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COUNTRY INDUSTRIAL DEVELOPMENT PROFILE OF THE
REPUBLIC OF SINGAPORE^{*/}

Prepared by the

International Centre for Industrial Studies

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PREFACE

The International Centre for Industrial Studies, Regional and Country Studies Section, has undertaken, under its 1978-1979 work programme, the preparation of a series of Country Industrial Development Profiles. These profiles are desk studies, providing statistical and economic analyses of the industry sector, its growth, present status and future prospects. It is hoped that the profiles will provide analyses of use to programming technical assistance, industrial redeployment and investment co-operation activities.

The profile on Singapore is based on documents, reports and studies available at UNIDO Headquarters. No field survey has been undertaken and some of the data on industry are not up to date.

The views and comments contained in this document do not reflect those of the Republic of Singapore nor do they officially commit the United Nations Industrial Development Organization to any particular course of action.

CONTENTS

<u>Chapter</u>	<u>Page</u>
Summary and Conclusions	6
I. The Economic Structure	7
II. Structure of Manufacturing Industries	17
III. Industrial Development Constraints and Perspectives	32
IV. The Institutional Infrastructure for Industrial Development	37
V. Industrial Development Policies and Measures	41
VI. Technical Assistance	47
VII. Possible Areas of Future UNIDO Co-operation	49

EXPLANATORY NOTE

References to dollars (\$) are to United States dollars, unless otherwise stated.

The monetary unit in the Republic of Singapore is the Singapore dollar (S \$).

Totals in tables may not add precisely because of rounding.

Additional country data is as follows:^{1/}

Area	616.3 square kilometres
Population	2,334,400
Gross National Product	
At current market prices	S\$ 17,405,700,000
Per capita	S\$ 7,456
Trade	
Exports	S\$ 22,985,500,000
Imports	S\$ 29,613,000,000
Foreign exchange reserve	S\$ 11,400,000,000
Employment	958,900
Unemployment	3.6 per cent
Foreign exchange rate (Singapore dollar to US dollar): ^{2/}	
First quarter 1978, average	S\$ 2.3086
Second quarter 1978, average	S\$ 2.3212
1-10 August 1979	S\$ 2.14

^{1/} The following data is taken from the Ministry of Finance, Economic Survey of Singapore, 1978.

^{2/} Data on the foreign exchange rate is taken from the International Monetary Fund, International Finance Statistics. Please note that the currency is floated.

SUMMARY AND CONCLUSIONS

Singapore is, in terms of territory, population and natural resource endowment, a small country. Nevertheless, its stable and efficient Government, geographic position, and availability of sizeable skilled-worker force have served to develop a successful economy based on export-oriented manufacturing industries.

The country has developed labour-intensive industries so well that the unemployment which prevailed some ten years ago has now turned into a state of labour shortage, while the neighbouring countries - ASEAN and others - still have readily available labour. Therefore, the country is strategically shifting from labour-intensive industries, which it encourages to redeploy to suitable neighbouring countries, to technologically sophisticated and high value added production.

For this reason, expansion of industrial infrastructure and manpower development with a view to increasing absorptive capacities for foreign technological and managerial know-how is stressed.

In the pursuit of the country's development efforts, the Government relies essentially on domestic and foreign investment resources. However, the contribution of external assistance to its development efforts, although relatively small in financial terms, represents a significant contribution in that it provides for some selective inputs such as specialized expertise and fellowships which the Government might find difficult to obtain otherwise. Presently, the UNDP is a major source of externally-provided technical assistance. UNIDO's role in developing and implementing UNDP industrial development projects is expected to be selective and to concentrate on development of high technology skills and promoting economic co-operation with Southeast Asian countries.

Chapter I

THE ECONOMIC STRUCTURE

Gross domestic product

In 1978, Singapore achieved a real GDP growth of 8.6 per cent to S\$ 10 billion (at 1968 factor cost). This is the highest growth rate since the economic recession in 1975, and reflects the overall performance of the economy.

Table 1. Real growth rate of GDP
(percentage)

1974	1975	1976	1977	1978
6.3	3.9	6.7	7.8	8.6

Source: IMF, "International Finance Statistics".

The growth is the highest amongst ASEAN countries, although modest compared to its major export competitors, viz., the Republic of Korea and Hong Kong.

Table 2. International comparison of economic growth
(Real growth rates of GDP)

	1975	1976	1977	1978 ^{a/}
ASEAN:				
Indonesia	5.4	7.1	7.5	7.0
Malaysia	0.8	10.8	7.8	7.5
Philippines	5.9	6.9	6.3	5.8
Singapore	4.0	7.2	7.8	8.6
Thailand	6.4	6.2	6.5	8.0
Selected Northeast Asian Countries:				
Hong Kong	2.9	16.9	11.6	10.0
Republic of Korea	8.3	15.5	10.3	12.5

Source: "OECD Economic Outlook December 1978".

^{a/} Preliminary figures.

Singapore's per capita GNP in 1978 of S\$ 7,456.2 (at current market prices) is the second highest in Asia (Japan is the first). Singapore's per capita GNP in 1976 of US \$2,580 was classified as "high income developing country" by the World Bank.

Economic structure

Singapore's economic structure in 1960 and 1976 was as shown in Table 3 below.

Table 3. Structure of GDP

	1960		1976		Average annual growth rate	
	S\$ million	Share (%)	S\$ million	Share (%)	1960-1976	1971-1976
	a/	(%)	a/	(%)	(percentage)	
Agriculture, fishery	74.9	3.8	237.8	1.7	7.5	8.7
Granite quarrying	6.1	0.3	64.8	0.5	15.9	21.8
Manufacture	235.6	11.9	3,345.9	24.2	18.0	20.9
Electricity, town gas, water	49.7	2.5	264.4	1.9	11.0	10.2
Construction	71.7	3.6	1,197.1	8.7	19.2	19.4
Wholesale, retail, restaurant, hotel trade	712.5	35.9	3,790.4	27.4	11.0	15.9
Transport, warehouse, telecommunication	282.8	14.2	1,719.4	12.4	11.9	19.4
Finance, insurance, real estate	145.2	7.3	1,427.7	10.3	15.4	17.8
Ownership of dwellings	79.3	4.0	555.5	4.0	12.9	13.8
Government, military services	55.4	2.8	520.5	3.8	15.0	17.0
Municipal, social, private services	305.2	15.4	1,075.2	7.8	8.2	12.6
Adjustments (minus)	33.1	1.7	384.5	2.7	-	-
Total (GDP)	1,985.3	100.0	13,814.2	100.0	12.9	17.1

Source: Ministry of Finance, "Economic Survey of Singapore".

a/ At current prices.

The manufacturing sector's share in GDP in 1977 was 21.1 per cent,^{3/} the largest sector compared to agriculture, mining, and construction. In 1978, the manufacturing sector expanded by 12 per cent, while it contributed 28 per cent to the overall rise in GDP.

Employment

In 1978, the manufacturing sector employed 270,600 persons, or 28 per cent of the total labour force of 950,900 persons.

Table 4. Employment by sector, 1970, 1977 and 1978 (as of June)

Sector	1970		1977		1978	
	Thousands	Per cent	Thousands	Per cent	Thousands	Per cent
Total	650.9	100	917.7	100	958.9	100
Manufacturing	143.1	22	249.8 ^{a/}	27	270.6	28
Construction	43.1	7	51.5 ^{a/}	6	51.5	5
Trade	152.9	23	212.7	23	225.0	24
Transport and communication	79.1	12	105.6	12	109.2	11
Financial and business services	23.1	4	59.7	6	64.4	7
Community and social services	177.0	27	204.3	22	207.8	22
Others	32.6	5	34.1	4	30.4	3

Sources: "Census of Population, 1970"; "Labour Force Surveys, 1977 and 1978".

^{a/} The employment levels of the manufacturing and construction sectors in 1977 were revised upwards to include foreign workers who only applied for permission to work after the exit control scheme was introduced in 1978.

^{3/} Manufacturing sector's share in GDP in 1977 fell to 21.1 per cent from 24.2 per cent in the previous year. This was due to more significant expansion of construction and services sectors in relative terms.

Trade

From having been largely an entrepot port, Singapore's economy has been reoriented towards industrialization since the late 1950's. The economic policy of industrialization, introduced in 1959, aimed at diversifying the economy into manufacturing and finance in order to reduce dependence on entrepot trade and to create employment opportunities for the then existing high level of unemployment. Entrepot trade, however, remains an important contributor to the country's GDP growth. Its nature, however, has gradually changed from trading in mainly traditional products to re-export of machinery, industrial components and transport equipment accounting for a higher proportion of total re-exports. In 1978, domestic exports made up 58 per cent of total merchandise exports and domestic exports of petroleum products formed 45 per cent of total petroleum exports.

In 1977, the United States, Malaysia and Japan were the major export markets of Singapore's merchandise exports (comprising direct and domestic exports and re-exports), respectively accounting for 15.5, 14.3 and 9.5 per cent of total exports. In terms of export commodities, machinery and transport equipment, fossil and lubricant oil, and industrial components were the main export items, accounting for 24.5, 24.3 and 15.7 per cent of total exports, respectively.

Singapore's trading and industrial-based economic activities are highly dependent on imports. A vastly increased volume of capital goods imports has been required by the rapidly expanding manufacturing sector. In 1978, consumption and capital goods accounted for 15 and 12 per cent of total imports, respectively. In 1977, machinery and transport equipment, fossil and lubricant oil, and consumer goods (fabricated wood and steel, and textiles, etc.) were the main import items, respectively accounting for 26.4, 25.6 and 14.2 per cent of total imports.

Japan, Malaysia and the United States were the main sources of imports, respectively accounting for 17.5, 13.6 and 12.6 per cent of total imports.

A large proportion of the trade gap is offset by capital inflows, and inflows from net transfer payments, net earnings from services, tourism, ship services and repairs, etc., enabling a net overall balance of payments surplus of S\$1.4 billion, and a foreign exchange and gold reserve of S\$ 11.4 billion in 1978.

Table 5. Merchandise exports by main destinations
(in million Singapore dollars)

	1975	1976	1977	Share in 1977 (percentage)
Total	12,757.9	16,265.9	20,090.3	100.0
West Malaysia	1,687.1	1,811.3	2,189.7	10.9
East Malaysia	501.1	669.7	684.2	3.4
United States	1,775.4	2,393.5	3,120.8	15.5
Japan	1,112.9	1,668.8	1,918.1	9.5
United Kingdom	539.8	595.9	646.3	3.2
Hong Kong	937.0	1,266.6	1,474.0	7.3
USSR	126.0	159.5	195.5	1.0
Australia	637.2	831.2	990.6	4.9
China	98.5	95.4	144.7	0.7
Thailand	445.4	486.0	562.1	2.8
Federal Republic of Germany	481.5	647.9	769.1	3.8

Source: Department of Statistics, "Monthly Digest of Statistics".

Table 6. Merchandise exports by main commodities^{a/}
(in million Singapore dollars)

	1975	1976	1977	Share in 1977 (percentage)
Total	12,757.9	16,256.9	20,090.3	100.0
Food, animals	915.7	947.8	1,389.4	6.9
Beverages, tobacco	40.9	48.9	55.2	0.3
Industrial components (except fuel and edible oil)	1,694.3	2,664.7	3,160.0	15.7
Fossil, lubricant oil	3,451.2	3,783.8	4,874.1	24.3
Edible oil	245.5	249.3	474.7	2.4
Chemicals	475.7	609.8	716.1	3.6
Consumer goods ^{b/}	1,086.5	1,328.8	1,602.2	8.0
Machinery, transport equipment	2,894.6	4,106.7	4,917.0	24.5
Miscellaneous products ^{c/}	880.4	1,232.5	1,402.3	7.0
Others	1,073.1	1,293.6	1,489.3	7.4

Source: Department of Statistics, "Monthly Digest of Statistics".

a/ Including entrepot and domestic export. c/ Garments, footwear, etc.
b/ Wood, steel products, textile, etc.

Table 7. Merchandise imports by main commodities
(in million Singapore dollars)

	1975	1976	1977	Share in 1977 (percentage)
Total	19,270.4	22,404.5	25,521.9	100.0
Foods, animals	1,654.4	1,853.3	2,211.0	8.7
Beverages, tobacco	130.3	139.4	150.0	0.6
Industrial components (except fuel and edible oil)	1,229.2	2,023.5	2,278.7	8.9
Fossil and lubricant oil	4,734.1	6,140.9	6,524.2	25.6
Edible oil	242.0	257.8	478.9	1.9
Chemicals	1,119.6	1,116.2	1,319.3	5.2
Manufactured products ^{a/}	3,510.3	3,277.4	3,630.7	14.2
Machinery, transport equipment	4,046.3	5,794.7	6,738.5	26.4
Miscellaneous products ^{b/}	1,331.3	1,534.0	1,764.9	6.9
Others	272.9	267.3	425.7	1.7

Source: Department of Statistics, "Monthly Digest of Statistics".

a/ Wood, steel products; textiles, etc.

b/ Garments, footwear, etc.

Table 8. Merchandise imports by countries
(in million Singapore dollars)

	1975	1976	1977	Share in 1977 (percentage)
Total	19,270.4	22,404.5	25,521.9	100.0
West Malaysia	1,755.6	2,566.7	3,053.8	12.0
East Malaysia	483.0	637.5	412.2	1.6
United States	3,024.0	2,960.5	3,227.2	12.6
Japan	3,254.3	3,590.8	4,474.0	17.5
United Kingdom	956.0	851.2	957.0	3.7
China	682.0	659.0	670.4	2.6
Hong Kong	427.8	536.7	651.2	2.6
Australia	661.5	578.0	644.6	2.5
Federal Republic of Germany	636.2	739.0	880.3	3.4
Thailand	400.3	516.3	571.0	2.2
USSR	18.2	48.9	63.9	0.3

Source: Department of Statistics, "Monthly Digest of Statistics".

In 1978, external trade at current prices increased by 15 per cent to reach S \$52.6 billion. Exports at current prices increased by 14 per cent to reach S \$23.0 billion. Imports at current prices increased by 16 per cent to S \$29.6 billion, reflecting the acute demands for capital and intermediate goods as well as oil.

Consequently, trade deficit rose by 22 per cent in 1978 over the previous year, reaching S \$6.6 billion.

Table 9. Trade balance

(in billion Singapore dollars; exchange rate: US \$1 = 2.1635)

Year	Export FOB	Import CIF	Trade balance
1974	14.2	20.4	- 6.2
1975	12.8	19.3	- 6.5
1976	16.3	22.4	- 6.1
1977	20.1	25.5	- 5.4
1978	23.0	29.6	- 6.6

Source: Department of Statistics, "Monthly Digest of Statistics".

Regional co-operation

In regional economic co-operation, Singapore attaches considerable importance to, and actively participates in, promoting economic co-operation among the countries of the Association of South East Asian Nations (ASEAN), which, as a group, is Singapore's largest trading partner.

In 1977, Singapore's intra-ASEAN trade was US \$4,792.1 million. This accounted for 25.6 per cent of the country's total foreign trade of US \$18,716.9 million. This was the highest rate compared to Malaysia's 17.1 per cent, Thailand's 15.9 per cent, Indonesia's 12.0 per cent, and the Philippine's 5.3 per cent. This situation is explained by the fact that Singapore, with its comparatively high level of industrialization, plays a central role in supplying capital and intermediary goods, such as electrical and precision machines and chemicals to other member countries of ASEAN, which are less industrialized.

The ASEAN Preferential Trading Agreement and the various ASEAN industrial regionalization and complementation schemes add to Singapore's attractiveness as an investment site.

The diesel engine project (for production of engines of a certain size), which was assigned to Singapore as one of the ASEAN Industrial Projects, has encountered serious marketing problems in the other four ASEAN countries, as all have or intend to build plants that would compete with Singapore's planned facility. (Indonesia will allow preferential access to its market only for engines exceeding 500 horsepower; the lower limit of the other three countries is 200 horsepower.)^{4/} Therefore, Singapore maintains that its project, structured as an ASEAN project, would not be economically feasible, at least within the foreseeable future. However, the Government reportedly^{5/} accepted the proposal by a multinational corporation to develop this project on a national basis, with the Government participating in its equity, whereby an internationally competitive plant will first be established under a long-range programme in three phases, which will increase local contents of the components to be assembled in Singapore from 30 per cent at the start to 85 per cent by the mid-1990's, when the plant will be scaled up to commercial production of 5,000 units per year to supply the region. A major factor in this decision will be whether or not the plant will become accepted as an ASEAN project upon its completion, and thus gain preferential access to the other four ASEAN countries.

Singapore is among the countries to which the EEC extends its general scheme of tariff preferences for less-developed countries. Under this scheme, Singapore-made goods qualify for preferential entry to the Common Market if ASEAN local content reaches a certain minimum level. Similar privileges are provided by the United States and Japan.

Singapore has concluded bilateral trade pacts with the Philippines and Thailand. Both agreements called for across-the-board preferential tariff cuts of 10 per cent. Bilateral trade, as well as investment by Singapore firms in Malaysia, continues to grow. In 1976, Malaysia displaced the United States as Singapore's principal trading partner.

Normally no protective tariffs are applied to import-competitive industries, nor are there any quantitative restrictions on imports. It can, therefore, be observed that Singapore is virtually a free port.

^{4/} As was discussed at the ASEAN Ministerial Meeting in 1978.

^{5/} "Business Asia", 13 October 1978.

Table 10. Intra-ASEAN trade by participating country
(in million US \$)

	1973	1974	1975	1976	1977
Indonesia:					
Imports from ASEAN	237.4	360.0	414.9	794.3	889.1
Exports to ASEAN	377.6	644.9	732.1	758.0	1,154.9
Trade with ASEAN (a)	615.0	1,004.9	1,147.0	1,552.3	2,044.0
Total foreign trade (b)	5,941.2	11,266.6	11,872.4	14,220.4	17,081.7
Per cent (a/b)	10.35	8.92	9.68	10.92	11.97
Malaysia:					
Imports from ASEAN	362.5	601.4	535.6	548.4	663.7
Exports to ASEAN	742.7	1,011.7	921.6	1,138.3	1,150.6
Trade with ASEAN (a)	1,105.2	1,613.1	1,457.2	1,686.7	1,814.6
Total foreign trade (b)	5,549.6	8,392.1	7,331.7	9,260.5	10,630.5
Per cent (a/b)	19.91	19.22	19.88	18.21	17.07
Philippines:					
Imports from ASEAN	37.5	78.4	177.9	256.0	272.0
Exports to ASEAN	38.9	35.5	60.5	80.2	124.0
Trade with ASEAN (a)	76.3	113.9	238.4	336.2	396.0
Total foreign trade (b)	3,676.0	6,117.0	5,976.1	6,526.1	7,420.7
Per cent (a/b)	2.08	1.86	3.99	5.15	5.34
Singapore:					
Imports from ASEAN	1,325.3	1,894.1	1,773.9	2,187.5	2,727.0
Exports to ASEAN	910.6	1,403.0	1,512.6	1,802.9	2,065.1
Trade with ASEAN (a)	2,235.9	3,297.1	3,286.5	3,990.4	4,792.1
Total foreign trade (b)	8,810.5	14,182.7	13,508.9	15,663.6	18,716.9
Per cent (a/b)	25.38	23.25	24.33	25.48	25.60
Thailand:					
Imports from ASEAN	55.7	65.8	86.7	120.6	197.5
Exports to ASEAN	309.3	436.8	378.8	510.9	627.6
Trade with ASEAN (a)	365.0	502.4	456.5	631.5	825.1
Total foreign trade (b)	3,595.5	5,588.1	5,397.1	6,552.5	8,104.2
Per cent (a/b)	10.15	8.98	8.64	9.64	10.18
Total intra-ASEAN trade (a)	4,397.5	6,531.4	6,594.6	8,197.1	9,871.8
Total foreign trade (b)	27,572.8	45,545.5	44,086.2	52,223.1	61,964.0
Per cent (a/b)	15.95	14.34	14.96	15.70	15.93

Source: IMF, "Direction of Trade".

A new and rapidly growing source of funds for use in Asia is the Asia-dollar, which is available out of a pool of external dollars and other hard currencies, on deposit mainly in Singapore or raised by Singapore financial institutions. Principal depositors are companies, banks and some Government accounts in the region. Major borrowers are the subsidiaries of the United States and European corporations (frequently without parent or Government guarantees), as well as Asian government agencies.

Chapter II

STRUCTURE OF MANUFACTURING INDUSTRIES

The manufacturing sector^{6/}

In 1977, the manufacturing sector employed 219,112 workers, or 24 per cent of the nation's work force. Value added per worker was S \$20,425; the ratio of value added to output was 25.5 per cent. Sixty-three per cent of total manufactured sales was directly exported.^{7/} The performance would have been better if it had not been for labour shortages in the labour-intensive industries such as electronics and garments.

High value added industries^{8/}

Manufacturing growth was more broadly based in recent years due to the successful promotion of industry in the higher value added sectors of the economy. Table 14 shows that commodities which made the largest contribution to manufactured value added have also higher value added/output ratios, with the exception of petroleum refineries and petroleum products, and foods, in which cases the value added/output ratios were as low as 11.0 and 16.3 per cent, respectively.^{9/} The contributions made to total value added by the nine commodities in Table 12 amounted to 76.4 per cent (compiled from Tables 13 and 14). The contribution made by the seven commodities (excluding petroleum refineries and petroleum products, and foods), which are high value added as well as high technology products, amounted to 54.5 per cent of total value added.

^{6/} See Table 11.

^{7/} This ratio does not include domestic sales.

^{8/} See Tables 12-15.

^{9/} The ratio for other commodities ranged from 30.3 to 51.3 per cent.

Table 11. Principal statistics of manufacturing
(in thousand Singapore dollars)

Year	Number of establishments	Number of workers	Materials	Output	Value added	Sales		Employees' remuneration	Capital expenditure
						Total	Direct exports		
1974	2,179	206,067	9,236,569	13,346,913	3,528,220	13,128,138	7,811,939	1,075,892	620,543
1975	2,385	191,528	8,586,011	12,610,144	3,411,129	12,401,049	7,200,693	1,180,524	622,635
1976	2,505	207,234	10,629,406	15,317,439	3,961,813	15,556,536	9,575,927	1,309,841	618,670
1977	2,638	219,112	12,224,625	17,518,249	4,475,458	17,390,502	10,969,405	1,471,749	751,622

Percentage of change 1974 over 1977

+ 5.3 + 5.7 + 15.0 + 14.4 +13.0 + 11.8 + 14.6 + 12.4 + 21.5

Source: Department of Statistics, "Report on the Census of Industrial Production 1977".

Table 12. Value added, 1977

Commodity	Value added			
	Percentage distribution ^{a/}		Value added to output ratio ^{b/}	
	Percentage	Rank ^{c/}	Percentage	Rank
Petroleum refineries and petroleum products	17.3	1	11.0	9
Radios, televisions, semi-conductors and other electrical machinery	16.9	2	30.3	7
Transport equipment and oil rigs	15.6	3	48.2	5
Calculators, refrigerators, air-conditioners and other industrial machinery	7.9	4	50.2	3
Metal grills, cans, pipes, and other fabricated products	4.5	5	35.7	6
Food	4.4	6	16.3	8
Paints, pharmaceuticals and other chemical products	3.9	7	50.0	4
Printing and publishing	3.8	8	51.3	1
Professional and scientific equipment, photographic and optical goods	2.1	9	51.0	2
Total	76.4			

Source: - Tables 13 and 14.

^{a/} Table 14.

^{b/} Table 15.

^{c/} For comparison by this table.

Table 15. Principal statistics by industry, 1977
(in thousand Singapore dollars)

Industrial code	Industry major group	Number of establishments	Number of workers	Inputs			Output value added	Sales		Employees' remuneration	Capital expenditure		
				Total	Materials	Other inputs		Work done on production	Total			Export	
311	Food	232	9,200	1,018,223	991,937	26,286	1,990	71,944	1,218,967	1,803,051	568,937	58,177	26,335
312	Beverage	14	2,506	99,070	93,786	5,285	-	38,578	168,275	69,204	167,982	31,651	21,348
313	Cigarettes and other tobacco products	9	1,225	129,357	128,517	839	11	9,716	166,385	37,018	165,310	1,602	10,541
314	Textiles and textile manufacture	70	10,537	225,879	206,516	19,364	12,065	47,133	346,040	108,896	336,972	136,250	54,699
322	Wearing apparel except footwear	300	23,276	304,347	297,804	6,543	19,059	37,381	440,233	156,827	478,972	338,239	87,011
323	Leather and leather products	34	1,223	31,204	30,176	1,028	313	3,042	44,184	12,667	43,897	26,871	5,102
324	Footwear	38	1,471	19,411	18,872	539	519	3,574	30,838	10,907	34,536	11,966	6,363
331	Sawn timber and other wood products except furniture	125	8,828	291,959	278,862	13,097	2,929	50,341	434,875	139,988	422,732	256,026	55,511
332	Furniture and fixtures except primarily of metal	70	3,433	42,804	41,448	1,356	4,132	10,235	78,065	31,128	76,710	29,638	16,761
331	Paper and paper products	80	3,604	79,902	73,137	6,764	1,562	19,919	127,291	45,827	126,353	19,024	17,558
332	Printing and publishing	235	9,208	121,452	116,792	4,660	4,928	72,154	335,326	171,946	328,224	67,721	70,120
331	Inorganic chemicals and gases	23	1,336	154,229	143,807	10,422	132	24,517	210,231	55,870	218,316	48,836	13,591
332	Plastics, pharmaceuticals and other chemical products	86	3,762	172,097	166,132	5,965	301	65,103	344,877	172,479	311,026	201,657	35,110
333	Petroleum, refineries and petroleum products	12	3,094	6,247,267	6,028,423	218,845	923	240,489	7,022,358	774,168	6,756,479	503,133	67,028
334	Leads products	6	158	19,089	18,742	347	-	780	20,965	1,876	22,194	14,107	1,096
335	Processing of jellatins and gum arabic	25	1,455	34,514	31,633	2,881	175	9,196	61,965	27,276	59,658	21,036	10,810
336	Rubber products except rubber footwear	162	6,493	141,374	131,635	9,739	3,531	31,376	219,349	74,643	219,936	52,504	31,085
337	Plastic products	11	763	22,731	16,634	6,097	336	8,393	40,001	16,934	39,885	16,495	6,761
338	Bricks, tiles and other structural clay products	12	830	7,351	1,342	6,009	150	4,374	20,449	12,948	19,695	624	5,070
341	Cement and cement additives	7	566	121,841	114,716	7,125	-	15,744	168,715	46,874	169,091	28,914	5,733
345	Structural cement and concrete products	26	1,149	40,299	38,776	1,523	300	8,360	65,314	24,715	67,216	124	8,533
349	Alumina, stone and other non-metallic mineral products	23	1,454	55,072	51,951	3,122	413	14,460	99,214	43,729	98,768	15,576	11,549
371	Iron and steel	14	1,369	75,610	58,294	17,316	1,543	16,820	142,771	65,618	139,112	21,832	13,860
372	Zinc and other non-ferrous metals	7	516	40,234	30,713	1,521	26	2,587	53,695	13,436	52,969	23,422	4,679
331	Steel mills, cast, pipes and other fabricated products	254	12,253	348,216	331,090	16,326	17,963	74,088	549,362	203,182	562,116	131,913	83,139
332	Galvanizers, refiners, other millers and industrial machinery	238	15,277	333,030	313,551	20,280	18,008	125,037	76,217	354,378	707,141	454,833	121,091
383	Radios, televisions, semi-conductors and other electrical machinery	196	52,180	1,732,347	1,694,232	38,115	13,432	139,681	2,503,076	757,228	2,480,231	2,130,009	286,868
384	Transport equipment and oil rigs	199	28,218	581,563	544,879	36,684	70,329	228,522	1,452,268	700,177	1,648,254	918,058	292,210
385	Professional and scientific equipment and photographic and optical goods	36	7,889	88,201	81,572	6,629	1,939	39,034	183,772	93,632	195,161	164,635	41,481
390	Other manufacturing industries (jewellery, toys, umbrellas, etc.)	94	5,209	142,457	139,167	3,290	6,652	20,358	202,169	53,060	195,875	83,750	24,735
	Total manufacturing	2,638	219,112	12,721,931	12,224,625	497,305	320,860	1,493,535	17,518,269	4,475,458	12,390,502	3,969,405	1,471,749

Source: Department of Statistics, "Report on the Census of Industrial Production, 1977."

Table 14. Percentage distribution of principal statistics by industry, 1977

Industrial code	Industry major group	Establishments	Sales										Employees' remuneration	Capital expenditures					
			Workers		Materials		Output		Value added		Total				Direct exports				
			%	Rank	%	Rank	%	Rank	%	Rank	%	Rank			%	Rank	%	Rank	
311	Food	8.8	5	4.2	8	8.1	3	7.0	4	4.4	6	6.9	4	5.2	4	4.0	8	3.6	7
312	Beverages	0.5	22	1.1	17	0.8	17	1.0	17	1.6	14	1.0	17	0.3	16	1.7	15	1.3	16
313	Cigarettes and other tobacco products	0.3	27	0.6	23	1.0	14	0.9	18	0.8	21	0.9	18	-	28	0.7	22	0.4	22
321	Textiles and textile manufactures	2.7	13	4.8	6	1.7	9	2.0	9	2.4	11	1.9	11	1.8	9	3.6	10	1.7	14
322	Wearing apparel except footwear	11.4	1	10.6	3	2.4	7	2.7	7	3.5	9	2.8	7	3.1	6	5.9	4	2.3	18
323	Leather and leather products	1.3	17	0.6	24	0.2	26	0.2	26	0.3	26	0.3	26	0.2	20	0.3	27	0.1	29
324	Footwear	1.4	15	0.7	18	0.2	27	0.2	26	0.2	29	0.2	26	0.1	27	0.4	25	0.2	27
331	Sawn timber and other wood products except furniture	4.7	9	4.0	9	2.3	8	2.5	8	3.1	10	2.4	8	2.3	7	3.8	9	1.1	8
332	Furniture and fixtures except primarily of metal	2.7	13	1.6	15	0.3	22	0.4	22	0.7	22	0.4	22	0.3	17	1.1	17	1.2	18
341	Paper and paper products	3.0	12	1.6	14	0.6	19	0.7	20	1.0	19	0.7	20	0.2	23	1.2	16	1.3	17
342	Printing and publishing	8.9	4	4.5	7	1.0	15	1.9	11	3.8	8	1.9	10	0.6	13	4.8	6	2.3	12
351	Industrial chemicals and masses	0.9	20	0.6	22	1.2	11	1.2	13	1.3	16	1.3	13	0.4	15	0.9	19	2.3	9
352	Paints, pharmaceutical and other chemical products	3.3	11	1.7	13	1.4	10	2.0	10	3.9	7	2.0	9	1.9	8	2.4	12	2.3	11
353	Petroleum refining and petroleum products	0.5	24	1.4	16	49.3	1	40.1	1	17.3	1	38.9	1	46.3	1	4.5	7	20.5	1
354	Processing of jellatins and gum arabic	0.2	30	0.1	30	0.1	28	0.1	29	-	30	0.1	29	0.1	26	0.1	30	0.1	30
355	Rubber products except rubber footwear	0.9	19	0.7	19	0.3	25	0.4	24	0.6	23	0.3	24	0.2	22	0.7	21	0.6	20
357	Plastic products	6.1	8	3.0	11	1.1	13	1.3	12	1.7	13	1.3	12	0.5	14	2.1	13	3.8	6
361	Pottery, china, earthenware and glass products	0.4	26	0.3	27	0.1	29	0.2	27	0.4	25	0.2	27	0.2	24	0.5	24	0.5	21
362	Bricks, tiles and other structural clay products	0.5	24	0.4	26	-	30	0.1	30	0.3	27	0.1	30	-	29	0.3	28	0.3	24
364	Cement and cement additives	0.3	28	0.2	28	0.9	16	1.0	16	1.1	18	1.0	16	0.3	18	0.4	26	0.3	25
365	Structural cement and concrete products	1.0	18	0.5	25	0.3	23	0.4	23	0.6	24	0.4	23	-	30	0.6	23	0.3	23
367	Accessories, stones and other non-metallic mineral products	0.9	20	0.7	20	0.4	21	0.6	21	1.0	20	0.6	21	0.1	25	0.8	20	0.8	19
371	Iron and steel	0.5	22	0.6	20	0.5	20	0.8	19	1.5	15	0.8	19	0.2	21	0.9	18	0.2	26
372	Zinc and other non-ferrous metals	0.3	28	0.1	30	0.3	24	0.3	25	0.3	26	0.3	25	0.3	19	0.3	29	0.1	28
361	Steel grills, cans, pipes and other fabricated products	9.6	2	5.6	5	2.7	5	3.2	6	4.5	5	3.2	6	1.2	11	5.7	5	7.4	5
382	Calculators, refrigerators, air-conditioners and industrial machinery	9.0	3	7.0	4	2.6	6	4.0	5	7.9	4	4.1	5	4.1	5	8.4	3	11.1	4
383	Radios, televisions, electronic, and other electrical machinery	7.4	7	23.8	1	13.9	2	14.3	2	16.9	2	14.3	2	19.4	2	19.5	2	16.5	2
384	Transport equipment and oil rigs	7.5	6	12.9	2	4.5	4	8.3	3	15.6	3	9.5	3	8.4	3	19.9	1	11.7	3
385	Professional and scientific equipment and photographic and optical tools	1.4	16	3.6	10	0.7	18	1.0	15	2.1	12	1.1	5	1.5	10	2.8	11	2.1	13
390	Other manufacturing industries (jewellery, toys, waxes, etc.)	3.6	10	2.4	12	1.1	12	1.2	14	1.2	17	1.1	14	0.8	12	1.7	14	1.6	15
	Total manufacturing	100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0		100.0	

Source: Department of Statistics, "Report on the Census of Industrial Production, 1977".

Table 15. Selected ratios of principal statistics by industry, 1977

Industry code	Industry major group	(in Singapore dollars)									
		Value added per worker	Output per worker	Input to output	Material to output	Value added to output	Remuneration to output	Remuneration to value added	Direct export to total sales		
311	Food	21,604	132,496	83.5	81.4	16.3	4.8	29.3	17.3		
312	Beverages	27,616	67,149	58.9	55.7	41.1	14.5	35.2	20.6		
313	Cigars and other tobacco products	30,219	135,825	77.7	77.2	22.2	6.3	28.5	1.0		
314	Textiles and textile manufactures	10,335	32,916	65.1	59.5	31.4	15.2	48.4	58.2		
321	Wearing apparel except footwear	6,738	20,632	63.4	62.0	32.7	18.1	55.5	70.6		
322	Leather and leather products	10,358	36,128	70.6	69.7	28.7	11.5	40.3	61.2		
323	Footwear	7,415	20,964	62.9	61.2	35.4	20.7	58.4	34.6		
324	Sawn timber and other wood products except furniture	15,857	49,261	67.1	64.1	32.2	12.8	39.7	60.6		
331	Furniture and fixtures except primarily of metal	9,067	22,739	54.8	53.1	39.9	21.5	53.8	39.0		
332	Paper and paper products	12,716	35,139	62.8	57.5	36.0	13.8	38.3	14.9		
341	Printing and publishing	17,331	34,189	36.2	34.8	51.3	20.9	40.8	20.0		
342	Industrial chemicals and gases	40,900	153,903	73.4	68.4	26.6	6.5	24.3	22.4		
352	Paints, pharmaceutical and other chemical products	45,484	91,674	49.9	48.2	50.0	10.2	20.4	60.0		
353	Petroleum refineries and petroleum products	250,216	2,269,670	89.0	85.8	11.0	1.0	8.7	75.2		
354	Processing of jute and ramie	11,872	132,691	91.1	89.4	8.9	5.2	58.4	64.9		
355	Rubber products except rubber footwear	18,775	42,587	55.7	51.1	44.0	17.5	39.8	35.4		
356	Plastic products	11,496	33,813	64.4	60.0	34.0	14.2	41.6	23.9		
357	Pottery, china, earthenware and glass products	22,194	52,426	56.8	41.6	42.3	16.8	39.6	41.4		
361	Bricks, tiles and other structural clay products	15,600	24,637	35.9	6.6	63.3	24.8	39.2	3.2		
362	Cement and cement additives	82,816	298,083	72.2	68.0	27.8	3.4	12.4	17.0		
363	Structural cement and concrete products	21,510	56,844	61.7	59.4	37.8	13.1	34.5	0.2		
365	Asbestos, stone and other non-metallic mineral products	30,075	68,236	55.5	52.4	44.1	11.6	26.3	15.8		
371	Iron and steel	47,931	104,289	53.0	40.8	46.0	9.7	21.1	15.7		
372	Zinc and other non-ferrous metals	26,039	104,061	74.9	72.1	25.0	8.7	34.8	33.7		
381	Metal trills, cans, pipes and other fabricated products	16,582	46,467	61.2	58.3	35.7	14.6	40.9	23.5		
382	Calculators, refrigerators, air-conditioners and industrial machinery	23,197	46,227	47.3	44.4	50.2	17.6	35.0	64.3		
383	Radios, televisions, semi-conductors and other electrical machinery	14,513	47,970	69.2	67.7	30.3	11.5	37.9	35.9		
384	Transport equipment and oil rigs	24,813	51,466	40.0	37.5	48.2	20.1	41.7	5.7		
385	Professional and scientific equipment and photographic and optical goods	11,869	23,295	48.0	44.4	51.0	22.6	44.3	31.4		
390	Other manufacturing industries (jewellery, toys, umbrellas, etc.)	10,186	38,812	70.5	68.8	26.2	12.2	46.6	12.8		
	Total manufacturing excluding rubber processing	20,425	79,951	72.6	69.8	25.5	8.4	32.9	63.1		

Source: Department of Statistics, "Report on the Census of Industrial Production, 1977".

Wages and productivity

In Singapore, a tripartite organization comprising Government, management and labour representatives called the National Wage Council sets out wage guidelines. The NWC recently announced extensive wage hikes. The measure has double objectives: (1) On the one hand, by raising the wages for the labour-intensive, low-productivity industries, such as garment manufacture and electronic components assembly, which are suffering from labour shortage, these lines will lose comparative advantage to the neighbouring countries. The Government is encouraging redeployment of these industries to the neighbouring countries where there are readily available labour forces. (2) On the other hand, Singapore has continually to develop new comparative advantages in industries which require high skill inputs and technological sophistication. To build up competitive industries, a prudent wage policy providing for realistic and orderly wage increases will be adopted with due recognition given to productivity.

If productivity growth remains at its recent rate of 6 per cent per annum (productivity growth in 1978 was only 3 per cent), total GDP would gradually be constrained to something like an 8 per cent growth. (Real growth in 1977 and 1978 was 7.8 and 8.6 per cent, respectively.) Considerable room appears to exist for accelerated growth in labour productivity, especially with the local manufacturers. In this area, Singapore is behind countries such as Hong Kong and the Republic of Korea, where productivity has grown by more than 10 per cent in some years. Singapore's wage index of 15.9, based on Japan's 100 as of March 1978 (see Table 17), shows comparative disadvantage to its export competitors: Korea (14.5 per cent) and Hong Kong (14.8 per cent).

Manufactured export^{10/}

In 1977, total direct manufactured export amounted to S \$10,969,405, or 63.1 per cent of total manufactured sales of S \$17,390,502.

The direction of exports continues to be towards developed countries. In 1977, about one-half of all domestically manufactured exports went to the markets

^{10/} See Table 18.

Table 16. Average hourly wage by industrial branch
(in Singapore cents)

	1974	1975
Foods	125	140
Beverages		
Textiles	98	109
Garments	83	102
Leather goods		
Sawn timber	125	134
Furniture		
Printing	138	147
Rubber goods	136	158
Chemicals ^{a/}		
Non-ferrous goods	149	178
Metal goods	120	135
Machinery	157	174
Electric appliances	111	127
Transport equipment	176	208
Others	98	109

Source: ILO, Yearbook of Labour Statistics, 1976.

a/ Including industrial chemicals, petrochemicals, plastics and oil refineries.

Table 17. International comparison of labour wages paid by manufacturing industries in selected Asian countries
(after adjustments of foreign exchange rates and social security - fringe benefit parities)

	Annual wage raise since 1965 (percentage)	Wage index as of March 1978
Japan	16.1	100.0
Hong Kong	9.4	14.8
Republic of Korea	23.6	14.5
Singapore	4.5	15.9
Thailand	3.0	14.7

Source: Ministry of Labour of Japan and Japan Productivity Center, as they compiled data from the ILO.

Table 16. Manufactured direct export by destination and industrial branch and its share in total sales in 1977
(in thousand Singapore dollars)

Industry	Direct export					Other countries ^{2/}	(b-3)/(a) Share (percentage)	(b-4)/(a) Share (percentage)	
	Total sales (a)	(b-1) total	(b-1)/(a) Share (percentage)	Malaysia (b-2)	(b-2)/(a) Share (percentage)				(b-3) other than Malaysia
Food	1,203,051	568,937	47.3	72,254	6.0	37,991	3.2	458,691	38.1
Beverages	167,982	34,684	20.6	1,342	0.8	14,825	8.8	18,516	11.0
Tobacco	165,310	1,602	1.0	-	0.0	1,441	0.9	161	0.1
Textiles	336,972	196,250	58.2	9,787	2.9	15,918	4.7	170,545	50.6
Wearing apparel	478,972	330,299	70.6	3,671	0.8	7,320	1.5	327,308	68.3
Leather and leather products	43,897	26,871	61.2	283	0.6	7,320	16.7	19,267	43.9
Footwear	34,596	11,966	34.7	1,841	5.3	470	1.4	9,655	28.0
Wood products	422,732	256,026	60.6	1,574	0.4	46,821	11.1	207,631	49.1
Furniture	76,710	29,898	38.9	728	0.9	3,437	4.5	25,733	33.5
Paper products	128,353	19,094	14.9	7,266	5.7	1,978	1.5	9,350	7.7
Printing and publishing	330,224	67,724	20.1	8,116	2.4	1,264	0.4	58,344	17.3
Industrial chemicals	218,316	48,836	22.3	9,248	4.2	12,640	5.8	26,949	12.3
Paints and pharmaceuticals	341,026	204,617	60.1	13,902	5.5	33,806	10.0	151,950	44.6
Petroleum refineries	6,756,479	5,081,333	75.3	315,554	4.7	937,422	13.9	3,828,357	56.7
Jelutong, gun damar	22,194	14,407	64.9	228	1.0	-	0.0	14,179	63.9
Rubber products	59,658	21,096	35.4	2,857	4.8	4,746	8.0	13,494	22.6
Plastic products	219,936	52,504	23.9	9,341	4.2	6,534	3.0	36,629	16.7
Porcelain	39,805	16,495	41.3	7,307	18.3	250	0.6	8,933	22.4
Refractories	19,695	624	3.1	66	0.3	558	2.8	-	0.0
Cement	169,691	23,914	17.0	9,113	5.4	17,402	10.2	2,399	1.4
Concrete products	67,236	124	0.2	4	0.0	66	0.1	54	0.1
Asbestos	98,788	15,276	15.7	4,523	4.6	5,743	5.8	5,280	5.3
Iron and steel	139,112	21,832	15.7	3,896	2.8	7,585	5.5	10,351	7.4
Non-ferrous metals	52,909	26,422	53.7	8,012	15.1	3,705	7.0	16,705	31.6
Metal foods	562,116	131,913	23.5	22,367	4.0	29,243	5.2	80,333	14.3
Industrial machinery	727,441	454,039	64.3	19,349	2.7	61,652	8.7	373,837	52.9
Electrical machinery	2,480,231	2,130,009	85.8	29,656	1.2	164,925	6.6	1,935,428	78.0
Transport equipment	1,648,254	918,058	55.7	8,640	0.5	61,865	3.8	847,553	51.4
Professional and scientific equipment and optical goods	195,161	164,635	84.5	1,163	0.6	1,746	1.0	161,727	82.9
Others	195,075	83,750	42.6	4,067	2.0	3,838	1.9	75,845	38.7
Total	17,290,502	10,969,405	63.1	581,185	3.3	1,492,511	8.6	8,895,709	51.2

Source: Department of Statistics, "Report on the Census of Industrial Production, 1977".

^{2/} Mainly developed countries, i.e. United States, EEC, Japan.

of developed countries. The largest single country is the United States. This pattern will be maintained and even intensified in the future, given the probable industry mix. 8.6 per cent went to Southeast Asian countries other than Malaysia, while 3.3 per cent went to Malaysia.

Goods which, in 1977, had higher rates of manufactured export-orientation (counted on the basis of direct manufactured export sales against total manufactured sales) and higher direct manufactured export sales were the following seven items listed in Table 19, which altogether accounted for 53.7 per cent of total manufactured sales, and 85.2 per cent of total manufactured export sales.

Table 19. Export orientation and direct export sales

	Export orientation (percentage)	Direct export sales (S \$000)
Electrical machinery	85.8	2,130,009
Professional and scientific equipment, optical goods	84.5	164,635
Petroleum refineries	75.3	5,081,333
Wearing apparel	70.6	338,299
Industrial machinery	64.3	454,839
Wood products	60.6	256,026
Transport equipment	55.7	<u>918,058</u>
Total		9,343,199

Of the manufactured exports to developed markets in 1977, technology - or knowledge-intensive goods - had prominent rates of export orientation: particularly professional and scientific equipment and optical goods, and electrical machinery. On the other hand, manufactured exports to developing countries had an evenly spread product mix, with a relatively higher level of export orientation among capital goods: industrial machinery and electrical machinery.

Capital investment

Of the total capital expenditures of S \$751,639,000 in 1977, S \$246,187,000 or 32.2 per cent came from local sources.

Table 20. Capital investment by country
(in thousand Singapore dollars)

<u>Major sources of capital</u>	<u>Capital expenditure</u>
Singapore	246,187
Australia	6,963
Hong Kong	39,235
Japan	106,078
Malaysia	7,755
Switzerland	20,087
United Kingdom	23,311
United States	121,978
Federal Republic of Germany	13,881
Other European countries (Netherlands, etc.)	26,261
Other	<u>139,897</u>
<u>Total^{a/}</u>	<u>751,639</u>

Source: Department of Statistics, "Report on the Census of Industrial Production, 1977".

a/ Rubber processing and granite quarrying are excluded.

Although no total figure for foreign direct investment is available, foreign investment stated in terms of gross fixed assets in industrial ventures totalled S \$3,584 million in mid-1976, a substantial increase over the end-1974 figure of S \$3,050 million. However, about 60 per cent of the new commitments were for the expansion of existing projects rather than new investments.

The mid-1976 foreign investment, as stated above, comprised different country sources as shown in Table 21 below. Foreign industrial investments, broken down by sector, are given in Table 22.

Table 21. Foreign investment by country

Country	Amount (S\$ million)	Share (percentage)
United States	1,180	32.9
United Kingdom	521	14.5
Japan	514	14.3
The Netherlands	495	13.8
Federal Republic of Germany	112	3.1
Others	762	21.4
Total	3,584	100.0

Source: Department of Statistics, "Yearbook of Statistics, Singapore".

Table 22. Foreign investment by sector
(Share in percentage)

Sector	1974	Mid-1976
Petroleum	45.0	41.2
Mechanical engineering ^{a/}	5.2	10.7
Electrical equipment and electronics	12.4	10.5
Textile and garment manufacture	7.4	6.5
Wood, cork, paper and paper products, including printing	6.3	5.4
Chemicals and chemical products, excluding plastics	4.7	5.3
Professional and scientific measuring and controlling equipment, photographic goods ^{a/}	3.7	4.1
Transport equipment	5.6	7.1
Food, beverages, tobacco	3.6	3.6
Others	6.1	5.6
Total	100.0	100.0

Source: Department of Statistics, "Yearbook of Statistics, Singapore", "Monthly Digest of Statistics".

^{a/} Recent industrial investment shows the growing success of Singapore in attracting technologically oriented industries (such as mechanical engineering; professional and scientific measuring and controlling equipment and photographic goods; transport equipment) and in promoting the use of the country as an export production base.

In 1977, 911 foreign manufacturing enterprises (either wholly or partly foreign-owned), with a total investment of about S \$4 billion, and employing 151,014 workers, which account for 68.9 per cent of the total manufacturing work force, operated in the country. There are some 12,000 foreign managers, engineers and technicians, or 20 per cent of the work force in those categories. Direct export of the 911 foreign firms amounted to S \$9,959,660,000, or 90.2 per cent of total direct manufactured export, or 57.3 per cent of total manufactured sales in the same year. It is noted that, while the direct export to total sales ratio increases with the level of foreign capital participation, the value added to output ratio declines with the level of foreign capital participation. The latter implies that foreign enterprises in Singapore are engaged more in assembly of imported components than in local production of components, as compared to local enterprises (Tables 23 and 24).

The high proportion of foreign investment reflects heavy investment in oil refining and the large number of foreign multinational firms with subsidiaries operating in Singapore.

Singapore is now the third largest oil refinery centre in the world, after Rotterdam and Houston, with a total capacity of more than one million barrels of crude oil per day.

A petrochemical complex, backed by a Japanese firm, is scheduled to begin operations by 1982. Valued at some S \$2 billion, it is by far the largest foreign project ever contemplated in the country.

The main justification for attracting foreign investment into manufacturing in Singapore has rarely been a shortage of local capital. Generally, it is because of the scarcity of marketing and technological know-how that the country actively encourages the establishment of plant facilities by wholly foreign as well as joint venture enterprises. Foreign investments are also actively encouraged to take advantage of established export markets of foreign or multinational firms. In recent years, Singapore has become increasingly attractive to export-oriented types of foreign investments, particularly multinational corporations, which find Singapore attractive as a manufacturing and distribution centre for their international operations.

Foreign industrialists appreciate the quality of Singapore's workers - their productivity, their ability to learn quickly, and their high basic educational level - which make production of the following product lines competitive at international markets:

- Manufacture of high-quality parts and components at competitive cost for supplying parent companies in home countries and subsidiaries in various parts of the world;
- Production of finished products in large volume at low cost for international markets;
- Manufacture of capital equipment, intermediate products and chemicals with cost advantage for Southeast Asia, Middle East and East African markets, especially for the off-shore oil exploration, mineral resources, agricultural and forestry development and construction projects in these areas.

Table 23. Capital structure of manufacturing industries, 1977^{a/}
(in thousand \$)

Capital structure	Number of Establishments	Number of workers	Input		Work given out	Other costs of production	Output	Value added	Sales		Employees' remuneration	Capital expenditure	
			Total	Materials					Total	Direct exports			
Wholly local	1,727	68,098	1,875,940	1,808,682	67,258	138,008	326,874	3,004,315	990,367	3,025,306	1,009,745	419,211	160,043
More than half local	309	31,509	992,230	926,481	65,749	101,224	225,688	1,661,597	568,143	1,661,597	692,496	222,705	84,825
Less than half local	254	44,972	1,689,552	1,609,153	80,399	50,551	274,860	2,433,591	693,488	2,554,552	1,780,742	298,330	91,527
Wholly foreign	348	74,533	8,164,210	7,880,310	283,999	31,076	666,114	10,418,747	2,223,461	10,137,004	7,486,422	531,503	415,244
Total		219,112	12,721,931	12,224,625	497,305	320,860	1,493,535	17,518,249	4,475,458	17,390,502	10,969,405	1,471,749	571,639

Source: Department of Statistics, "Report on the Census of Industrial Production".

a/ Rubber processing and granite quarrying are excluded.

Table 24. Selected ratios by capital structure of manufacturing industries, 1977^{a/}

Capital structure	Value added per worker (in \$ dollars)		Output per worker	Input to Output		Material to Output	Value added to output (Percentage)	Remuneration to output (Percentage)	Direct export to total sales
	Value added per worker	Output per worker		Input to Output	Material to Output				
Wholly local	14,543	44,118	62.4	60.2	33.0	14.0	42.3	33.4	
More than half local	18,031	52,734	59.7	55.8	34.2	13.4	39.2	41.4	
Less than half local	15,420	54,113	69.4	66.1	28.5	12.3	43.0	69.7	
Wholly foreign	29,832	139,787	78.4	75.6	21.3	5.1	23.9	73.9	
Total	20,425	79,951	72.6	69.8	25.5	8.4	32.9	63.1	

Source: Department of Statistics, "Report on the Census of Industrial Production".

a/ Rubber processing and granite quarrying are excluded.

Chapter III

INDUSTRIAL DEVELOPMENT CONSTRAINTS AND PERSPECTIVES

Market identification

As described in the previous chapter, the manufacturing sector of Singapore is characterized, among other things, by the predominant influence of foreign multinational enterprises, which in 1977 accounted for 57.5 per cent of capital expenditures in the country, and 90.2 per cent of the nation's direct exports. In the same year, about one-half of all domestically manufactured exports went to the markets of developed countries, as multinational firms tend to export their products produced in Singapore to parent companies in home countries. This is important as direct manufactured exports account for 63 per cent of the country's manufactured sales.

The most serious constraint to Singapore's growth may be present and future growth rates of the OECD countries and their demand for Singapore's exports. It is possible that Singapore's export demand at least partly represented a spillover of excess demand from the OECD countries, particularly Japan and the United States. At the same time, the present foreign trade regime of floating rates may have corrected earlier distortions in which Singapore benefitted from comparatively lower production costs than Japan or the United States, and may dampen the demand for Singapore's exports as well as the flow of private foreign investment.

It is widely believed in Singapore that economic fluctuations in the OECD countries are transmitted to Singapore with some time lag. The following table, prepared by the World Bank, indicates that the sharp downturn in April 1974, January 1975 and February 1975 is roughly correlated with the downturn in the OECD.

Implying this theory, the recent trend, especially after the second oil price adjustment in 1979, has not been encouraging since the indices of industrial production in the first quarters of 1976 and 1977 were 100.2 and 106.1 (1974 = 100)^{11/} respectively, while the real GDP growth rates of OECD countries

^{11/} "Asia Research Bulletin", 31 July 1978, quoting the 1977 annual report of the United States Embassy in Singapore.

Table 25. Indices of industrial production
(1970 = 100)

Year	Quarter	Singapore		OECD	
		Index	Percentage change	Index	Percentage change
1973	First	161.8	5.3	116	2.7
1973	Second	164.0	1.4	118	1.7
1973	Third	164.9	0.5	119	0.8
1973	Fourth	169.1	2.5	121	1.7
1974	First	172.0	1.7	120	- 0.8
1974	Second	174.0	1.2	120	0.0
1974	Third	175.0	0.6	119	- 0.8
1974	Fourth	166.7	- 4.9	115	- 3.4
1975	First	158.6	- 1.8	108	- 6.1
1975	Second	156.0	- 1.6	107	- 0.9
1975	Third	179.4	15.0	108	0.9

in 1976, 1977 and 1978 were 5.2, 3.7 and 3.7 per cent, respectively,^{12/} showing a similar correlation of low growth rates between Singapore and OECD.^{13/}

This calls for future attention to ways of diversifying the manufactured export markets so as to relieve Singapore from excessive dependence on the negative effects of developed countries' retarding growth.

Product identification

In promoting exports of higher-technology goods, Singapore is facing competition not only from developed countries, but also from developing countries. For example, in the case of electrical machinery and electronics, the developed markets were shared as shows in Table 26.

^{12/} July 1975 report of the OECD Secretariat.

^{13/} (a) No industrial production indices of OECD countries have been available.
(b) July 1979 report of the OECD Secretariat predicts 3.5 per cent growth of OECD countries in 1979 in real terms.

Table 26. Share of United States market in 1974,
electric and electronic machinery
(percentage)

Exporter country	
Japan	29.9
Republic of Korea	4.6
Hong Kong	6.5
Singapore	5.7
Others in Southeast Asia ^{a/}	2.0

Source: OECD, "Trade by Commodities".

a/ Thailand, the Philippines, Malaysia, Indonesia.

Table 27. Share of Japanese market in 1975,
electric and electronic machinery
(percentage)

Exporter country	
Republic of Korea	13.4
Hong Kong	0.8
Singapore	0.8
Others in Southeast Asia ^{a/}	3.0

Source: Ministry of International Trade and Industry of Japan, "White Paper on International Trade".

a/ Thailand, the Philippines, Malaysia, Indonesia.

This calls for future studies on the problem of identifying specific areas of comparative advantage for Singapore's export development.

The manufacturing sector of Singapore is characterized by the low level of local companies' participation.^{14/} In 1977, its share in total capital expenditure and total sales was 32.6 per cent and 27 per cent, respectively. In the

^{14/} Wholly local companies, and companies with more than half local capital.

same year, out of a total of 2,638 establishments, 2,036 were local companies^{15/} using 45 per cent of the labour force to produce 35 per cent of the value added, leaving 602 foreign or joint-venture companies^{16/} using 55 per cent of the labour force to produce 65 per cent of the value added. This implies that local companies are small and labour-intensive.

One of the problems that stems from the predominance of foreign or joint-venture companies as against the low profile of local companies is that the former have largely failed to live up to the country's expectations as transmitters of new technology. In Singapore, capital formation does not necessarily mean skill formation - in fact, the inflow of capital into Singapore has generated demands for low-skilled workers rather than high skills. Few foreign and joint venture companies in Singapore have their own research and development programmes to meet the local needs for high technologies. The economy depends so much on imported labour^{17/} and imported capital, that the main function of the local sector is to provide services in the manufacture of the goods for exports which are not produced by local companies.

On the other hand, the value added to output ratio of wholly local companies was as high as 33 per cent in 1977, as against 21.3 per cent for the wholly foreign companies (Table 24). This implies that the local companies have had their own skills to attain higher value added to output ratio than foreign companies, most likely in backward integration where components for assembly into the final products were manufactured by them, while foreign companies primarily concentrate on the assembly aspect only.

The high technology industries have benefits for small-scale industries held by local interests through backward linkage. For example, a foreign radio, television and telephone plant subcontracts many of the plastic components to local firms. As Singapore moves into the high-skill formation phase of its economic development, special types of skills can be singled out for fiscal and financial preferential treatment and more emphasis given to small and local companies, as these are the ones likely to place more value on the skills in any investment they make. Merger and expansion of local firms would not only achieve economies of scale in production, make possible the introduction of improved production techniques, but also increase the financial resources and credit standing

^{15/} 1,727 wholly local companies, and 309 companies with more than half local capital.

^{16/} Wholly foreign companies, and companies with less than half local capital.

^{17/} Imported from Malaysia, Indonesia, Thailand, etc.

of such firms to enable them to export, undertake research and development, and withstand setbacks in demand and supply conditions.

Local investors have shown increasing willingness to take their own capital overseas. Aside from investment in Thailand, Malaysia and Indonesia (where family ties often exist), Singapore firms have set up shop in Sri Lanka and Bangladesh. The Free-Trade Zone in Sri Lanka has already a significant concentration of Singapore inputs.

Chapter IV

THE INSTITUTIONAL INFRASTRUCTURE FOR INDUSTRIAL DEVELOPMENT

Although the country does not have a development plan, Singapore has a well-developed planning machinery. The macro-development objectives and policies are laid out by the Government on the basis of the concerted recommendations of the individual ministries. The sectoral development priorities and strategies, however, are formulated by the planning bodies within the ministries.

Various organizations have been established to undertake the specific functions of marketing, quality control and industrial research in order to assist manufacturers in their export capability.

Various efforts have been made to improve the country's industrial climate. Singapore had limited land resources; hence a rational and economic use of land was achieved through the development of industrial estates and flatland factories. The advantage of proximity to external sources of raw materials were enhanced by efficient transportation and handling facilities. Fiscal incentives were introduced to encourage both domestic and foreign investment. The structural immobility of domestic capital was gradually overcome through joint ventures with foreign capital and through Government equity participation and technical assistance. Industrial relations improved through the mutual cooperation of labour, management and Government and concentrated efforts were made to raise labour productivity. With the shortage of skilled craftsmen and technicians as the industrialization programme gained momentum, increasing emphasis was placed on industrial manpower development.

The administrative functions of industrial development in Singapore are centered around the Ministry of Trade and Industry.

The Ministry of Trade and Industry

The Ministry is responsible for economic planning, manpower planning, public sector development, regional and international economics, domestic and external trade policies, supply and control of essential commodities, shipping

and freight, tariffs, industrial policies, investment promotion, investment guarantee agreements, and statistics. Besides its direct functions enforced by different departments and divisions, the Ministry is supported by a number of agencies for specific purposes, which operate under its jurisdiction. They are the Economic Development Board, Jurong Town Corporation, National Statistical Commission, Sentona Development Corporation, Singapore Institute of Standards and Industrial Research, and Timber Industry Board, the most important ones being the following institutions:

The Economic Development Board (EDB): The EDB is primarily responsible for the formulation and implementation of the nation's industrial policies, with emphasis on creation and promotion of favourable investment climate. It consists of three Divisions - Investment Services Division, which supervises all industrial programmes;^{18/} Projects Division, which evaluates and coordinates on-going industrial projects; Manpower Development Division.

The Singapore Institute of Standards and Industrial Research (SISIR): The SISIR is essentially a multi-disciplinary industrial service organization providing industrial consultancy, contract research, standardization and technical information. It is also the national standard body in charge of quality control and a member of the International Standardization Organization.

The Jurong Town Corporation: The Corporation is described below as one of the Statutory Authorities.

The Development Bank of Singapore (DBS): The DBS provides development finance including short- and long-term lending as well as equity participation and guarantees.

International Trading Company (INTRACO): INTRACO assists manufacturers in exporting by searching for export markets, participation in international fairs and the establishment of overseas trade offices, with emphasis on centrally planned economy countries.

The National Productivity Board (NPB): The NPB boosts productivity efforts in all sectors of the economy through research projects and seminars.

The National Wages Council (NWC): The NWC is a tripartite organization comprising Government, management and labour representatives. It recommends wage increases from time to time.

^{18/} This Division maintains representatives in the United States, United Kingdom, Federal Republic of Germany, France, Switzerland, Belgium, Tokyo and Hong Kong.

Although the Government is basically committed to a free market economy, it has substantial interests in public utilities and the service sector, in building and construction, and in an increasing range of manufacturing enterprises.

There are six major Statutory Authorities in Singapore, which are as follows:

- The Monetary Authority of Singapore;
- The Telecommunications Authority;
- The Port of Singapore Authority;
- The Public Utilities Board;
- The Housing and Development Board;
- The Jurong Town Corporation (handling industrial estates' development and their management).

There are two free trade zones: one comprises the Port of Singapore Authority (a fenced-in area), and the other at Jurong port.

The Statutory Authorities account for the bulk of public sector investment. The remainder of the public sector investment is in the form of loans from the Central Bank to semi-public enterprises, the major ones being the Development Bank of Singapore, the Neptune Lines, Singapore Airlines, International Trading Company (formed to handle trade with centrally-planned economy countries), and a number of joint ventures with the industrial private sector, as follows:

- National Iron and Steel Company;
- Sembawang Shipyard;
- Jurong Shipyard;
- Bethlehem Shipyard;
- Petroleum refineries and petrochemical complexes.

The Ministry of Finance

Two Divisions of the Ministry play vital roles in implementing industrial development schemes, such as the Investment Allowance Scheme (see Chapter V). They are the Budget Division, which covers the main development estimates, and the Revenue Division, which covers Inland Revenue (taxation and revenue), Customs and Excise, Board of Commissioners of Currency, the Monetary Authority of Singapore, the Post Office Savings Bank, and the Registry of Companies.

Business associations

The following four associations play vital roles in industrial development in Singapore:

- The Industrial Training Board (see Chapter V);
- The Singapore Manufacturers' Association;
- The Singapore Employers' Federation;
- The Singapore International Chamber of Commerce.

Chapter V

INDUSTRIAL DEVELOPMENT POLICIES AND MEASURES

Singapore does not have a development plan; emphasis is placed on maintaining a maximum of planning flexibility so as to allow prompt reaction to changes in the economic situation.

The current economic strategy for the country's development over the 1970's aims at modernizing and transforming the country's economic structure from a labour-intensive into a progressively higher-technology, export-oriented industrial centre, and into a base for regional and international services. Expansion of the economic infrastructure, including human resources, and the development of more sophisticated manufacturing capacity and services are necessary.

The following are the three main aspects of industrial development which the Government is pursuing:

Development of skill-intensive industries: The present protectionist climate of the country's major trading partners in the industrialized countries, and the increasing competition among advanced developing countries at export markets (such as competition with the Republic of Korea on similar export product lines) have made it necessary for Singapore to accelerate the process of upgrading its industries in order to diversify into product lines that are less sensitive to fluctuation and competition to markets in developed countries. Examples of such product lines are products in industrial electronics and telecommunication equipment (e.g. computer components), precision engineering (e.g. watch movements, components for cameras, calculators and typewriters, professional and scientific measuring and controlling equipment, etc.) aircraft and automobile components and maintenance service, medical instruments, fine chemicals and pharmaceuticals (mainly antibiotics), downstream products of the petrochemical industry (e.g. ethylene derivatives, plastic injection moulding machines, etc.), industries supporting metal fabrication (e.g. moulds, machine tools, etc.). Upgrading of packaging and presentation of manufactured goods is also felt to be necessary.

In the next few years, an intensive drive will be made to promote such industries. A product development assistance scheme has been implemented to

encourage local manufacturing enterprises to improve their manufacturing skills and to develop new products or processes related to their existing activities.

As discussed in Chapter IV, industrial skills developed by local manufacturers are expected to help the growth of the country's manufacturing sector, rather than imported technologies which are normally contained within foreign firms without external spreading. Foreign firms also tend to require low-skilled workers rather than high-skilled. As Singapore moves into the high-skill formation phase of its economic development, the Government is aiming at developing Singapore's own industrial skills by promoting the local manufacturing enterprises and their foreign joint ventures to back-stop the backward linkage from foreign manufacturing firms, while at the same time seeking to upgrade the traditional labour-intensive foreign manufacturing firms.

While scarcity of capital sources has never existed in Singapore, the low level of locally generated investment in the manufacturing sector is one of the serious growth constraints. Local businessmen, however, have been reluctant to invest in manufacturing as they feel that they are not adequately experienced in manufacturing and are unfamiliar with world markets so that their risks are higher than those of foreign companies. In fact, the failure rate of local manufacturing enterprise with no outside capital has been 38 per cent, as against 7 per cent of United States, Japanese and Western European companies and joint ventures. Among the specific measures which the Government has recently launched to encourage local business to participate more actively in manufacturing ventures is the Capital Assistance Scheme designed to furnish both equity and/or loan capital to new and existing small- and medium-scale industries to develop skill-intensive areas or to modernize and diversify. These moves were undertaken in the belief that capital requirements and risk factors are higher with the more skill-intensive industries having higher capital/labour and capital/output ratios. Parallel to this instrument for financial aid, the Investment Allowance Scheme has been enforced to allow up to 50 per cent of approved new fixed investments to be deducted against taxable profits. While all borrowers and investors, foreign or local, are eligible, the Government hopes that the benefits of the two new Schemes will go mainly to local business establishments, which are smaller in scale, less capital-intensive and more labour-intensive, as compared to foreign firms. Also these moves are expected to help local entrepreneurs and their foreign joint ventures.

Many foreign investors enjoy Pioneer Industry status, which granted a tax holiday of five to ten years, depending on the merit of the project. About half of the 600 Pioneer certificates approved have been awarded to wholly foreign-owned companies. A breakdown of the half which went to locally-owned companies and joint ventures is not available. There are no firm criteria as to what investments are eligible for Pioneer status, but normally the amount invested has to exceed S \$1 million. Foreign investors claim, however, tax concession and Pioneer status did not play a vital role in bringing them to Singapore.^{19/} It is believed that foreign investors came to Singapore because of its strategic geographical position, highly motivated and skilled workers, and political stability. Although no basic change is expected in Singapore's policy towards foreign investment in the foreseeable future, the Government is becoming more selective in the type of industry it will actively encourage.

Firms that develop the country's technological and management skills, provide access to new export markets, upgrade labour skills, contribute to the development of local support industries or generally broaden the industrial base by forward or backward integration are especially welcome. It is hoped that, in the long run, the technological and managerial expertise Singaporeans acquire through their involvement with foreign firms will help instill a spirit of entrepreneurship. Also foreign companies that participate in ASEAN industrial complementation schemes, or that manufacture export products qualifying for preferential treatment under the recent ASEAN trade agreement are favoured.

Development of high productivity and high value added industries: Although some of the most successful industries in Singapore have been resource-based, utilizing the raw materials of the ASEAN region, there is a danger of over-dependence on such industries at a time when supplying countries seek increasingly to develop their own resource-based industries. Major industries have diversified into higher value added and more skill-intensive product lines, to optimize the use of skilled labour availability.

The National Wage Council recommended a substantial wage hike for the year beginning 1 July 1979. This clearly reflects the thrust of the Government's investment policy to promote capital- and skill-intensive industries which yield high value added and increase labour productivity, while less sophisticated and labour-intensive industries are supposed to seek investment outside Singapore.

^{19/} Tax concession is the main incentive, but not the only one. Other incentives include duty-free import of capital goods and raw materials, favourable loan conditions, equity participation, and industrial estate facilities. Foreign firms do not regard corporate income tax relief as being a particularly significant benefit since, in the initial years of operation, few firms make significant profits.

The "Economic Survey of Singapore - 1978", published by the Ministry of Finance, clearly emphasizes promotion of high value added industries in the country.

Table 28. Employment and value added in manufacturing industries

	Per cent of total employment				Per cent of total value added			
	1960	1970	1975	1978 ^{a/}	1960	1970	1975	1978 ^{a/}
Total manufacturing	100	100	100	100	100	100	100	100
Low value added industries ^{b/}	69	58	44	43	68	38	27	30
High value added industries ^{c/}	31	42	56	57	32	62	73	70

Source: Department of Statistics, "Census of Industrial Production".

^{a/} Preliminary figures.

^{b/} Low value added industries include broadly food and beverages, textiles and garments, wood and paper products, leather and rubber products, non-metallic mineral products, plastic products and "miscellaneous".

^{c/} High value added industries include broadly chemicals and chemical products, petroleum products, metals and metal products, engineering, electrical and electronic products, transport equipment and precision equipment and photographic and optical goods.

In the above table, it is noted that the weight of the ratio of the number of employees employed in low value added and high value added industries respectively reversed from 58/42 in 1970 to 44/56 in 1975, and the trend was further promoted in favour of high value added industries in 1978 to 43/57.

In Table 29 below it is noted that total manufacturing value added in 1978 was S \$5,067 million, an 11.7 per cent increase over the previous year in real terms. The largest three manufacturing sectors in terms of output and value added in 1978 are listed in Table 30. Attention should be called to the fact that the importance of the electrical and electronics output is increasing as the core of high value added industry.

Training: Singapore must ensure continued growth in the face of acute shortage of eligible labour. Growth in manufacturing is now based on a formula that seeks to encourage newer, high-technology industries while upgrading the traditional labour-intensive ones. While unskilled labour shortage is being

Table 29. Changes in output and value added of selected major manufacturing industries

Industry	1978 ^{a/}		Change over 1977			
	Output	Value added	Output		Value added	
	S\$ million	S\$ million	S\$ million	%	S\$ million	%
Total manufacturing ^{b/}	19,577	5,067	2,053	12	592	13
Metal engineering including precision equipment	1,108	536	218	24	88	20
Electrical and electronics	2,886	841	383	15	84	11
Wood products including furniture	641	223	128	25	52	30
Transport equipment and oil rigs	1,681	738	229	16	38	5
Wearing apparel	594	194	114	24	37	24
Petroleum	7,373	802	351	5	28	4
Others	5,294	1,733	637	14	265	18

Source: Department of Statistics, "Preliminary Estimates of Industrial Production, 1978".

^{a/} Preliminary figures.

^{b/} Excludes rubber processing.

Table 30. Largest three manufacturing sectors, 1978

Output	S\$ million	Value added	S\$ million
1. Petroleum	7,373	1. Electrical and electronics	841
2. Electrical and electronics	2,886	2. Petroleum	802
3. Transport equipment and oil rigs	1,681	3. Transport equipment and oil rigs	738

partly relieved by import of labourers from Malaysia, Indonesia and Thailand, Government assistance and subsidy to manpower development is felt to be the most efficient incentive to industrialists compared to fiscal and financial incentives.

The most serious manpower bottlenecks are at the professional and the skilled and technical levels. The University of Singapore, the Singapore Polytechnic, and Ngee Ann Technical College are being expanded with assistance from the IERD, UNDP and the Asian Development Bank, respectively. Many of Singapore's vocational schools are undergoing expansion. To complement formal vocational training, private employers are being encouraged to conduct accelerated in-plant training schemes. Moreover, the Government is engaged in a number of joint training schemes with several well established firms, allocating sizeable amounts in its budget. These efforts are being co-ordinated by an Industrial Training Board established in April 1973. Much expectation is attached to the recently established Vocational Training Center under the auspices of the Singapore-Japan economic co-operation programme, and to the proposed establishment of the Skill Development Fund by the National Wages Council. The programme of sending trainees abroad to parent firms is also encouraged by the Overseas Training Scheme, which receives Government subsidies.

Chapter VI

TECHNICAL ASSISTANCE

The Government does not publish formal detailed development plans because it considers that great flexibility is required in its development strategy to meet the ever-fluctuating external conditions. Consequently, it was considered that proposals for specific development activities for the immediate forthcoming years could most appropriately be reflected in the UNDP Country Programmes of relatively short duration (of three years) and consisting of clearly defined activities. The Third Country Programme of the Government of Singapore covers the three-year period 1979-1981.

UNDP assistance is being sought in the Third Country Programme, basically to support the promotion of high technologies in industries, manpower development in education and training to achieve higher skill levels, the modernization and development of infrastructure (civil aviation, telecommunication and port services), the control of pollution and the improvement of veterinary public health services, all geared to meet the challenge posed by the main development strategy to configure Singapore as a modern and competitive industrial society.

In the pursuit of the country's development efforts, the Government relies essentially on domestic and foreign investment resources. However, the contribution of external assistance to its development efforts, although relatively small in financial terms, represents a significant contribution in that it provides for some selective inputs such as specialized expertise and fellowships which the Government might find difficult to obtain otherwise. Presently, the UNDP is a major source of externally provided technical assistance.

Although industrialization has been chosen as the main development strategy for sustained economic growth with a total value of US \$1,085,000 against programmed resources of US \$5,321,000 (20 per cent), UNIDO has not been assigned to take up an executing agency's role in any of the industrial development projects contained in the Third Country Programme. UNIDO's recent assistance to the country has comprised only the Regular Programmes in the field of training which are listed on page 48.

UNDP Project No. SIN/78/013/A/01/99, entitled "Development of an Institutional Capability to Provide Supporting Technical Services to Industry", will provide essential technical services to industries in various areas; it has

<u>Project Number</u>	<u>Project Title</u>	<u>Number of fellows</u>	<u>Country to which trainee was sent</u>	<u>Project duration</u>
RP/SIN/79/001	Marketing management	1	United States	14 June-29 July 1979
RP/SIN/79/002	Training of training manager	1	Austria	6 August-7 September 1979

been decided among the authorities concerned that this project will be executed by the Government, which will be represented for the purpose of such execution by the Singapore Institute of Standards and Industrial Research. UNIDO had been duly consulted before such a decision was taken.

Chapter VII

POSSIBLE AREAS OF FUTURE UNIDO CO-OPERATION

While there are no IPF or SIS projects from UNIDO currently in progress in Singapore, the Senior Industrial Development Field Adviser, UNIDO, has prepared a draft programming perspective on Singapore^{20/} in order to guide UNIDO in planning an appropriate co-operation programme for the period 1981-1982 onwards, as the Third Country Programme Cycle draws near. This draft is presently being reviewed by the Singapore authorities concerned before it will be finalized.

According to this draft, the following areas may be indicated for UNIDO's consideration in its co-operation with Singapore:

- To support Singapore's programme in identifying resources for TCDC activities for the Southeast Asia region;
- To support Singapore's programme to move the industrialization into technology-intensive areas, possibly by contributing to its technical manpower training and development;
- To support Singapore's programmes for the development of local enterprises; experts and advisory assistance especially in technology and managerial services may be appropriate;
- To support Singapore's programme in small-scale industry development and extension services.

The above programming perspectives were discussed for finalizing the above-mentioned draft between the UNIDO SIDFA mission^{21/} and the Singapore authorities concerned, which visited Singapore on 25 and 27 October 1979. Besides this Report, the Mission followed up the following activities which were previously under correspondence:

- Exploration of a new proposal for training in pharmaceutical manufacturing;
- Contribution to the Industrial Development Fund;
- A survey to assess potential and existing possibilities of exporting technology in various forms from selected developing countries to the other developing countries;

^{20/} Reference PRO 300/ID-SING, dated 15 October 1979.

^{21/} Reference SING/MS/SIDFA/79/2, dated 9 November 1979, "Mission Report to Singapore".

- Ship/boat-building, ship repair and port development;
- Co-operation with the trade unions;
- Assistance to sick companies.

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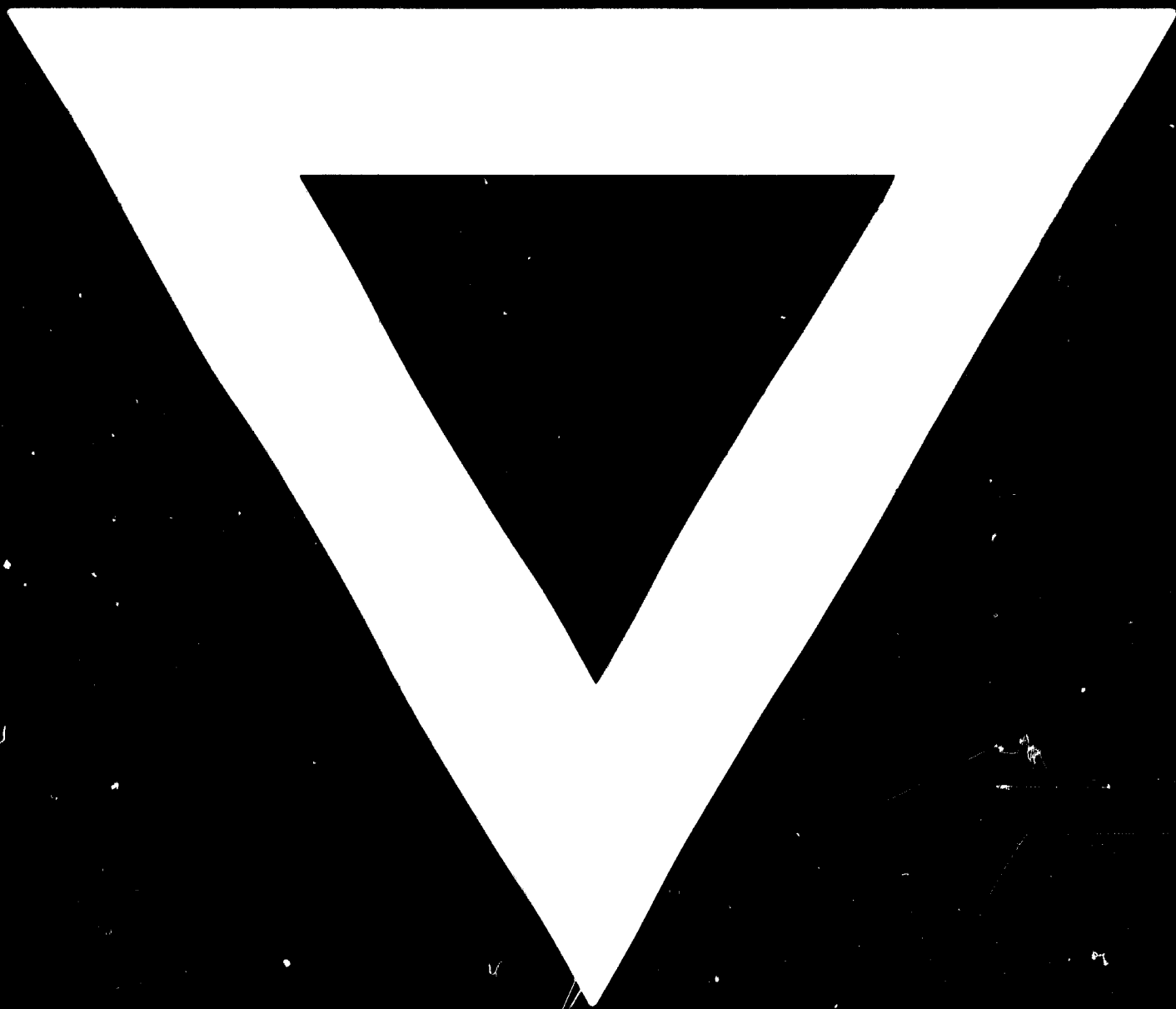
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