic industries."

It will be recalled that when Japan embarked on its structural industrial policy in the middle 1950's, it produced only 5 million tons of steel and 50,000 cars per annum while at the time the U.S. produced a 100 million tons of steel and 6 million cars. Parenthetically, it is worth noticing that countries like Mexico and Brazil today produce far larger quantities of steel and cars than Japan did in 1955. Moreover the Japanese cost of producing steel at the time was twice the world price. Yet such is the speed of technological change and learning by doing that it took Japan less than ten years to become the lowest cost steel producer in the world and to export steel to the U.S. By 1970, the Japanese steel production had reached the same level as that of the U.S.

It is also interesting to note that although in the 1950's and early 1960's the Japanese structural policy could perhaps be justified in orthodox infant industry terms, it has been continued ever since. Recent thinking about the appropriate long-term industrial structure for Japan envisages a shift in the 1980's towards 'knowledge-intensive' industries, such as electronic computers, electric cars, new synthetics, communications equipment, the more sophisticated products of heavy and chemical industries, and software. (Singh (1979)).

There are other serious difficulties connected with the use of international prices to indicate economic efficiency which are not revealed by the example of Japan above. These may be best

illustrated by considering the case of rather different kinds of economies, namely the centrally planned economies of the Soviet-Union and Eastern Europe. It is worth reflecting that, on the basis of international prices, these economies would be judged as comprehensively inefficient (domestic prices and costs, at official exchange rates, are far higher than international prices). Yet they have achieved a remarkable degree of industrialisation and economic development. Their share of world industrial production increased by 50% over a twenty-year period from 18% in 1960 to 27% in 1980 (UNIDO, 1984). By comparative international standards, they have achieved high rates of growth of per capita industrial production and consumption, as well as high levels of employment and relatively stable prices. Any useful concept of economic efficiency requires a proper consideration of these broader issues; this is especially so for developing countries where such questions are necessarily paramount.

To sum up, the use of DRC's as a guide to 'optimal allocation' of foreign exchange in the developing countries is flawed for the following reasons:

(a) The DRC is a static concept; it totally ignores the dynamics of the production system.

(b) It ignores linkages between industries and the whole notion of a structural industrial policy.

(c) It assumes that the international prices are equilibrium prices.

(d) Its definition of economic efficiency is inappropriate for developing countries.

An alternative approach to industrial policy would be equally concerned with the scarcity of foreign exchange resources in the developing countries and the need to use them to their maximum advantage, but it would give central importance to elements (a), (b) and (d) above. This neoKeynesian-cum-structural view, which is rooted in the works of Presbisch, Kaldor and others, lays major emphasis on the dynamics of the industrialisation process, on technological change and on changing sectoral productivities and income elasticities for imports and exports. Instead of a theoretical exposition, it is more useful to provide a specific illustration of this approach by considering the case of the Mexican capital goods industry and contrasting it with the DRC analysis.

It will be recalled from section III that the relatively low level of development of the capital goods sector played a significant role in the Mexican balance of payments crisis of 1981-82. How should Mexico foster the development of its capital goods industry? The DRC analysis in the last section showed that DRCs in this sector were generally greater than 1 and much higher than those in the consumer goods industries, thus suggesting a greater allocation of resources towards the latter.

Brailovsky (1981), following what I have called above the new Keynesian-cum-structural approach, has provided a rather different analysis of the Mexican industrialisation process. He used the following international trade indicators for each branch of manufacturing industry:

1. Trade Balance Coefficient: $(X - M)/X+M$ where X is exports and M is imports
2. Ratio of Imports to Domestic Demand: M/D
3. Ratio of Exports to Gross Output: X/Y
4. Import elasticity, e_m, defined as, g_m/g_y where gm is the rate of growth of imports and g_y is the rate of growth of gross output
5. Export elasticity, e_y, defined as g_x/g_y where g_x is the rate of growth of exports.

Brailovsky's results showing long-term evolution of these variables for each industrial branch over the period 1960-79 are reported in tables 19 and 20. The years selected - 1960, 1963, 1968, 1973 and 1979 - represent peaks in economic activity. It is, however, important to distinguish the period 1960 to 1973 from the years 1973-79. In 1975-76, the Mexican economy experienced a severe balance of payments crisis. Consequently, the government had to accept an IMF programme of substantial devaluation and deflation. This programme was implemented in 1976 and 1977. With the big increase in oil production and exports the balance of payments position was greatly improved by the end of 1977 and Mexico embarked on its oil-led expansion. However, at the same time, the government instituted a major change in its commercial policy and greatly liberalised its hitherto stringent regime of import controls. The net result of this turbulence in economic policy and performance was that during 1973 to 1979 there was a significant trend decline in the growth of manufacturing production.

TABLE 19. Mexico: Manufacturing Trade Indicators, 1960-79

	(1) $(X_i-M_i)/(X_i+M_i)$				(2) M_i/D_i				(3) X_i/Y_i				(4) $M_i/\Sigma M_i$				(5) $X_i/\Sigma X_i$			
	1960	1968	1973	1979	1960	1968	1973	1979	1960	1968	1973	1979	1960	1968	1973	1979	1960	1968	1973	1979
TOTAL	-0.759	-0.647	-0.524	-0.537	0.233	0.147	0.141	0.168	0.040	0.036	0.049	0.057	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Clothing and footwear	0.638	0.197	0.479	0.481	0.013	0.018	0.015	0.015	0.057	0.027	0.042	0.042	0.013	0.026	0.022	0.017	0.433	0.183	0.197	0.157
Wood and paper	-0.436	-0.478	-0.661	-0.577	0.064	0.079	0.119	0.102	0.026	0.029	0.027	0.029	0.029	0.053	0.078	0.053	0.081	0.087	0.051	0.047
Rubber and leather	-0.576	-0.235	-0.157	-0.635	0.026	0.022	0.027	0.037	0.007	0.014	0.020	0.008	0.004	0.005	0.006	0.007	0.008	0.015	0.014	0.005
Chemicals	-0.701	-0.553	-0.428	-0.423	0.188	0.162	0.151	0.190	0.039	0.053	0.066	0.087	0.109	0.154	0.166	0.159	0.129	0.206	0.213	0.214
Cement and glass	-0.214	0.076	0.402	0.258	0.061	0.030	0.027	0.047	0.041	0.035	0.060	0.069	0.012	0.009	0.008	0.011	0.056	0.048	0.060	0.061
Basic metals	-0.057	-0.255	-0.431	-0.445	0.078	0.084	0.116	0.226	0.070	0.052	0.050	0.101	0.027	0.052	0.073	0.146	0.178	0.143	0.093	0.186
Capital goods	-0.967	-0.818	-0.699	-0.719	0.527	0.278	0.251	0.255	0.018	0.037	0.056	0.053	0.762	0.635	0.589	0.533	0.093	0.296	0.333	0.289
i) Metal products	-0.676	-0.045	0.053	-0.564	0.136	0.075	0.067	0.109	0.029	0.069	0.074	0.033	0.035	0.038	0.028	0.036	0.050	0.161	0.099	0.034
ii) Mech. engineering	-0.990	-0.946	-0.881	-0.876	0.904	0.596	0.521	0.536	0.045	0.039	0.064	0.071	0.613	0.357	0.275	0.287	0.022	0.046	0.056	0.063
iii) Electrical "	-0.937	-0.864	-0.928	-0.606	0.219	0.263	0.246	0.167	0.009	0.025	0.012	0.047	0.036	0.120	0.128	0.071	0.009	0.041	0.015	0.058
iv) Transportation equipment	-0.910	-0.611	-0.585	-0.792	0.186	0.140	0.199	0.169	0.011	0.038	0.061	0.023	0.031	0.031	0.050	0.036	0.011	0.035	0.012	0.014
v) Automobile industry	-0.987	-0.939	-0.477	-0.475	0.262	0.176	0.172	0.175	0.002	0.007	0.068	0.070	0.047	0.089	0.108	0.103	0.002	0.013	0.122	0.121
Others	-0.900	-0.868	-0.662	-0.720	0.297	0.194	0.142	0.239	0.022	0.017	0.033	0.049	0.053	0.067	0.058	0.074	0.020	0.022	0.038	0.040

Notation: X_i = exports of branch i: M_i = imports of branch i: Y_i = gross output of branch i: $D_i=Y_i+M_i-X_i$ = domestic demand of branch i.

Notes: 1. All indicators are based on 1975 prices. 2. The years selected correspond to peaks in the economic cycle. 3. Production, imports and exports are classified by branch of origin. 4. Excluded from the total and from the branches are the food, beverage, and tobacco industries and the net exports of the in-bond industry. 5. The electrical engineering industry includes household electrical appliances.

Source: Brailovsky (1981).

Table 20 Mexico: Growth of output, imports and exports, by manufacturing branches of origin, 1960-79

(average annual growth rates, in percentages, and elasticities)

	(1)			(2)			(3)			(4)			(5)		
	g_y			g_m			g_x			$e_m = g_m/g_y$			$e_x = g_x/g_y$		
	1960-68	1968-73	1973-79	1960-68	1968-73	1973-79	1960-68	1968-73	1973-79	1960-68	1968-73	1973-79	1960-68	1968-73	1973-79
Total	10.1	8.7	5.9	2.6	7.4	9.4	8.5	15.9	8.7	0.26	0.85	1.59	0.84	1.83	1.47
Clothing and footwear	6.9	8.0	4.7	11.9	3.5	4.6	2.6	17.7	4.7	1.72	0.44	0.98	0.38	2.21	1.00
Wood and paper	8.0	5.8	5.9	10.9	16.1	2.7	9.5	4.0	7.5	1.36	2.78	0.46	1.19	0.69	1.27
Rubber and leather	8.1	5.6	6.9	5.3	10.2	12.7	17.4	13.8	7.5	0.72	1.82	1.84	2.15	2.46	1.09
Chemicals	10.9	11.3	4.0	8.2	9.1	8.6	15.1	16.6	8.8	0.75	0.81	2.15	1.39	1.47	2.20
Cement and glass	8.3	8.9	6.6	-1.2	5.5	15.1	6.4	21.4	9.0	-0.14	0.62	2.29	0.77	2.40	1.36
Basic metals	9.7	7.3	8.4	11.1	15.3	22.7	5.6	6.4	22.0	1.14	2.10	2.70	0.58	0.88	2.70
Capital goods	14.9	9.2	7.2	0.3	5.3	7.6	25.4	18.7	6.2	0.02	0.63	1.06	1.70	2.03	0.86
i) Metal products	12.9	3.8	3.9	3.4	-1.2	16.5	25.6	5.1	-9.1	0.26	-0.32	4.23	1.98	1.34	-2.33
ii) Mechanical engineering	20.9	8.9	9.2	-1.1	-1.5	13.4	18.9	20.1	11.0	-0.20	-0.17	1.46	0.90	2.25	1.20
iii) Electrical engineering	16.0	10.4	8.3	19.3	6.4	1.0	32.3	-5.0	35.7	1.21	0.62	0.12	2.02	-0.48	4.30
iv) Transportation	7.6	9.0	6.3	2.8	3.5	15.5	26.0	20.1	-9.7	0.37	0.39	2.46	3.42	2.23	-1.54
v) Automobile industry	18.7	13.7	8.2	11.3	8.4	11.2	35.9	81.0	8.6	0.60	0.61	1.37	1.92	5.91	1.05
Others	13.3	13.0	2.7	5.7	4.6	13.9	9.5	29.2	9.7	0.43	0.35	5.15	0.71	2.25	3.09

Notation: g_y = average annual growth rate of gross product at 1975 prices;
g_m = average annual growth rate of imports at 1975 prices;
g_x = average annual growth rate of exports at 1975 prices;
e_m = import elasticity in relation to gross output
e_x = export elasticity in relation to gross output.

Source: Brailovsky, (1981)

In the light of the above, following Brailovsky, we may draw the following conclusions from the statistics presented in tables 19 and 20.

i) Considering the period 1960 to 1973, as shown by the evolution of the trade balance coefficient, most branches tended towards balanced trade or surplus during the 1960-68 and 1968-73 periods. Exceptions to this trend include the so-called traditional branches (Clothing and footwear, and Wood and paper) and the Basic metals industry. The Capital goods branches, which were almost pure importers in 1960, increased their coefficient substantially. In general, the foregoing trend was interrupted during the 1973-79 period, and in many branches actually reversed.

ii) Between branches, and in the same branch over time, there seems to be an inverse relation between import elasticity, e_m, and the growth of domestic output. For manufacturing industry as a whole, and for many individual industries, when domestic production grows rapidly, there is a trend decline in long-term import elasticity. Thus as table 20 indicates, for total manufacturing, the import elasticity during the period of highest growth (1960-68) was only 0.26; however, during the period of lowest growth (1973-79) the value of this elasticity increased to 1.59. Thus the greatest reductions in the import coefficient M_i/D_i occur in the most dynamic branches - the Capital goods branches in particular - during the periods of highest growth. For the most dynamic branches, the growth of domestic production exceeds that for

manufacturing industry as a whole to a greater extent when overall growth is higher than when it is lower.

iii) Relative export growth, as between different branches and over time, is directly associated with growth of output. Therefore, the most dynamic branches show higher export growth rates than do the least dynamic branches. As a case in point, the Capital goods branches practically tripled their X_i/Y_i coefficient between 1960 and 1979, registering a faster relative increase than any other manufacturing activity and reach- a level higher than that of the so-called traditional branches.

Taken together, Brailovsky rightly argues, these relationships suggest a pattern of cumulative causation. Higher growth rates of domestic demand seem to lead to significant reductions in the import coefficient and over time to a rise in the export coefficient. This, given other components of the balance of payments seems to make it possible to relax the balance of payments constraint, thus permitting a greater rise in domestic demand. The interruption of this process in the 1973-79 period was partly due to balance of payments problems caused by the rapid and substantial decline in the trade surplus of the primary branches, which could not be offset by the drop in the external manufacturing deficit as a proportion of total manufacturing trade or production; it was also due in part to the import-liberalisation policy which the government implemented in 1978 and 1979.

In contrast to the DRC analysis, the above analysis suggests that the long period of the most rapid expansion of Mexican manufacturing industry (1960-73) may be described as one in which the import substitution process advanced rapidly in the branches of heavy industry producing industrial inputs and capital goods rather than in the light and consumer goods industries. The development of the latter was at best not very dynamic in terms of net exports.

The policy implications which follow from this analysis are also rather different than those emanating from the DRCs. Instead of devoting greater resources to consumer goods industry, within its balance of payments constraint, Mexico should foster a balanced development of the capital good sector on the basis of the growth of internal market and further import substitution. A 'balanced development' implies that proper attention is given to both within and between sectoral linkages as well as to the dynamic long term industrial performance indicators of the kind discussed above.

In the application of this alternative approach to Tanzania, because of the low level of industrial development in that country, the concepts of sector linkages and learning by doing assume even greater importance. However, the exigencies of the current balance of payments constraint also require much greater attention to the proper balance between industrial and agricultural development. In the short to medium term, it is very important that those industries should be preferred in the allocation of foreign exchange which have the greatest linkages with agricultural development and which <u>taken together</u> are not net

users of foreign exchange. Over a five year time horizon, agricultural development must receive much the larger share of the country's foreign exchange resources(1).

Compared with the neatness of the DRC analysis, the analysis suggested above is inevitably messy and complex. Instead of a single magic measure like the DRC, it requires estimation of a number of dynamic performance indicators for firms and industries as well as an empirical study of industrial linkages (not just a mechanical application of some outdated input-output table). In the present industrial crisis in these countries and the unpropitious international economic environment, there is no escape from this more difficult analysis. The Government of Tanzania's detailed S.A.P. studies of the industrial sector, referred to in the last section, are steps in the right direction.

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(1) For a further discussion of this issue, see Singh (1985b).

VII. SUMMARY AND CONCLUSION

This study has been concerned with investigating the present acute industrial crisis in African and Latin American countries and the issues of industrial policy which today confront such economies. Section II examined the relationship between the world economic crisis and the foreign exchange constraint on industrial development in these countries. It was concluded that this constraint was unlikely to be significantly relaxed in the foreseeable future.

Section III studied in greater detail the nature of the industrial crisis for one country in Africa (Tanzania) and one country in Latin America (Mexico). In particular, the relationship between industrial structure, industrial development and the balance of payments was explored. It was concluded that in the case of Tanzania, the central policy issue in the short run is which industries should be favoured with the limited amount of available foreign exchange for the industrial sector; in the medium to long term, the main policy problematic is how the modify the existing industrial structure so as to ensure its compatibility with the foreign exchange constraint. For Mexico, which is industrially much more highly developed, it was noted that the relatively low level of development of capital goods industry played an important role in that country's balance of payments crisis. Two main related policy issues were identified: First, how to permanently reduce the import propensity of industrial production from the extraordinarily high levels reached in the late 1970's. Secondly, what is the best way for enhancing

Mexico's capital goods capability: should it be achieved by greater integration with the world markets or by greater protection.

In Section IV, an analysis of the traditional approaches to industrial policy questions - the concepts of retained value, effective protection and domestic resource cost per unit of foreign exchange earned or saved - was carried out. The limitations of these concepts within their own theoretical framework were noted. Section V presented empirical estimates of DRCs, ERPs and a variety of other industrial performance indicators for Mexico, Zimbabwe and Tanzania. A more fundamental critique of DRCs, which are widely used by the World Bank in the industrial policy analyses in the third world countries, was developed in Section VI. It was concluded that, despite their present industrial crisis, the Latin American and African countries would be wise not to employ the DCRs as a guide to appropriate industrial structure. An alternative neo-Keynesian-cum-structural approach to industrial policy was outlined with its major emphasis on learning by doing, on the dynamics of industrial structure and on the interconnections between industries.

In conclusion it is worth reflecting that with the Baker Plan and the World Bank's Sub-Saharan African Programme, the Latin-American and African countries will be under enormous pressure from the donors to use the DRC's as the leading criterion for future industrial development. The IMF may even use the DRC's as a basis for arriving at the appropriate level of devaluation

required for medium-term adjustment in commodity producing countries. If DRC's become the main basis for industrial policy, there would be very little development of capital goods industry in the more advanced third world industrial countries like Mexico and hardly any industrial development at all in the African countries. As demonstrated in the foregoing sections, the DRC's for capital goods industries in a country like Mexico tend to be higher than those for consumer goods industries and in Africa, they tend to be higher in commodity exports than in industry.

In theory the proponents of DRC's recognise the static nature of the concept but in practice this fundamental limitation as far as industrial development in a developing country is concerned, is often ignored. As a minimum, therefore, when the World Bank's economists present the Ministry of Industry of a developing country with DRC estimates of their industrial sector, they should be asked to provide similar calculations of DRC's three years, five years and seven years previously. The intellectual and policy rationale for requiring such calculations over time is obvious: to assess the relative degree of development of the dynamic economies of scale and learning by doing in different industries. Whereas cross-section estimates of DRC's at a point of time lead to straightforward, but incorrect, policy conclusions, a study of the evolution of DRCs over time will lead to a richer, more appropriate, but a far more complex analysis. The Ministry of Industry of the developing country should seek to supplement this analysis with an examination of changes over time in other industrial performance indicators discussed in this paper

e.g. the trade balance coefficient, the import coefficient, the export coefficient, the rate of growth of productivity. In addition to these quantitative indicators the Ministry should also undertake qualitative studies of industrial performance along the lines carried out by Ministry of Development planning in Tanzania.

These modifications and supplements to the DRCs will greatly enhance their usefulness for industrial policy analysis, but they will still remain subject to their other serious limitation which derives from their inability to take into account the inter-connections between industries. A full consideration of industrial linkages is essential for balanced industrial development. Further, as was noted in the last section, the proper balance between agricultural and industrial expansion both in the short and medium terms is particularly important in the present context of the acute foreign exchange constraint in the African countries.

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