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INDUSTRIAL DEVELOPMENT REVIEW SERIES

VIET NAM

Industrial policy reform and international co-operation

V.91-20427

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PREFACE

This Industrial Development Review is one of a series of country studies prepared by the Regional and Country Studies Branch of the United Nations Industrial Development Organization (UNIDO).

The Reviews present brief factual and analytical surveys of industrial development in developing countries. Such industry-specific Reviews are in demand for a variety of purposes: to provide an information service to relevant sections within UNIDO and other international organizations and aid agencies concerned with technical assistance to industry; to be used as a reference source for financial organizations, public and private industrial enterprises, and economic research institutes in developed and developing countries; and to serve as a handy, useful information source for policy-makers in developing countries. The Reviews do not represent in-depth industrial surveys. With an exclusive focus on industry they present information and analyses on the broad spectrum of the industrial development process in the countries concerned in a condensed form.

The Reviews draw primarily on information and material available at UNIDO headquarters from national and international sources as well as data contained in the UNIDO data base. Generally, the presentation of up-to-date information on subsectoral manufacturing trends is constrained by incomplete national data on the industrial sector. To supplement efforts under way in UNIDO to improve the data base and to monitor industrial progress and changes on a regular basis, it is hoped that the relevant national authorities and institutions and other readers will provide comments and further information. Such response will greatly assist in updating the Reviews.

This Review was prepared with the assistance of Sarwar Hobohm, UNIDO consultant, on the basis of information available at end October 1990. The Review is divided into four Chapters. Chapter I assesses the structure and recent development trends of the Vietnamese economy. The macroeconomic and industrial policy environment is analyzed in Chapter II. The following Chapter provides an overview of the manufacturing sector in Viet Nam, and discusses such issues as the scale, location and ownership of industrial production facilities in Viet Nam. The final Chapter IV examines individual industrial branches and attempts to evaluate their prospects in the light of available resources, recent development in the industries concerned, and the principal constraints facing these industries.

Annexed to this report are the Statistical Tables (Annex A) and information related to the investment environment (Annex B) including the text of the foreign investment law of 1987. Annex B is accompanied by two further small annexes comparing Viet Nam's features as a favourable investment site with those of the country's competitors for investment funds. In addition, this Annex also contains a listing of potential foreign investment projects drawn up by the Vietnamese trade authorities, as well as a listing of technical assistance projects in which UNIDO plays a major role.

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Regional classifications, trade classifications, and symbols used in the statistical tables of this report, unless otherwise indicated, follow those adopted in the *United Nations Statistical Yearbook*.

Dates divided by a slash (1988/89) indicate a fiscal year or a crop year. Dates divided by a hyphen (1988-1989) indicates the full period, including the beginning and the end years.

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

Percentage may not add due to rounding.

In Tables:

- Three dots (...) indicate that data are not available or separately reported;
- A hyphen (-) indicates that the item is not applicable or the amount is negligible.

The following abbreviations are used in this document:

BAD	Bank for Agricultural Development
BCI	Bank for Commerce and Industry
BFT	Bank of Foreign Trade
BIC	Bank for Investment and Construction
BIT	Bank for Industry and Trade
CCS	Commercial cane sugar
CMEA	Council for Mutual Economic Assistance
CTC	Cutting-threshing-curling
EIB	Export-Import Bank
EPZs	Export Processing Zones
FACR	Foreign Assets Control Regulations
FAO	Food and Agricultural Organization of the United Nations
GDP	Gross domestic product
GNP	Gross national product
IBEC	International Bank for Economic Co-operation
IEEPA	International Emergency Economic Powers Act
ILO	International Labour Organization
IMF	International Monetary Fund
MAFI	Ministry of Agriculture and Food Industry
MVA	Manufacturing value added
NEZs	New Economic Zones
OECD	Organization for Economic Co-operation and Development
SBV	State Bank of Viet Nam
SCCI	State Committee for Co-operation and Investment
SIDA	Swedish International Development Authority
SMIs	Small-/medium-scale industries
SPC	State Planning Committee
TWEA	Trading with the Enemy Act
UNDP	United Nations Development Programme
UNSNA	United Nations System of National Accounts
WIPO	World Intellectual Property Organization

BASIC INDICATORS 1
Macroeconomic indicators

Population (1989) : 64.4 million

Employed labour force (1989) : 28.8 million

Gross domestic product (1989) (constant 1982 prices) : 222.2 billion dong

Nominal GDP per capita (1989) : 310,422 dong

Nominal GDP per capita (1989) : $73.9 official rate

Nominal GDP per capita (1989) : $73.9 market rate (estimate)

Growth of GDP (percentage) (based on constant 1982 prices) :

1984	1985	1986	1987	1988	1989
8.4	5.6	3.4	2.5	5.8	2.4

Distribution of gross material product (percentage) (84.7 per cent of GDP 1983-1989)

	1983	1989
Agriculture	45.0	41.1
Industry	21.8	24.3
Commerce	11.9	12.2
Transport and communication	1.5	1.5
Construction	2.4	2.2
Other	2.2	3.4

International trade (1989)

a) Convertible area
- Exports : $976 million
- Imports : $645 million
- Trade balance : $331 million
- Current account balance : -$196 million

b) Non-convertible area
- Exports : 844 million of transferable rubles
- Imports : 1,798 million of transferable rubles
- Trade balance : -954 million of transferable rubles
- Current account balance : -1,335 million of transferable rubles

External debt total (1988) : $9,703 million
of which
- non-convertible currencies : $6,484 million
- convertible currencies : $3,219 million

Debt service (1988)
(As percentage of merchandise exports)
a) Non-convertible area
- Scheduled : 81.2 per cent
- Actual : 63.8 per cent

b) Convertible area
- Scheduled : 390 per cent
- Actual : 31 per cent

General price index
Annual percentage change :

1983	1984	1985	1986	1987	1988	1989
49.5	64.9	91.6	487.2	301.3	308.2	76.0

Exchange rate
Annual average, dong per $:

	1983	1984	1985	1986	1987	1988	1989
Official rate	10.4	11.2	100.0	14.0	80.0	270.0	4,200
Market rate (estimate)	150	150	350	250	1,000	4,500	4,200

BASIC INDICATORS II
Key industrial indicators[a/]

Gross material product in industry (1989) (constant 1982 prices)	:	54.0 billion dong						
Industrial employment	:	1984			1989			
		2,685,000			3,367,000			
Growth of gross material product in industry (percentage)	:	1983	1984	1985	1986	1987	1988	1989
		6.7	12.0	12.4	4.5	11.3	3.9	-3.6
Composition of gross industrial production (percentage)	:	1983			1989			
By sector								
Heavy industry		34.1			28.9			
Light industry		65.9			71.1			
By type of management								
Central government		35.1			33.0			
Local government		64.9			67.0			
By industry								
Food and foodstuffs		26.9			28.2			
Construction materials, earthenware, porcelain, glassware, wood, forest products, cellulose, poster and paper industries		21.6			16.8			
Weaving, leather, sewing, dyeing, printing and other cultural products		16.9			17.7			
Machinery and engineering		13.3			15.8			
Chemical industry		9.6			9.9			
Energy, combustibles		6.5			5.7			
Metallurgy		1.4			1.6			
Other industries		3.5			4.3			
Composition of exports (percentage)		1983			1987			
Coal		4.8			1.4			
Rubber		5.1			3.2			
Tea		2.3			1.8			
Coffee		0.9			3.2			
Wood flooring		1.7			2.2			
Marine products		10.2			12.8			
Agricultural/forestry products		25.7			33.9			
Handicrafts and light industry		49.3			27.4			
Petroleum		...			3.4			
Unclassified		...			10.8			
Destination of exports (percentage)								
Convertible area		38.1			48.9			
Non-convertible area		61.9			51.1			
Composition of imports (percentage)								
Consumer goods		11.1			14.3			
Capital and intermediate goods		88.9			85.7			
Origin of imports (percentage of total)								
Convertible area		25			21			
Non-convertible area		75			79			

a/ Vietnamese national accounts data present only aggregate figures for the industrial sector as a whole, and do not distinguish between various industrial subsectors. The industrial sector in this context is defined to include manufacturing, mining and the production of electricity, but excludes construction and the provision of other public utilities such as gas and water. No accurate assessment is therefore possible of the contribution of manufacturing industry alone to the Vietnamese economy. This is widely acknowledged to be the most important component of the industrial sector, however, even though mining plays a significant role in northern Viet Nam and the importance of electricity production is increasing as a result of several new power generation projects coming on stream.

BASIC INDICATORS III

Comparison of selected indicators

Indicator	Unit	Viet Nam	Territory of Hong Kong	Republic of Korea	Indonesia	Malaysia	Thailand
Population (mid-1988)	million	64.2	5.7	42	174.8	16.9	54.5
Population growth (1980-1988)	per cent	2.4	1.5	1.2	2.1	2.6	1.9
Area	'000 sq km	330	1	99	1,905	330	513
GDP (1988)	$ million	43,519c/ (official rate) 2,611c/ (market rate)	44,830	171,310	83,220	5,490	57,950
Average annual growth of GDP (1980-1988)	per cent	4.7d/	7.3	9.9	5.1	4.6	6.0
GNP per capita (1988)	$	685c/ (official rate) 40c/ (market rate)	9,220	3,600	440	1,940	1,000
Average annual growth rate of per capita (1965-1988)	per cent	...	6.3	6.8	4.3	4.0	4.0
Agriculture (1988)	per cent of GDP	39e/	0	11	24	21.1	7
Industry (1988)	per cent of GDP	26e/	29	43	36	34.6	35
Manufacturing (1988)	per cent of GDP	...	22	32	19	24.3	24
Services (1988)	per cent of GDP	20e/	70	46	40	44.3	48
Gross domestic investment (1988)	per cent of GDP	...	28	30	22	26	28
Exports of goods and non-factor services (1988)	per cent of GDP	...	136	41	25	67	34
Current account balance (1988)a/	$ million	-1,086	1,199	14,161	1,189	1,802	-1,671
External public debt (1988)	$ million	9,703	...	21,349	41,258	16,101	13,375
Debt service (1988)	per cent of exports of goods and services	64f/ 31g/	...	9.1	34.1	10	11.3
Official development assistanceb/ (1988)	$ million	148	22	10	1,632	104	563
Average annual rate of inflation (1980-1988)	per cent	183.4h/	6.3	6.8	4.3	4.0	3.1

Source (see following page)

Source: World Bank, *World Development Report 1990* (Washington D.C. 1990); UNIDO data base.

a/ After official transfers.
b/ Net disbursement of ODA from all sources.
c/ Exchange rate 1988 (annual average, dong per US$)
official rate 270.0
market rate 4,500.-.
d/ 1983-1989.
e/ Percentage of gross material product (84.7 per cent of GDP).
f/ Non-convertible area (actual).
g/ Convertible area (actual).
h/ Retail price index, 1981-1988.

SUMMARY

Viet Nam's economic development has been severely constrained by the five decades of almost continuous conflict, politic upheaval, and relatively high degree of international isolation it has had to endure during this period. While many of its neighbouring countries in east and south-east Asia have made considerable strides towards industrializing their economies, Viet Nam remains an essentially subsistence oriented agricultural economy with a comparatively unsophisticated industrial sector based primarily on the processing of agricultural commodities. While the largely ideologically based preference of the Government of Viet Nam for heavy industry has resulted in the establishment of a number of metallurgical, engineering and chemical industries, these remain to a considerable extent embryonic. Apart from the agricultural processing industries, only such relatively light manufacturing industries as the textile and clothing, basic building materials and general household goods industries have so far developed to a reasonably advanced stage in Viet Nam.

One of the most critical causes for Viet Nam's modest developmental performance in the years since the ending of the Viet Nam war in 1975 and the subsequent establishment of a unified State governed by the Vietnamese Communist Party has been a severe shortage of capital. Early hopes that the ending of the war would unlock large-scale financial assistance from the United States of America and other bilateral and multilateral donors were disappointed as successive United States governments imposed extensive trade and investment sanctions against the country, which indirectly also inhibited inflows of aid funds from a number of other important sources. The situation was exacerbated in 1985, when Viet Nam was forced to default on payments on an IMF facility, and hence became ineligible for further IMF funds. Despite a subsequent improvement in the country's repayment record, IMF (and indeed World Bank) funding has not been restored, principally because of persistent United States pressure.

As a result of the continued strains between Viet Nam and the major western States and institutions, the country became increasingly dependent on its economic links with the CMEA in general, and the Soviet Union and eastern Europe in particular. These countries came to supply the bulk of Viet Nam's intermediate and capital goods, and became the main markets for Viet Nam's exports. In addition, they also absorbed substantial volumes of Viet Nam's surplus labour, which not only served to ease social and economic tensions within Viet Nam but also helped to boost the country's foreign exchange earnings through the remittances of these "guest workers".

Frequent vacillations of economic policy have also played a major contributory role in retarding Viet Nam's economic development during the past 15 years. Throughout this period, the Government of Viet Nam has followed a centrally planned path towards the structural transformation of the country's economy, with considerable stress being placed on the achievement of this goal through the socialization and co-operativization of the means of production. Public resistance against such measures usually prevented these policies from being pursued for any length of time, however, and often forced the government to intersperse these from time to time with more liberal policies.

As a corollary of its centrally planned approach to economic management, the government also tended to assign a high degree of priority to the achievement of physical production targets, even at the expense of macroeconomic and financial stability. The inevitable deterioration in Viet Nam's economic performance resulting from this unbalanced policy, which manifested itself in high budgetary deficits, rapid monetary growth, and soaring inflation also forced the Government of Viet Nam to intersperse periods of doctrinaire policies with periods of more liberal policies to enable the achievement of an economic recovery. This cycle of reform and repression reached its latest stage in 1987-88 with the adoption of a policy of economic restructuring analogous to *perestroika* in the USSR, known locally as *doi moi*. Under the banner of this programme, the pragmatic leadership currently in office in Viet Nam introduced a number of measures to reduce the country's dependence on the CMEA, improve its macroeconomic management, and in particular to attract western investment flows. By the end of 1989 these measures appeared to be having a considerable degree of success, with financial control having been re-established and inflationary pressures having been dampened, domestic economic growth having received a boost, the external trade performance having been improved, and substantial volumes of foreign investment funds having been committed.

The increasingly favourable outlook for Viet Nam, following the introduction of the *doi moi* reforms suffered a major external shock in 1990 as a result of the profound changes taking place in the USSR and eastern Europe, Viet Nam's principal trading partners and aid donors. These changes have resulted in a dramatic disruption of Viet Nam's trading patterns, with the supply of major raw materials and intermediate goods drying up and demand for Vietnamese exports from these countries being substantially reduced. The effects of these developments are exacerbated further by growing pressure for an accelerated repatriation of Vietnamese "guest workers" from several European countries, which will reduce the inflow of remittances and put increasing pressure on the Government of Viet Nam to create more jobs. The situation is likely to become even more difficult in 1991, when intra-CMEA trade is scheduled to be based on market-related prices and conducted in hard currencies.

Faced with this deteriorating external environment, the Government of Viet Nam has adopted a number of forceful measures to ensure that the damage inflicted by these developments on the Vietnamese economy is contained. At one level, it has taken active steps to diversify both its export products and export markets in order to minimize the damaging effects of the effective collapse of the CMEA, and has supported this export promotion drive with two devaluations of the dong in 1989 and 1990. At another level it has sought to restrain the outflow of scarce foreign exchange and gold resources by strengthening its stance against smuggling. Finally, it has taken active steps to attract western direct investment in order to assist in the country's development and acquire the foreign exchange it will soon be needing to pay for its essential imports. The foreign investment law of 1987 was widely celebrated - at the time of its promulgation - as the most liberal of its kind in any socialist country and the release of which marked a major milestone in Viet Nam attempts to reintegrate itself into the world economy. However, this policy environment for foreign investment may be modified if the "Draft Platform for the Building of Socialism in the Transition Period" and "Draft Strategy for Socio-Economic Stabilization and Development up to the Year 2000" released by the Vietnamese Communist Party on 1 December 1990 will be approved at the 7th Party Congress in May 1991.

I. THE ECONOMY OF VIET NAM

A. RECENT ECONOMIC TRENDS

Viet Nam's economic development has been severely hampered by its turbulent political history. During the past half century the country has suffered almost uninterrupted military conflict, more than twenty years of partition into two distinct political entities based on contrasting economic systems, and a decade of policy struggle between reformers and conservatives following the formal reunification of the country in June 1976. The impact of these developments has been reinforced further by continued strains in Viet Nam's external relations with a number of foreign countries, which have inhibited the expansion of normal trade and capital flows and restrained the country's reintegration into the world economy.

At the end of the Viet Nam war in 1975, the two parts of the country faced widespread war damage and poverty. The northern part of the country, under communist control since 1945, had adopted a socialist system of collective ownership and centralized economic planning, with some devolution of powers to local (provincial and district) governments as a wartime expediency. The southern part, meanwhile, had adopted an essentially market-oriented system and developed a strongly commercialized free enterprise economy.

In the immediate aftermath of the socialist victory the new leadership was concerned to avoid exacerbating the serious economic and social disruption from which the vanquished south was suffering, and in particular to prevent a collapse in confidence and production. While retaining the extension of the northern economic system to the south as a longer term objective, it therefore accepted the need to pursue moderate and pragmatic policies in the short term. The ensuing contradictions proved increasingly difficult to reconcile, and resulted in more than a decade of vacillating economic management during which periods of doctrinaire economic policies alternated with periods of economic liberalization.

The launch in 1976 of the First National Plan, which had been timed to coincide with the five-year planning cycle of the Soviet Union and Eastern Europe, reinforced the pressures for an early integration of the southern economy into socialist framework of the north. During the following two years the socialization of the south consequently gathered momentum, with agriculture being co-operativized or collectivized, medium- and large-scale industrial establishments being nationalized, and all private trade being prohibited. The merger of the two economies was completed in May 1978 through a currency union.

A sharp reduction in rice and livestock production in southern Viet Nam in response to the accelerated collectivization of southern agriculture during the late 1970s prompted a brief flurry of economic liberalization in 1979. This involved the introduction of a number of measures aimed at softening the impact of agricultural collectivization, reforming the administrative procedures employed by State-owned firms, promoting the informal private sector, and liberalizing the external trade regime. Hardening resistance by traditional leaders and bureaucratic interests in the following years prevented the further pursuit of reformist policies, however, and even inhibited the full implementation of the 1979 measures.

As increased emphasis began to be placed on the implementation of a rigid centrally planned economic system, with priority being given to the achievement of physical output targets and macroeconomic policy instruments being used principally to accommodate this objective rather than to maintain economic stability, inflationary pressures began to mount. As shown in Table I.1 and Annex Table A-1, the subsequent emergence of rampant inflation was accompanied by a sharp slow-down in economic growth, particularly in the pre-eminent agricultural sector. This was caused partly by unfavourable weather conditions, but was primarily the result of producer response to government policies.

In September 1985 the government felt strong enough to promulgate a further set of economic reforms aimed primarily at the adoption of more appropriate macroeconomic policies to curb inflation. The measures adopted included a rationalization of the government's price and wage policies in order to restrain the rapidly widening budget deficits which had been generated by the previously widespread granting of subsidies, as well as a tightening of domestic liquidity to restore a degree of monetary balance.

Table 1.1. Estimated gross domestic product, 1983-1989[a/]
(Constant 1982 prices)

	1983	1984	1985	1986	1987	1988	1989
Billion dong							
Gross domestic product[b/]	169.1	183.3	193.6	200.1	205.2	217.0	222.2
of which:							
Gross material product[b/]	143.4	155.3	164.1	169.6	173.9	183.9	188.3
of which:							
Agriculture	76.1	79.8	83.4	84.6	81.7	84.5	91.3
Industry	36.8	41.2	46.3	48.4	53.9	56.0	54.0
Commerce	20.1	23.4	22.1	23.4	24.3	25.8	27.2
Transport and communications	2.6	2.5	2.8	3.0	3.5	3.5	3.4
Construction	4.1	4.6	5.0	5.0	5.3	5.1	4.9
Other	3.7	3.8	4.5	5.2	5.2	8.9	7.5
Other[b/]	25.8	28.0	29.5	30.5	31.3	33.1	33.9
of which:							
Non-material services	18.6	20.2	21.3	22.0	22.6	23.9	24.4
Depreciation	7.2	7.8	8.2	8.5	8.7	9.2	9.5
GDP deflator[c/d/]	150.0	247.0	472.0	277.3	1,112.9	5,414.7	8,998.3
Nominal GDP	253.7	452.0	913.8	554.9	2,283.7	11,750.0	19,994.3
Nominal GDP/caput (dong)[d/]	4,420	7,705	15,265	9,080	36,570	184,370	310,422
Nominal GDP/caput ($, off rate)	425	690	-	650	465	685	73.9
Nominal GDP/caput ($, mkt rate)	30	50	45	35	35	40	73.9
Memorandum items:							
Population (million)	57.37	58.65	59.87	61.11	62.45	63.81	64.41
Exchange rate (annual average, dong/$)[d/]							
Official rate	10.4	11.2	100.0	14.0	80.0	270.0	4,200
Market rate (estimate)	150	150	350	250	1,000	4,500	4,200
Percentage of GDP							
Gross domestic product[b/]	100.0	100.0	100.0	100.0	100.0	100.0	100.0
of which:							
Gross material product[b/]	84.8	84.7	84.7	84.8	84.7	84.7	84.7
of which:							
Agriculture	45.0	43.5	43.1	42.3	39.8	38.9	41.1
Industry	21.8	22.5	23.9	24.2	26.3	25.8	24.3
Commerce	11.9	12.8	11.4	11.7	11.8	11.9	12.2
Transport and communications	1.5	1.4	1.4	1.5	1.7	1.6	1.5
Construction	2.4	2.5	2.6	2.5	2.6	2.4	2.2
Other	2.2	2.1	2.3	2.6	2.5	4.1	3.4
Other[b/]	15.3	15.3	15.3	15.2	15.3	15.3	15.3
of which:							
Non-material services	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Depreciation	4.3	4.3	4.3	4.2	4.3	4.3	4.3
Percentage change from previous year							
Gross domestic product[b/]	...	8.4	5.6	3.4	2.5	5.8	2.4
of which:							
Gross material product[b/]	7.2	8.3	5.7	3.4	2.5	5.8	2.4
of which:							
Agriculture	7.2	4.9	4.7	1.9	-3.4	3.4	8.0
Industry	6.7	12.0	12.4	4.5	11.3	3.9	-3.6
Commerce	...	16.4	-5.6	5.9	3.8	6.2	5.4
Transport and communications	...	-3.8	12.0	7.1	16.7	0.0	-2.9
Construction	...	12.2	8.7	0.0	6.0	-3.8	-3.9
Other	...	2.7	18.4	15.6	0.0	71.2	-11.8
Other[b/]	...	8.5	5.4	3.4	2.6	5.8	-15.7
of which:							
Non-material services	...	8.6	5.4	3.3	2.7	5.8	2.1
Depreciation	...	8.3	5.1	3.7	2.4	5.7	3.3

Source (see following page)

Sources: Real GDP: Official data provided by Vietnamese authorities, as adjusted by and cited in International Monetary Fund, *Viet Nam - Recent Economic Developments*, Memo from the Secretary to members of the Executive Board dated May 11, 1988, page 7 (data for 1983), Socialist Republic of Viet Nam, State Planning Committee and United Nations Development Programme, *Report on the Economy of Viet Nam*, January 1990, page 31 (data for 1984-1988) and author (data for 1989). GDP deflator and nominal GDP: Christopher F. Bruton and Mathilde L. Genovese, Vietnam: An Investor's Appraisal, *Business International Asia-Pacific*, Hong Kong, June 1990, page 35 (data for 1983-1987) and author (data for 1988-89). Exchange rates: *The Economist Intelligence Unit*, Indochina: Vietnam, Laos, Cambodia - Country Profile 1989-90, EIU, London, 1989, page 13.

a/ Totals may not add due to rounding.

b/ In common with most socialist countries, Viet Nam employs the material product system of national income accounting. This fails to take into account the impact of non-material services and depreciation, and provides only partial coverage even of material production by excluding a significant proportion of private sector activity and own-account production by public sector enterprises. It therefore inevitably results in a serious underestimation of national income, which the above Table attempts to compensate for by including estimated values for some of the principal variables neglected in the official Vietnamese data.

c/ 1982 = 100.

d/ Adjusted for introduction of "new dong" in September 1985, which replaced the old dong at a rate of one to ten up to a certain limit, with additional private holdings of old dong having to be deposited at the State Bank of Viet Nam to mop up excess liquidity.

The implementation of these measures left much to be desired, however, as persistent and widening gaps between administered and free market prices continued to necessitate increasing volumes of budgetary subsidies, and as the threat to the achievement of the State sector's output targets caused by liquidity shortages forced the government to reverse its tight monetary stance. The result was an unprecedented upsurge in inflation, which averaged almost 490 per cent in 1986 and according to one source peaked at some 700 per cent in the twelve months to September of that year.[1/] In 1987 it abated slightly, but in the following year it picked up again following another round of compensating adjustments in the official price structure to bridge the gap between official and free market prices, which by this time had again become untenable.

This continued economic instability during the early and mid 1980s was matched by a persistent deterioration in the Vietnamese economy's growth performance. As indicated in Table I.1, the country's overall GDP growth rate declined steadily in real terms between 1984 and 1987 to the extent that one recent report has suggested an actual contraction in real *per capita* output during this period.[2/] This decline was caused largely by a continued weakening of agricultural output growth owing both to unfavourable climatic conditions and policy measures, which resulted in *per capita* paddy production falling from 247 kg to 239 kg in northern Viet Nam and from 364 kg to 325 kg in southern Viet Nam between 1985 and 1987.

The mounting imbalances in the domestic economy and the maintenance of an overvalued exchange rate for the Vietnamese dong prompted a progressive worsening of Viet Nam's balance of payments during the mid-1980s. As shown in Annex Tables A-2 and A-3, this deterioration of Viet Nam's external payments position assumed crisis proportions by 1988, when the country recorded heavy current account deficits both with countries of the Council for Mutual Economic Assistance (CMEA) and the convertible currency trading areas. Export earnings were sufficient only to pay about one third of import costs in the non-convertible area, while gross official reserves covered less than one week of imports from the convertible area. The burden of Viet Nam's external debt, which is summarized in Table I.2, had also become increasingly difficult to bear, with the total outstanding debt amounting to twelve times the level of annual export revenues and the debt service ratio amounting to no less than 160 per cent.

Faced with economic problems on such a scale, the Government of Viet Nam conducted a thorough reappraisal of its economic policy in 1987/88. The period since December 1986 has consequently witnessed the implementation of a programme of State sponsored renewal analogous to the process of *perestroika* in the USSR. This programme, known by its Vietnamese name as *doi moi*, has prompted an accelerating transition away from the traditional economic management involving central planning and bureaucratic regulation, which had been applied so rigidly in the preceding years. After a number of preparatory moves

in 1987 the government began to introduce a steady and still continuing stream of liberalizing economic reforms in 1988.

Table I.2. External debt, 1983-1988[a/]
($ million, end of period)

	1983	1984	1985	1986	1987	1988
Total debt	5,074	7,479	10,423	9,481	9,235	9,703
of which:						
Non-convertible currencies	3,413	5,864	8,509	7,215	6,309	6,484
Convertible currencies	1,661	1,615	1,914	2,266	2,926	3,219
of which:						
International organizations	136	180	198	237	307	314
Official creditors	1,088	992	1,116	1,227	1,497	1,454
Private creditors	343	350	452	543	609	834
Short term credits	59	93	148	259	513	615
Arrears	436	650	694	986	1,489	1,978

Sources: Official data provided by Vietnamese authorities, as cited in International Monetary Fund, *Viet Nam - Recent Economic Developments*, Memo from the Secretary to members of the Executive Board dated May 11, 1988, page 77 (data for 1983), and Socialist Republic of Viet Nam, State Planning Committee and United Nations Development Programme, *Report on the Economy of Viet Nam*, January 1990, page 63 (data for 1984-1988).

a/ Totals may not add due to rounding.

On January 8 of that year the Council of Ministers promulgated a new foreign investment law, which had been adopted by the National Assembly on December 29, 1987, and was the most liberal of its kind in any socialist country at the time. This was followed in March 1988 by the government's acknowledgement of private rights to property and its decision to legitimize individual and family-based commercial activities. The State-owned industrial sector has also been subject to extensive deregulation since 1988, and efforts have been made to improve the provision of ancillary services and facilities.

In addition to these policies aimed at improving the microeconomic operating environment of the business sector, the Government of Viet Nam has also sought to establish a macroeconomic policy framework conducive to the development of a more market-oriented economy during the past few years. A particular effort has been made to curb inflationary pressures, both through a reduction of the government's traditionally large budget deficits and through the imposition of a more restrictive monetary policy. These measures have had a considerable success, and by mid-1989 inflation had been brought under control.

In conjunction with these forceful efforts to restore fiscal and monetary balance to the Vietnamese economy, the government committed itself to the introduction of a more market-oriented pricing structure. To this end, a deliberate policy to decontrol prices was introduced in early 1989, and by the end of that year only the prices of electricity, petroleum and freight transport were still subject to central control. At the same time the government also initiated a sharp devaluation of the dong, with the official exchange rate being brought broadly into line with the free market rate and the abandonment of the previously prevailing multiple exchange rate system, at least in relation with the convertible area. These two measures had a dramatic impact on the Vietnamese economy, with the former calling forth increased output levels and a greater variety of consumer choice, and the latter prompting a substantial growth in Viet Nam's economic relations with the outside world.

The potential benefits of these measures have been seriously eroded by the economic and political changes that have taken place since the end of 1989 in the USSR and the countries of eastern Europe, on which Viet Nam has traditionally depended heavily for economic assistance and subsidized trade. The effective breakdown of these long established financial and trading relationships during the past few months has therefore resulted in a significant reduction of external capital and trade flows to Viet Nam. This has had wide-ranging effects throughout the Vietnamese economy, and is threatening to undermine its short-term prospects for recovery as well as its external balance.

Agricultural and industrial production has been disrupted by reduced supplies of fertilizer, crude oil and other raw materials and capital goods from the USSR, and by reduced demand in eastern Europe for Vietnamese exports. Industrial production appears to be suffering particularly severe shortfalls, with output in Ho Chi Minh City in the first nine months of 1990 reported to have reached only 68.6 per cent of the year's plan target.[3/] Faced with the threat of economic recession, the government has again begun to resort to deficit financing, with the deficits being widened by a resumption of subsidies to the State enterprises, which have suffered a sharp decline in profitability as a result of declining input availability and shrinking markets. This restoration of accommodative financial policies is threatening to provoke a resurgence of inflationary pressures and reverse the gains of the past year.

The rising cost of imported inputs and the contraction of export markets is also having serious repercussions on Viet Nam's balance of payments, with preliminary indicators suggesting a significant widening of the current account deficit in 1990. The deterioration of Viet Nam's external balance is being reinforced, moreover, by the accelerated repatriation of Vietnamese workers from eastern Europe, which is reducing the inflow of remittances from abroad while at the same time aggravating the existing social and economic strains within the country. The balance of payments pressures are likely to be exacerbated further in the coming year with the impending shift to the use of market prices and hard currencies in the conduct of trade relations within the CMEA.

In response to this unfavourable outlook, the government has taken a number of measures in recent months both to promote export revenues and conserve foreign exchange reserves. On 19 September 1990 the establishment of an export processing zone in Ho Chi Minh City was authorized, and on 23 September an official Vietnamese trade delegation was despatched to the Republic of Korea for the first time since the end of the Viet Nam war. On October 1 the government also announced further devaluation of the dong by 27.5 per cent in an attempt to maintain the international competitiveness of Vietnamese exports in the face of rising domestic inflation. The past few months have also witnessed the launch of an intensive campaign against smuggling, which is officially estimated to have resulted in the outflow of $100 million in cash and 24 tonnes of gold across the Cambodian border alone during the first half of 1990. This culminated in a decree to ban the sale of smuggled foreign cigarettes with effect from 1 October, with sharp fines being imposed on offenders.

On December 1, 1990 the Vietnamese Communist Party released a "Draft Platform for the Building of Socialism in the Transition Period" and a "Draft Strategy of Socio-Economic Stabilization and Development up to the Year 2000". The two documents are being circulated for public comment before they will be reviewed and discussed at the 7th Party Congress scheduled for May 1991. They imply a partial reversal of the recent policy initiatives through a "socialist-oriented commodity economy", and a call for renewed efforts "to build a planned economy, to bring into operation a market mechanism under State management". According to the drafts the State-run and collective sectors will continue to occupy "the predominant role". These policies, if adopted, would signal a different industrial policy environment for foreign direct investment in Viet Nam.

B. ECONOMIC STRUCTURE

Background: data limitations

An accurate representation of the structure of the Vietnamese economy is rendered extremely difficult by serious data limitations. These shortcomings in the statistical documentation of the Vietnamese economy arise from a variety of sources. At a superficial level, they reflect a number of weaknesses in the scope and methods of data collection and processing employed in the country, the effects of which have until recently been exacerbated by the adoption of very restrictive policies towards the public dissemination of the available data. At a deeper level, these weaknesses arise from the use of different methods of data interpretation and presentation than those most commonly in use elsewhere in the world. This, in turn, reduces the utility of the available official statistics in conveying an effective understanding of the economy and limits the scope for inter-country comparisons.

Although the collection and evaluation of comprehensive series of macroeconomic data anywhere in the world is subject to a range of widely acknowledged problems, they are heightened in Viet Nam by a severe shortage of appropriately trained and equipped manpower. The Vietnamese statistical service is thus believed to be heavily undermanned, and to have only limited access to computing facilities. A recent report on the Vietnamese economy notes, for example, that "Viet Nam has very few computers, and no

mainframes", and that as a result most calculations are done by hand. It argues further that "to exacerbate the situation, communications are extremely difficult and the country has a paper shortage", and concludes that "nearly all available data should be treated as the 'best guesses' of individuals untrained in Western methods of accounting or statistics, holding incomplete or incorrect information". It also points out that until 1989 all economic data were considered State secrets, so that very few data series exist.[4/]

The interpretation and presentation of the government's data pose further difficulties. In common with other socialist countries, Vietnamese statistics thus commonly distinguish between institutional as well as industrial sectors. In these statistics the output of the "socialist" sector, comprising State enterprises and co-operatives, is clearly differentiated from that of the private sector, with the relative strength of the latter frequently being understated because of the usually only perfunctory efforts made to assess its full impact on the economy.

In addition, Viet Nam has traditionally followed the material product system of national income accounting, which is concerned only with the estimation of the economic contribution of activities directly related to material production. It therefore ignores the contribution to national income made by a variety of economic activities, consisting chiefly of services such as housing, health, education and banking, which do not directly result in the production of material outputs. Although estimated values of these missing components of national product can be inserted into the Vietnamese national accounts statistics in an attempt to make them compatible with the standard United Nations System of National Accounts (UNSNA) employed throughout the non-socialist world, such an exercise would almost inevitably be subject to a wide margin of error.

Such an effort to revise the standard Vietnamese national income data in order to make them broadly compatible with the UNSNA has nevertheless been attempted by the Vietnamese authorities in conjunction with a number of international agencies such as the International Monetary Fund, the United Nations Development Programme, and the United Nations Economic and Social Commission for Asia and the Pacific. The results of this effort represent the best available estimates of Viet Nam's national income, and are reproduced in Table I.1. Even these revised data are far from perfect, however, and contain two important weaknesses.

The first of these weaknesses follows from the fact that the underlying data are derived essentially by the simple process of aggregating the output of individual producers and industrial sectors. With no corresponding measures being taken to complement the estimates of national output so derived with matching measurements of national income or national expenditure, the demand components of GDP can only be guessed at. The second weakness of these data is that the associated nominal GDP values appear seriously to underestimate the actual value of total national income and national income per caput, especially when converted into US dollars at the prevailing rates of exchange. This has been highlighted by the previously quoted report prepared by the State Planning Committee of the Government of Viet Nam and the United Nations Development Programme, which shows that even the adjusted national accounts data yield an average income per head of only about $100 in 1988. Arguing that this estimate appears implausibly low, the authors of the report show that considerably more credible GDP per caput estimates of some $150-200 can be derived from these data if appropriate adjustments are made.[5/]

Some efforts have been made by the Vietnamese authorities to provide a more comprehensive statistical coverage of the country's economy in the recent past. The State Planning Committee of Viet Nam has contributed a variety of such data to a number of mission reports produced jointly with international agencies since 1987, and the General Statistical Office has published two important surveys of socio-economic statistics covering 1930-1984 and 1976-1989.[6/] The latter publication in particular is relatively comprehensive, although most data series cover only the second half of the 1980s. The data for 1989 contained in this survey are officially described as preliminary, and counter-intuitive drops in the 1989 values of many series suggest that they may be based on only a partial enumeration. At the same time, however, some of the output reductions noted in these series may be real, and reflect the impact of the anti-inflationary austerity measures adopted by the Government of Viet Nam in 1989.

In view of the data limitations discussed above, any attempt to sketch the structure of Vietnamese economy must perforce be highly impressionistic. The substantial scope for error inherent in such an effort is heightened, moreover, by the accelerating pace of the economic change taking place in Viet Nam at present in response to the *doi moi* programme of economic restructuring currently in progress in the country. These changes are manifesting themselves in a transformation of the institutional structure of the economy, as the once overpowering dominance of the "socialist" sector is gradually being whittled away as a result of the increased official encouragement being given to the private sector. They also manifest themselves in the

emergence of a more balanced industrial structure, as the accelerating growth in investment in the manufacturing and other sectors of the economy erodes the leading role of agriculture in the Vietnamese economy.

Overall structure

Bearing in mind the caveats discussed above, the best available quantitative estimates of the Vietnamese economy's institutional and industrial structure are presented in Tables I.1 and I.3 respectively. Table I.3 shows that the share of the socialist sector of the Vietnamese economy expanded rapidly in the first decade or so after reunification, from less than 60 per cent in 1976 to a peak of 75 per cent in 1987. With the share of State-owned enterprises remaining broadly unchanged at about 35-37 per cent during this period, the growth of the socialist economy was accounted for principally by a dramatic increase in the role of the co-operative sector, which expanded its share of the total economy from only 22 per cent in 1976 to more than 37 per cent by 1987. This process of co-operativization was concentrated mainly in the agricultural areas of southern Viet Nam, and was implemented at a particularly rapid rate after 1983. In more recent years, its pace has slowed down, although the data in Table I.3 suggest that it had not yet begun to be reversed by 1988. These data do show a marked decline in the role of the State enterprises in 1988, however, in response to the liberalizing economic reforms adopted by the government from the end of 1986 onwards.

Table I.3. Distribution of gross material product by socialist and private sector, 1976-1988
(Percentage)

	Socialist economy			Private economy	Total
	State enterprises	Co-operatives	Sub-total		
1976	36.9	22.0	58.9	41.1	100.0
1977	...	...	...	...	100.0
1978	...	...	...	...	100.0
1979	...	...	...	...	100.0
1980	35.5	24.8	60.3	39.7	100.0
1981	...	...	...	...	100.0
1982	...	...	...	...	100.0
1983	...	...	...	...	100.0
1984	35.2	31.0	66.2	31.0	100.0
1985	35.7	35.2	70.9	29.1	100.0
1986	37.3	34.8	72.1	27.9	100.0
1987	37.9	37.1	75.0	25.0	100.0
1988	33.4	38.2	71.6	28.4	100.0

Sources: Official data provided by Vietnamese authorities, as cited in Socialist Republic of Viet Nam, State Planning Committee and United Nations Development Programme, *Report on the Economy of Viet Nam*, January 1990, page 29.

The data in Table I.1 present an indication of the approximate size of the Vietnamese economy and its composition by industrial sector. The estimates of the economy's overall size are, as discussed above, subject to a considerable margin of error arising from both conceptual and computational problems. While a precise quantification of the Vietnamese economy's size may be hindered by data limitations, however, there can be little doubt that Viet Nam is one of the poorest countries in the world, with its GDP per head falling well within the lower half of the range of less than $410 used by the World Bank to define "low income" countries.

With regard to the industrial structure of the Vietnamese economy, Table I.1 shows that agriculture remains the single most important sector, although its share in total output has been declining gradually from an estimated 45 per cent in 1983 to approximately 39 per cent in 1988. This relative decline in the importance of the agricultural sector has been compensated for almost entirely by a corresponding increase in the role of the industrial sector (including mining, manufacturing, and the production of electricity, but excluding construction and the provision of other public utilities) from less than 22 per cent in 1983 to almost 27.5 per cent in 1988. The shares of all other sectors, meanwhile, are shown by Table I.1 to have remained virtually unchanged since 1983.

Agriculture

Despite the long standing (and, as noted above, not entirely unsuccessful) efforts of the Government of Viet Nam to effect a structural transformation of the country's economy from an overriding dependence on agriculture to a more balanced sectoral composition, Viet Nam remains a predominantly agricultural country. Not only does the agricultural sector continue to account for approximately two-fifths of the value of the country's total economic output, but it also still absorbs more than 70 per cent of its employed labour force and provides some 30 per cent of its export earnings. With the bulk of the Vietnamese farm population still living at subsistence level and producing a wide range of commercial crops in addition to staple foods, the agricultural sector also represents a major reservoir of the Vietnamese economy's future development potential.

The structure of the agricultural sector has to a large extent been determined by the ideological predilections of the Government of Viet Nam. In the northern part of the country, where communist power was effectively established soon after the end of World War II, the new government's urge to accomplish a "socialist transformation" of the economy with the minimum of delay resulted in the extensive redistribution and subsequent co-operativization of cultivable land during the 1950s. Following the reunification of Viet Nam in 1975, this policy was extended to the south of the country, where the bulk of the farming land was co-operativized or collectivized in two great waves following the introduction of the First National Plan in 1976 and the adoption of a new constitution in 1981.

Farmer resistance to a rigorous implementation of many of the government's more doctrinaire agricultural policies has often been considerable, however, and has usually manifested itself in sharp falls in agricultural production. This, in turn, has usually forced the government to adopt a more flexible approach towards agricultural policy, although the restoration of reasonable production levels frequently resulted in the re-imposition of a more rigid policy stance. Especially since the reunification of the country, agricultural policy in Viet Nam has therefore vacillated between socialist orthodoxy, accompanied by reduced output levels, and pragmatism, resulting in a recovery of production. The latest stage in this cycle, which appears more permanent than its predecessors, was initiated in April 1988 through the promulgation of Decree No 10 by the Politburo, which re-established the family farm as the basic unit of agricultural production and resulted in the effective, *de facto* if no *de jure*, disbandment of many of the agricultural co-operatives established in the southern part of Viet Nam in the late 1970s and early 1980s.

Three forms of agricultural landholding are now recognized by the State in Viet Nam. The first of these categories is State-owned land, which is mostly cultivated by large State-owned farms, managed either by the central or local government. The second category covers collectively-owned land, which is operated by producer co-operatives and other collective farms. The third category covers individual landholdings, which are farmed by small family units. The latest available data indicate that such small landholdings accounted for approximately 53 per cent of total agricultural output in the late 1980s, with co-operatives accounting for 45 per cent of production and State-owned farms for the remaining 2 per cent. As a result of the rapid changes in the patterns of agricultural organization triggered by Decree No 10 of April 1988 and other recent policy measures, however, the share of agricultural output accounted for by the family farms is certain to have increased substantially in the recent past.

The principal crop produced by the co-operative and family farm sector is rice. This is cultivated principally in the Mekong River delta in southern Viet Nam and in the Red River delta in northern Viet Nam, with the former being by far the more important of the two rice growing regions. Other important food crops grown by co-operatives and small farms include maize, potatoes, sweet potatoes and cassava. The 446 State-owned farms, which are operated either by the central government or by local (provincial or district) governments, concentrate mainly on the production of commercial crops and livestock. The main cash crops grown on these farms include tea, coffee, sugar-cane, cotton, rubber and pineapples. Growing concern about the

inefficient use of resources by State farms in the past few years has resulted in the introduction of several recent reforms. These have granted the farms an increased degree of operational autonomy and in some cases have resulted in the State farms being required to concentrate on opening up new land, which is subsequently to be contracted out in small plots to family farmers.

Recent agricultural production data are presented in Table I.4. They indicate an uneven growth performance during the latter half of the 1980s, with many crops experiencing substantial year to year fluctuations and several suffering stagnating output levels. Increases in rice production in particular were particularly disappointing in the years to 1988, with the estimated availability of 144 kg of milled rice per caput in 1986 falling short of optimal nutritional requirements even despite a record output level of 16 million tonnes of paddy in that year. These food shortages, which were aggravated in 1987 by a drop in rice production caused by drought, provided the main impetus for the agricultural reforms introduced during the past two years.

The impact of these reforms has been dramatic, with some reports suggesting that paddy production in 1989 exceeded the official estimate cited in Table I.4 by a considerable margin, and may even have surpassed 21 million tonnes.[7/] From being a substantial net importer of rice for most of the 1980s, Viet Nam became the third largest rice exporter of rice in 1989 with shipments of approximately 1.4 million tonnes. All available indicators suggest that a further substantial increase in rice output is likely to be recorded in 1990, although the rate of this increase may be constrained by the effect of reduced fertilizer imports from the USSR as noted above.

Table I.4. Agricultural production, 1985-1989[a/]
(1,000 tonnes)

	1985	1986	1987	1988	1989
Paddy	15,870	16,000	15,100	17,000	18,927
Maize	587	570	561	815	843
Sweet potatoes	1,778	1,959	2,202	1,902	1,906
Potatoes	189	305	498	347	331
Cassava	2,940	2,882	2,738	2,839	2,560
Groundnuts	201	211	232	214	204
Soya beans	79	95	96	95	104
Cotton	5	5	4	4	...
Rush	93	98	104	84	82
Mulberries	56	57	150	150	...
Tobacco	38	33	33	36	24
Sugar-cane	5,560	4,965	5,470	5,700	5,255
Jute	47	55	58	37	36
Tea	...	30	29	30	32
Coffee	12	19	21	31	41
Rubber	48	50	52	48	51
Coconut (fruit)	612	711	806	556	...
Pepper	1	4	5	6	7

Sources: State Planning Committee, *Plan for Social-Economic Development 1989*, as cited in Socialist Republic of Viet Nam, State Planning Committee and United Nations Development Programme, *Report on the Economy of Viet Nam*, January 1990, page 84. Socialist Republic of Viet Nam, General Statistical Office, *Statistical Data of the Socialist Republic of Vietnam 1976-1989*, Statistical Publishing House, Hanoi, 1990, page 33.

a/ Totals may not add due to rounding.

Manufacturing

The Vietnamese authorities have historically given considerable priority to the expansion of the industrial sector, which has responded with an impressive growth performance in recent years despite the almost certainly inaccurate preliminary estimate for 1989 shown in Table I.1. Even accepting the 1989 estimate, however, the data show that industrial output expanded at an annual average rate of almost 6.6 per cent in real terms between 1983 and 1989, well above the overall GDP growth rate of 4.7 per cent per annum recorded during this period. As noted above, this has reinforced the industrial sector's position as the second most important source of the country's GDP, with a share of almost 24.3 per cent in 1989. Employment data presented in Annex Table A-4 show that industry plays an important role in labour absorption, with 11.7 per cent of Viet Nam's employed labour force being engaged in industrial activities in that year.

Organized industrial production in Viet Nam has traditionally been concentrated in the "socialist" sector of the economy. Although the distinction between the State and private sector is increasingly being blurred as a result of the recent reforms granting operational autonomy to State-owned firms and permitting the establishment of joint ventures between public and private enterprises, and although the various measures adopted by the Government of Viet Nam in recent years to attract increased private sector participation in manufacturing industry have eroded some of the State sector's dominance in industrial production, this pre-eminence of the State sector in manufacturing industry has persisted to a very considerable extent. The production of heavy industrial goods thus remains concentrated in some 700 firms owned by the central government, while the manufacture of light industrial goods is centred in a further 2,400 enterprises owned by regional and local governments, and small-scale manufacturing is dominated by co-operatives. The private sector continues to be restricted largely to the production of handicrafts.

The differences in the historical evolution of northern and southern Viet Nam have resulted in the emergence of significant regional variations in the patterns of industrialization between the two regions. Greater emphasis has been placed on the development of a manufacturing industry in the northern part of the country since the colonial period, when the port of Haiphong became Viet Nam's main cement producer and textile industries were established in the cities of Nam Dinh and Hanoi. This emphasis on industrial development in the north was reinforced during the period of partition, when orthodox communist strategies aimed at the establishment of a heavy industrial base were pursued. As a result, the northern part of Viet Nam currently accounts for the bulk of the country's heavy industry, including iron and steel, chemicals, cement, fertilizer and vehicle manufacturing, with the consumer goods sector in the north being dominated by small-scale co-operative enterprises and artisanal establishments.

In the south, meanwhile, the adoption of more market-oriented policies during the period of partition facilitated the development of efficient light industrial enterprises and the associated management skills. Despite the dislocations of the first decade after reunification, these have now re-emerged, and constitute the prime engine of Viet Nam's industrial growth. Two-thirds of Viet Nam's manufacturing output is thus estimated to be produced in the south of the country now, with much of it originating from non-State enterprises.

The increasing importance of light manufacturing in Viet Nam's industrial sector is underlined by the data in Table I.5, which indicate that the share of the light industrial sector in total industrial production is tentatively estimated to have increased from 65.9 per cent in 1983 to 71.1 per cent in 1989, implying an annual average growth rate of 9.4 per cent. This contrasts with an estimated growth rate for the heavy industrial sector of 5.2 per cent per year. Interestingly, moreover, this much more rapid growth in output in the light industrial sector was achieved at substantially lower investment costs, which amounted to only 20 per cent of total industrial investment in 1983 and 26 per cent in 1984-1986.

Official data released by the Vietnamese authorities indicate further that the once dominant role of heavy industries in labour absorption has also gradually been eroded in the past few years. While heavy industries thus employed 298,100 workers and light industries employed 221,100 workers in 1976, this pattern had been reversed by 1988, when heavy industries employed 410,100 workers and light industries employed 433,800 workers. As is indicated by the data in Annex Table A-5, moreover, labour productivity has also been rising much more rapidly in the light industrial sector than in heavy industry. These data thus suggest that gross industrial output per employee rose by approximately 4.8 per cent per annum in the light industrial sector, but by only 2.8 per cent per annum in the heavy industrial sector in the four years to 1987.

Table I.5. Industrial production and investment, 1983-1989[a/]
(Billion dong, at constant 1982 prices)

	1983	1984	1985	1986	1987	1988	1989
Gross industrial production	83.03	93.95	105.34	111.75	122.38	137.83	132.34
By sector:							
Heavy industry	28.30	30.94	34.46	36.00	39.39	40.88	38.30
Light industry	54.73	63.02	70.88	75.75	82.99	96.95	94.04
By type of management:							
Central government	29.11	32.61	35.62	37.72	40.15	44.41	43.61
Local government	53.93	61.35	69.72	74.03	82.23	93.42	88.73
By industry:							
Energy, combustibles	5.42	5.48	6.05	7.05	7.56	7.40	7.48
Metallurgy	1.15	1.21	1.35	1.59	1.69	2.06	2.06
Machinery and engineering	11 01	12.35	14.68	16.27	18.61	23.96	20.95
Chemical industry	8.00	9.66	11.21	10.82	12.08	12.98	13.16
Construction materials earthenware, porcelain, glassware, wood, forest products, cellulose, paste, and paper industries	17.95	19.36	21.06	22.92	24.47	24.43	22.26
Food and foodstuffs	22.33	25.59	28.91	29.76	32.46	36.96	37.33
Weaving, leather, sewing dyeing, printing and cultural products	14.01	16.57	17.77	18.83	20.88	24.22	23.45
Other industries	2.90	3.38	3.93	4.06	4.84	5.83	5.65
Investment in industry	7.50	7.80	...	7.40	...	...	...
By sector:							
Heavy industry	6.00	5.80	...	5.50	...	...	...
Light industry	1.50	2.00	...	1.90	...	...	...

Sources: General Statistics Office, *Statistical Data 1930-1984*, and other official data provided by Vietnamese authorities, as cited in International Monetary Fund, *Viet Nam - Recent Economic Developments*, Memo from the Secretary to members of the Executive Board dated May 11, 1988, page 11, and data provided by Vietnamese authorities as cited in United Nations Industrial Development Organization, *Viet Nam's Industrial Development - As Assessment*, Report by the Regional and Country Studies Branch, Industrial Policy and Perspectives Division, UNIDO, Vienna, August 1989, page 27 (data for 1983-1985). Socialist Republic of Viet Nam, General Statistical Office, *Statistical Data of the Socialist Republic of Viet Nam 1976-1987*, Statistical Publishing House, Hanoi, 1990, pages 72, 75 and 76.

a/ Totals may not add due to rounding.

Mining and energy

Various geological surveys have indicated that Viet Nam is endowed with a wide range of mineral resources, including commercially viable reserves of coal, oil, bauxite, iron ore, tin, chromite, copper, zinc, graphite, mica, ilmenite, nickel, manganese, titanium, gold, gemstones, and apatite. The country's mining sector remains largely underdeveloped, however, with many of the available mineral reserves remaining unexploited. Those that are exploited, moreover, are often extracted using outdated equipment and technology, so that mining operations in Viet Nam are frequently characterized by low levels of output and productivity.

The principal mineral currently being exploited is coal, of which Viet Nam has proven reserves of 3.0-3.5 billion tonnes, and which is currently mined mainly in the north-eastern Quang Ninh province. Viet Nam's coal mining activity is officially acknowledged to be seriously constrained by frequent equipment failures and supply shortages, however, as a result of which only some 75 per cent of the existing coal mines' design capacity of 8.8 million tonnes per year can currently be utilized. Output is nevertheless more than sufficient to meet domestic demand, and much of the surplus of some 500,000 to 700,000 tonnes per year is exported to Japan and the Republic of Korea.

Crude oil is another valuable mineral resource with considerable potential for development, with several offshore fields believed to contain reserves of up to 4 billion barrels.[8/] The first attempts to develop these fields were initiated in the early 1970s, but these were abandoned because of changing political circumstances. The modern Vietnamese oil industry therefore has its origins in the signing of exploration agreements with the USSR for three offshore fields off the southern coast in 1980. Of these, only two have been brought into production so far; the Bach Ho (White Tiger) field was brought into production in 1986, and currently produces about 55,000 barrels per day, while the Dai Hung (Big Bear) field commenced production in mid-1990. Following the implementation of the 1987 foreign investment law, several further oil exploration agreements have been signed with a number of foreign companies, although United States firms have been prevented from applying for concessions because of the continued operation of United States sanctions.

Even though Viet Nam's oil production levels are now rapidly approaching the levels required to satisfy domestic demand, the bulk of this output is exported to Japan and Singapore in return for refined petroleum products and Viet Nam also continues to import some 22 million barrels of refined products per year from the USSR. The development of a major onshore marketing and refining centre, which may form the basis for the subsequent development of a petrochemicals industry, has been under consideration for some time. The economic viability of such a project, which would require the construction of undersea pipeline from the offshore oilfields remains uncertain, however, and is currently being evaluated.

The only other mineral resource to be exploited in any appreciable volumes is apatite, of which Viet Nam is estimated to have reserves of up to 1 billion tonnes. They are currently being mined in conjunction with the USSR at a rate of approximately 1.5 million tonnes per year to produce phosphate fertilizer and insecticides.

Despite a gradual increase in power generating capacity in recent years, Viet Nam's electricity supply situation remains precarious. "Brownouts" and power failures continue to occur at frequent intervals and cause considerable disruption and inconvenience. Several major power projects are under construction, however, and their gradual coming on stream is beginning to ease the situation. The principal problem that will then have to be resolved will be the linking up of the at present still separate and unconnected power supply systems in northern, central and southern Viet Nam through the construction of a high voltage transmission network and the establishment of a national grid.

Banking and finance

Like the rest of the Vietnamese economy, the country's banking system is currently in a state of transition and undergoing a rapid pace of structural change. As discussed in Chapter II (see Monetary policy), this still ongoing process of restructuring was initiated in April 1988, when a number of important financial sector reforms were introduced, which greatly enhanced the banking sector's economic role beyond the mere provision of financial resources to meet the government's fiscal deficit and fulfil its economic planning targets. Despite these developments, however, Viet Nam's banking system remains embryonic, and the remainder of the financial services sector severely underdeveloped.

The banking system is headed by the State Bank of Viet Nam (SBV), which since the 1988 reforms has begun to fulfil the functions of a conventional central bank. It supervises and regulates the activities of the other banking institutions in the system, issues currency in accordance with the broad policy objectives set by the Council of Ministers, and acts as a banker of last resort. Since March 1989 it has also been given the responsibility for managing Viet Nam's foreign exchange reserves. To assist the SBV in its task of co-ordinating the activities of the banking system, a National Banking Council has been established with local counterparts in each province. In addition, a National Monetary and Finance Committee chaired by the Minister of Finance has also be installed to co-ordinate the government's monetary and fiscal policies.

The SBV is supplemented by four specialized State-owned commercial banks and a number of small private banks which have recently been allowed to become established on an experimental basis. The four State-owned commercial banks comprise the Bank of Foreign Trade (BFT or Vietcombank), Bank for Investment and Construction (BIC), the Bank for Agricultural Development (BAD) and the Bank for Commerce and Industry (BCI), all of which specialize in the fields of activity suggested by their names. Of these, the BAD and BCI were only established in 1988 in connection with the banking reforms of that year. The other minor banks currently operating in Viet Nam include two local joint stock banks, the Bank for Industry and Trade (BIT) and the Export-Import Bank (EIB), and a joint venture operation known as Indovina Bank Ltd

between the BCI and the Indonesian Summa banking group. In addition, several other foreign banking groups, including the Banque Français du Commerce Extérieure, Banque Indosuez, Banque Nationale de Paris, Société Générale, Crédit Lyonnais, Thai Military Bank, Hong Kong and Shanghai Banking Corporation, and Standard Chartered Bank are reported to have received permission to open representative offices in Viet Nam.[9/]

The relatively small size of the Vietnamese banking sector is matched by its equally limited degree of sophistication and range of services. Nearly all of the country's banks lack computerized systems, and relatively straightforward transactions such as telegraphic transfers, clearance of cheques and payments of letters of credit involve inordinately long delays. Largely as a result of Viet Nam's extended history of high inflation, moreover, bank deposits have traditionally been regarded with some suspicion. Cheque and savings accounts appear to have gained some popularity in the past year or so, however, following the containment of inflation and the introduction of positive real interest rates. In a sharp reversal of established trends, the BFT attracted deposits of dong 900 billion in the first eleven months of 1989.

In other respects also, the provision of financial services is gradually improving. A particularly noteworthy development in this connection was an agreement between the Vietcombank and the Banque Francais du Commerce Extérieure to introduce the Visa credit card network into Viet Nam on 19 July, 1990. While this development will have only a limited direct effect on the financial sector for the foreseeable future, it will provide a service to visiting businessmen and tourists and hence add to Viet Nam's attractiveness for these groups of foreign visitors.

Of wider relevance and impact has been the collapse in early 1990 of several privately operated credit co-operatives which began to be tolerated by the government in the wake of the deregulatory reforms of the past two years. Two such institutions in particular, associated with the Thanh Huong Perfume Co. and a construction company called Xacogiva, proved to have been used for clearly fraudulent purposes by their operators. Their collapse resulted in large-scale demonstrations by aggrieved depositors in both Hanoi and Ho Chi Minh City, and severely dented public confidence in private sector banking activities. In order to assuage the mounting public bitterness, the Council of Ministers was eventually forced to issue a directive stipulating tighter control over such credit co-operatives in September 1990.

In late 1990 the government announced it was restructuring its banking system, establishing four autonomous national commercial banks and placing the Central Bank under a board of directors. The reform outlined in a November 14 decree, envisages the establishment of four new financial independent banks: Bank for Agriculture, Bank for Investment and Development, Bank for Trade and Industry and Vietnamese Bank for Overseas Trade. Each of the four new banks will be legal entities with independent accounting and financial autonomy. They will be based in Hanoi and will have branches throughout the country.

Trade and services

Viet Nam's transport and communications infrastructure suffers from a variety of inadequacies. The road network is in a serious state of disrepair, and only about 40 per cent of it is surfaced with asphalt or tar. At least half of the country's road bridges consist of semi-permanent or temporary structures, and some 50 important river crossings continue to be serviced by ferries or pontoons. The motor vehicle density (excluding motorcycles) amounts to approximately one per thousand inhabitants, with a significant proportion of even the existing fleet being obsolescent. Bicycles provide the principal means of personal transport in Viet Nam, which is estimated to have some 20 million of them in use.[10/] In some of the wealthier parts of southern Viet Nam, and especially in Ho Chi Minh City, they are gradually being replaced by motorcycles, of which some 350,000 are reported to be in use.

The Vietnamese railway network, which suffered severe damage during the war, is in a similarly poor state of repair, with much of the war damage only having been repaired on a temporary basis. The track bed is in a poor state, the rails and sleepers are frequently in an unsafe condition, and the signalling system is rudimentary. Approximately 100 of the system's 480 locomotives are steam powered, and some of them are more than 60 years old. About half of the freight and passenger wagons in use by the Vietnamese railways are also more than 40 years old, and almost all are in an advanced state of disrepair. Faced with all these difficulties, the Vietnamese railways often find it difficult even to meet their already generous allocation of 48 hours for the 1,730 km journey between Hanoi and Ho Chi Minh City.

Other transport facilities are also suffering from a substantial degree of underinvestment. The highly important inland waterway networks along the Mekong and Red River systems are in urgent need of dredging, the sea and river ports are congested and poorly equipped, and domestic air transport services provided by the national airline, Air Viet Nam are both limited and unreliable. The telecommunications system, meanwhile, is severely antiquated, inadequate and inefficient. In August 1990 however, Overseas Telecommunications International (OTCI) based in Sydney, signed a contract to invest $80 million to upgrade Viet Nam's international telecommunications system over the next 10 years.

The deterrent effect of the poor infrastructure on economic development in general and the inflow of potential private investment in particular is widely recognized, and several measures have either been taken or begun to be considered in the recent past to alleviate Viet Nam's many serious infrastructural bottle-necks. While they persist, however, they have the effect of seriously disrupting inter-regional trade flows within Viet Nam. Already the absence of an effective transport network has resulted in a disintegration of the Vietnamese market into four essentially independent and unconnected regional markets centred on Hanoi and Haiphong in the north, Da Nang and Hue in the central region, Nha Trang and Phan Rang in the south central region, and Ho Chi Minh City in the south.

C. ECONOMIC PROSPECTS

Viet Nam lies at the heart of one of the most dynamic regions in the world, and is surrounded by some of the world's strongest and fastest growing economies. The industrial powerhouse of Japan lies some 5,000 km to the north east, while the now almost mature industrial economies of the Republic of Korea, Taiwan Province of China, Territory of Hong Kong and Singapore lie between 2,000 and 5,000 km away. At even closer proximity are the rapidly industrializing and developing economies of the ASEAN group of nations - Brunei, Indonesia, Malaysia, the Philippines, Singapore and Thailand - most of which have recorded annual average growth rates of 6-12 per cent in the recent past. As the already extensive regional integration of trade and investment flows intensifies in the coming years, Viet Nam stands to derive considerable economic benefits merely from its fortuitous location. Regional businessmen facing increased wage demands in their own increasingly advanced economies and seeking alternative low-cost production sites are increasingly likely to be attracted to Viet Nam, for example, as are businessmen from outside the region seeking to capitalize both on the country's relatively low cost structure and its proximity to the rapidly expanding markets of south east and east Asia.

Clearly, the achievement of Viet Nam's potential to attract the capital flows needed to accelerate its own economic development will depend to a large extent on the consistency and constancy of government policy. In particular, it will depend on the perception of foreign investors regarding the government's ongoing commitment to the programme of economic liberalization, *doi moi*, that it initiated at the end of 1986. If the government is seen to be serious in its resolve to proceed on the path of economic reform, and if it continues to adopt pragmatic, market-related economic policies, the investment momentum that has already been generated in the last two years is certain to be sustained and to give rise to a period of steady economic growth. As the infrastructural and financial bottle-necks currently inhibiting investment growth are gradually overcome, moreover, the rate of growth will further accelerate.

The relatively favourable medium- to long-term outlook for Viet Nam's economic development presented here is supported by the increasing likelihood that the United States Government may lift its economic sanctions on Viet Nam in the not too distant future. The dramatic shift in the United States Government's long standing anti-Vietnamese stance on the Cambodian issue announced in July 1990 was widely interpreted as a first step towards a gradual easing of tensions between the two countries. Though domestic political considerations will cause the United States Government to proceed with considerable caution towards a normalization of bilateral relations, the process will almost certainly be supported vigorously by the United States business community, which has already begun to demand a relaxation of official United States strictures in order to be able to compete for a share of what it believes to be a rapidly growing market with considerable potential. Once United States entrepreneurs succeed in having the sanctions lifted, their expectations of Viet Nam's growth prospects will almost inevitably become self-fulfilling as not only they but also their rivals from elsewhere step up the competition for trade and investment links with Viet Nam, and as the removal of sanctions unlocks the door for increased financial assistance from the International Monetary Fund and other multilateral and bilateral lenders.

This generally favourable longer term outlook notwithstanding, Viet Nam faces a number of critical economic problems in the short term, which have arisen primarily from the sudden and dramatic changes in its

international trading relationships during the past year. In confronting the economic shocks generated by these changes, the Government of Viet Nam will inevitably have to continue along the path of structural adjustment that they have already embarked upon. The policy responses adopted by the authorities in recent months suggest that they recognize and accept this continuing need for economic restructuring, and are prepared to implement it. This bodes well for the eventual achievement of the more favourable longer term prospects.

NOTES TO CHAPTER I

1/ Harvey Demaine, "Vietnam - Economy", in *The Far East and Australasia 1990*, Europa Publications, London, 1989, page 1036.

2/ Socialist Republic of Viet Nam, State Planning Committee and United Nations Development Programme, *Report on the Economy of Viet Nam*, January 1990, page 33.

3/ *Asian Wall Street Journal*, 9 October 1990.

4/ Christopher F. Bruton and Mathilde L. Genovese, Vietnam: An Investor's Appraisal, *Business International Asia-Pacific*, Hong Kong, June 1990, pages 34-35.

5/ Socialist Republic of Viet Nam, State Planning Committee and United Nations Development Programme, *Report on the Economy of Viet Nam*, January 1990, pages 42-43.

6/ Socialist Republic of Viet Nam, General Statistical Office, *Statistical Data of the Socialist Republic of Vietnam 1930-1984*, Statistical Publishing House, Hanoi, 1989. Socialist Republic of Viet Nam, General Statistical Office, *Statistical Data of the Socialist Republic of Vietnam 1976-1989*, Statistical Publishing House, Hanoi, 1990.

7/ Roger Matthews, Rice Thrives as Marxism Takes a Back Seat, *Financial Times*, London, 8 March 1990.

8/ Christopher F. Bruton and Mathilde L. Genovese, Vietnam: An Investor's Appraisal, *Business International Asia-Pacific*, Hong Kong, June 1990, page 49.

9/ *Ibid*, page 65.

10/ *Ibid*, page 56.

II. THE MACROECONOMIC AND INDUSTRIAL POLICY ENVIRONMENT

A. MACROECONOMIC POLICY

Central planning

As suggested in Chapter I, the macroeconomic policy environment in Viet Nam is currently in the process of transition, with considerable changes being made in all fields of government policy in order to enhance the role of market forces. In general terms, however, the Vietnamese economy continues to be organized along socialist lines, with most large scale means of production tending to be collectively owned and many resources being allocated through a mechanism of centralized planning. The planning process is centred on the State Planning Committee (SPC), an advisory agency responsible to the Council of Ministers which formulates five-year plans to establish medium-term priorities and targets. These five-year plans form the basis for annual economic plans, which set specific targets, usually in physical terms, for sectoral outputs and investments, and also specify the volumes and patterns of input allocation. With primary importance being given to the achievement of the physical plan targets, financial policies have historically been oriented mainly towards accommodating the requirements of the physical plan.

Price policy

One of the main distinguishing features of the socialist economic system as practised in Viet Nam has been the attempt to regulate prices in accordance with planning requirements rather than market signals. Even though a free market dealing primarily in goods produced in excess of planning targets has been allowed to persist, prices of both consumer goods and production inputs have traditionally been subject to official control. This control has been exercised mainly in conjunction with a rationing system, under which specific quantities of essential goods have been sold to civil servants, employees of State enterprises, pensioners, students and welfare recipients at prices set on social welfare grounds and according to the customer's rank rather than on the basis of production costs or market fundamentals.

This policy gave rise to growing disparities between official and market prices, which were sustained by the government's pursuit of accommodative financial policies. Apart from provoking a distortion of consumption and production patterns, this approach generated a need for increasing budgetary subsidies as well as mounting inflationary pressures. The strains imposed by these developments became unsustainable by the mid-1980s, and prompted the wide ranging reform of the price and subsidy system noted above. As a result of these reforms prices throughout the agricultural sector now reflect free market levels, and the proportion of State enterprise output sold at market prices increased from only about 20 per cent in 1988 to more than 80 per cent by the end of 1989.

Price developments since 1981 are illustrated in Annex Table A-1, which indicates that the general consumer price index covering both the free and the regulated official markets rose by an annual average of 70 per cent in 1981-1984. From 1985 onwards, however, inflation accelerated sharply to almost 500 per cent in 1986 before easing gradually by 1989. As the free market gained increasing importance by the latter year, moreover, the rates of inflation in private and official markets began to converge, and since the beginning of 1989 only a single inflation rate has been calculated by the Vietnamese statistical authorities, with no distinction being made between official and market prices.

Fiscal policy

Fiscal policy in Viet Nam has traditionally been aimed at facilitating the achievement of the physical production targets of the annual State economic plan. The principal objectives of the State budget have therefore included the provision of wages, salaries and food subsidies to public employees, the implementation of the annual investment plan, the transfer of resources to State-owned enterprises, and the subsidization of some products and enterprises. Beyond meeting the need to finance the government's output targets, fiscal policy has played a limited role in Viet Nam, and it has recently been argued that "the budget was not conceived as an instrument to restore economic balance, to ensure optimum allocation of resources or to redistribute income".[1/]

The budgetary transactions of the Government of Viet Nam since the early 1980s are summarized in Annex Table A-7. A particularly striking feature of these transactions is the dramatic increase in their nominal

value in response to the high rates of inflation experienced in the latter years of the decade. As indicated above, however, this inflation itself had its origins mainly in the rising expenditure commitments imposed upon the government by the need to accommodate the financial requirements of the annual economic plans while structural constraints prevented a matching increase in fiscal revenues. Despite considerable inflows of external assistance, a substantial proportion of the resulting large budgetary deficits had to be covered by public borrowing from the domestic banking system, which inevitably had a severe inflationary impact. This vicious circle of inflation, fiscal deficits and monetary expansion was only broken by the wide ranging economic reforms adopted in 1988-89, and especially by the measures to reduce the government's budgetary subsidies noted in Chapter I.

The revenue constraints confronting the Government of Viet Nam in the second half of the 1980s are illustrated clearly in Annex Table A-7, which shows that it had become heavily dependent on non-tax revenues in the years to 1987. A particularly important role was played by transfers from State-owned enterprises, which accounted for approximately 75 per cent of total government revenue in 1984-1987. This figure substantially underestimates the true macroeconomic impact of the State budget's reliance on such transfers since the liabilities of the State enterprises were computed on the basis of administered costs and prices rather than realized profits, and since the State enterprise sector itself depended heavily on bank credit.

From 1988 onwards a number of measures were introduced granting increased financial autonomy to State enterprises, which resulted in a substantial reduction in the demands placed on these firms to support the State budget. These measures were matched by corresponding steps to correct the inadequacy of the government's tax revenue, which had been the principal cause for the emergence of the government's budgetary dependence on State enterprise transfers. In late 1987 a new tax was imposed on exports and commercial imports, and a number of revisions were made to the tax system, with the rates or bases of the licence tax, the turnover tax, the profit tax, and other commodity taxes being raised in response to inflation. The depreciation of the dong and the increase in agricultural procurement prices in 1988-89 also had the effect of raising the yield of the import tax and the agricultural tax. Consequently, the proportion of tax income in total revenue increased to 24 per cent in 1988 and an estimated 31 per cent in 1989 from a mere 19 per cent in 1984-1987.

In addition to its efforts to restructure and broaden its revenue base, the Government of Viet Nam has also sought to reduce its budgetary deficit by restraining public expenditure in recent years. Extensive cuts in public sector employment and government subsidies were thus proposed in the 1988 budget, and these measures were reinforced in the following year by the introduction of wage structure and exchange rate reforms which resulted in the elimination of all consumer and export subsidies. In addition, budget transfers to State enterprises were sharply reduced, and an unprecedented imposition of fees for medical and educational services was effected in January and September 1989 respectively.

The combination of tight resource constraints and rising recurrent expenditures inevitably resulted in a reduced emphasis being placed on public sector capital spending during the 1980s. The share of development outlays in total expenditure thus declined steadily from 31 per cent in 1985 to 20 per cent in 1988. In 1989 the share of capital spending rose again to approximately 26 per cent, although this reflected a slow-down in the growth of recurrent expenditure as the measures to inhibit it gathered momentum rather than a substantial real increase in public sector investment.

Despite the recent efforts to increase the government's revenues and reduce its expenditures, a significant fiscal deficit, estimated at some 40 per cent of total expenditure in 1989, remains. Although a significant proportion of this deficit still continues to be financed by foreign loans and grants, principally from the CMEA countries, more than half of it is still covered by borrowing from the State bank with obvious consequences for inflation. With further spending cuts almost certain to be politically unacceptable as they would impinge on important areas of social expenditure, and with future inflows of budgetary assistance from the CMEA countries under serious threat, the expansion of the government's revenue base remains a major policy priority. Its urgency has been enhanced in the aftermath of the liberalizing reforms of the past few years by a growing tussle for available revenues between the central and local governments, many of which have drawn up extensive investment programmes outside the national economic plan.

In the light of these developments, which are complicating the drafting of the fourth five-year plan due to be introduced in January 1991, the June 1990 session of the National Assembly approved a number of tax reforms aimed at boosting the central government's revenues. This resulted in the adoption of new turnover,

"special consumption" and income taxes. The turnover tax applies to all types of formal economic activity, while the "special consumption" tax has been levied on six items regarded as luxuries (cigarettes, liquor, beer, firecrackers, playing cards and paper products used in ancestral rituals) and the income tax is to be applied to corporations as well as individuals engaged in commerce. Political sensitivities prevented the introduction of an amended agricultural tax, however, which was referred back to the Council of Ministers for further deliberation.

Monetary policy

Monetary policy has played only a comparatively minor part in the day-to-day management of the Vietnamese economy for most of the country's post-reunification history. Until 1988 the growth of monetary aggregates was determined principally by the need to cover the budgetary deficits and to meet the centrally planned physical output targets of the State enterprises, with cash and bank credits being issued in line with the liquidity requirements of these firms. During this period the Government of Viet Nam therefore pursued an essentially passive and accommodating monetary policy, and was unable to establish effective control over the growth of cash and credit.

Under the system in operation until 1988, the government's annual monetary targets were set down in credit and cash plans prepared by the State Bank of Viet Nam (SBV) in conjunction with the annual State economic plans prepared by the State Planning Committee (SPC). The credit plan was derived essentially through a summation of the credit requests of the individual State enterprises, co-operatives and, in a small number of cases, private individuals, as submitted by them to the various local branches of the SBV before the start of the planning year. The cash plan, meanwhile, which determined the volume of net cash injections or withdrawals planned for a particular year, was based on projections of cash absorption and injection in the economy for that year prepared by the SBV. In estimating the projected level of cash absorption in the economy, particular consideration was given to planned levels of State sales of goods and services and the expected level of savings mobilization. The estimated level of cash injection in the economy, on the other hand, was determined principally by the government's wage and salary payments, and by planned levels of procurement by State enterprises and co-operatives. Both the credit and the cash plan had to be approved by the Council of Ministers, and could be adjusted by the government in the light of changed circumstances.

A historical survey of the growth of principal monetary indicators in the 1980s is presented in Annex Table A-8. This shows an accelerating expansion of domestic credit, which rose by more than 300 per cent annually in the late 1980s as rising prices triggered an accommodating increase in the disbursement of credit. It also shows that the bulk of the credit was provided to State enterprises, which began increasingly to be used as a source of working capital following increases in wages and administered input prices as well as the introduction of government restrictions on the use of credits for fixed capital after 1987. On the other hand, however, the data in Annex Table A-8 fail to show the still considerable importance of United States dollars and gold in the Vietnamese monetary system, which were used as a hedge against inflation by private savers and in the conduct of cross-border trade. Gold was also employed for the purchase of durable goods and medium-term bonds issued by State enterprises.

The approach to monetary management employed by the Government of Viet Nam until 1988 had two particularly serious shortcomings. First, by being based on cash and credit plans derived as a result of upward aggregation from the microeconomic level, it took insufficient account of macroeconomic linkages and effects. Second, by being tied to the physical plans and providing for an almost automatic expansion of cash and credit volumes in response to rising prices and wages, it proved ineffectual in curbing inflation. The latter weakness became increasingly significant in the second half of the 1980s as inflationary pressures mounted, and forced the government to take a number of measures to redefine the goals and methods of its monetary policy.

In April 1988, the government consequently announced a major restructuring of the banking system, which allowed the SBV to transfer most of its retail banking activities to existing and newly established commercial banks. The reorganization of the SBV as a more orthodox central bank permitted it to impose more restrictive credit policies, and since the second quarter of 1989 limits have been imposed on the commercial banks' borrowings from the SBV and on the net domestic assets of the SBV, including quarterly ceilings on the SBV's net credits to the government. In March 1989, moreover, the SBV began to pursue a radically different interest rate policy, with deposit and lending rates no longer being held far below the inflation rate and the traditional differentiation of interest rates by purpose and borrower being abolished. A liberalization of the gold market since September 1988, which removed the official monopoly of the State on all gold

transactions, provided a further means for controlling domestic liquidity by enabling the State banks to buy or sell gold at market-determined prices.

The short-term impact of the recent monetary policy reforms of the Government of Viet Nam has been dramatic, with the hyperinflationary spiral of the late 1980s being broken and relative stability being restored within a period of a few months. The transition from a credit plan based mechanism to a more conventional form of monetary control is still far from complete, however, and credit planning continues to form the basis of monetary policy. The replacement of this system with a macroeconomically more appropriate system of monetary management will require not only the acquisition of expertise and experience by the SBV, but also the creation of an adequate infrastructure for the transmission and analysis of relevant information flows.

Labour policy

A highly unbalanced population structure has reinforced the predilection of the Government of Viet Nam for an interventionist role in the labour market, and forced it to adopt an active labour policy. Preliminary results of the 1989 census thus show that Viet Nam's population has remained predominantly rural, with only about 20 per cent of the total population of 64.4 million living in urban areas with more than 5,000 residents. These data reveal further that the four major urban centres of Ho Chi Minh City, Hanoi, Haiphong and Danang accounted for about 40 per cent of the total urban population, and that rural population densities varied from less than 50 persons per sq km in the upland provinces of Lai Chau, Son La, Gia Lai-Kontum and Dac Lac to almost 1,000 per sq km in the more heavily populated rural areas of the Red River delta. The age distribution of the population is also very uneven, with the latest available disaggregated data indicating that almost 40 per cent of the 1989 population were less than 15 years old.

In order to overcome the constraints to economic development imposed by the uneven regional population distribution, the Government of Viet Nam has initiated the establishment of "New Economic Zones" (NEZs) in the relatively underpopulated and uncultivated parts of the country, with considerable official encouragement being given to townspeople and residents of the more densely populated rural areas to migrate to these economic frontier areas. These measures appear to have had a considerable degree of success, with official estimates suggesting that more than 3.5 million people have been resettled in the NEZs since the reunification of Viet Nam. In order to overcome some of the lingering unpopularity of this resettlement programme, and in particular the reluctance of the Vietnamese to be separated from their relatives and acquaintances, the government has now begun to encourage the relocation of entire village communities.

The imbalance in the Vietnamese population's age distribution poses a further problem, with its relative youthfulness ensuring a high rate of labour force growth and an attendant need to generate a correspondingly rapid increase in employment opportunities. Official labour force data reproduced in Annex Table A-4 thus indicate an average growth rate of approximately 2.9 per cent per annum for the employed work force between 1984 and 1988. This substantially exceeds the estimated overall rate of population growth of approximately 2.1 per cent during the same period. A sharp drop in the number of employed workers in 1989 reduces the average annual growth rate for 1984-1989 to about 1.9 per cent, however.

The data in Annex Table A-4 are widely believed to understate the actual rate of labour force growth, moreover, since they probably underestimate the full rate of labour absorption by the private sector and only take domestically employed workers into account, thus ignoring the unemployed members of the labour force and those obtaining employment outside Viet Nam. According to one recent estimate, the total employed labour force amounted to 32.6 million in 1988 rather than the recorded level of 28.9 million indicated in Annex Table A-4. The same source also suggests that some 150,000 new job seekers per year are likely to have obtained inadequate employment, while a further 60,000 are likely to have become unemployed.[2/]

One measure adopted by the Government of Viet Nam to alleviate the problem of absorbing the rapid growth in the country's labour force has been the organized dispatch of Vietnamese manpower overseas. This programme, which is operated under the auspices of the Ministry of Labour, has the additional benefits of generating foreign exchange flows and providing opportunities for the acquisition of technical and managerial skills. During the 1980s some 220,000 Vietnamese workers, representing about 3 per cent of the new entrants to the labour force, were sent abroad under this scheme. Of these, 210,000 went to Viet Nam's partner countries in the CMEA (principally the USSR, the German Democratic Republic, Bulgaria and Czechoslovakia) and the remainder to African and Middle Eastern countries (principally Algeria, Iraq and Libya).

Though large, the total number of Vietnamese expatriate workers falls well short of the numbers achieved by other Asian labour exporting countries, and a significantly increased outflow is likely to be hampered in the short term both by the unavailability of an adequate infrastructure and the uncertainties arising from the recent political developments in the main Eastern European markets for Vietnamese manpower. Indeed, several countries of eastern Europe have sought in the past few months to terminate their labour agreements with Viet Nam and arrange an accelerated repatriation of up to 200,000 Vietnamese workers. The return of these workers will inevitably raise social and economic tensions within Viet Nam and impose increased demands for domestic job creation. The ranks of the un- and underemployed are expected to be swelled further by as many as 300,000 people in the coming years, moreover, as a result of the anticipated demobilization of Vietnamese military forces returning from Laos and Cambodia. The level of unemployment is estimated at 5 per cent of the work force.

For the foreseeable future, therefore, the vast bulk of the annual increases in the Vietnamese labour force will continue to have to be absorbed in the domestic economy. As indicated in Annex Table A-4, approximately 900,000 new jobs per year are recorded to have been created within Viet Nam between 1984 and 1988. By far the largest proportion of these were generated in the co-operative sector, even though the data in Annex Table A-4 overstate the contribution of this sector because they have not been corrected for the distorting effect of the accelerated co-operativization of private enterprise in southern Viet Nam in the years to 1985. By contrast, employment in the State sector expanded only very modestly during 1984-1988, largely as a result of budgetary constraints and the deliberate adoption of policies aimed at reducing the number of public employees within both the administration and the State enterprises. During 1989 employment contracted as the government laid off nearly half a million workers from State-run companies. Employment levels in the private sector, meanwhile, have stagnated in the post-1985 period after suffering a severe contraction in earlier years as a result of the enforced co-operativization in the south of the country.

A breakdown by industrial origin of the data in Annex Table A-4 indicates that agriculture is the most important source of employment in Viet Nam, and each year between 1984 and 1988 has absorbed almost 500,000 new entrants to the labour force. In this context, the opening up of the NEZs has made a significant contribution, and provided an estimated 125,000 new jobs per year. Job creation in the State-dominated sectors, including construction, industry, trade and public service, has been very modest in the latter half of the 1980s owing to the fiscal constraints faced by the government. As a result of the government's accelerating withdrawal from the corporate sphere and the increased entry of private capital into areas previously monopolized by State enterprises, however, these sectors are expected to become progressively less vulnerable to budgetary pressures in the coming years. This will permit an expansion not only of the number of firms and the volume of their output, but also of their employment of labour.

Trade policy

Viet Nam's external trade has traditionally been subject to a wide range of regulations and controls in keeping with the centrally planned system of economic management adopted by the country's government. Under this system, an official trade plan encompassing the bulk of the country's projected trade flows was formulated as part of the overall economic planning process, with volume targets being set for exports and imports to and from the non-convertible and convertible areas. Much of this trade was conducted under barter or countertrade arrangements of one form or another, and trade prices for merchandise flows within the non-convertible area were frequently agreed on a bilateral basis between the trading partners concerned with no direct reference to prevailing international market prices.

The implementation of the trade plan was assigned to a number of specialized State trading corporations under the control of the central government, which were required to export and import the agreed volumes of products at the agreed prices. Where the agreed export prices were insufficient to cover domestic procurement costs, subsidies were available from the Export Support Fund. Priority was also generally given to the development of trading links within the non-convertible area, with the State trading corporations only being permitted to trade with the convertible area once they had met the targets set for the non-convertible area.

Settlements with the CMEA countries were made either through bilateral clearing accounts or through the transferable ruble settlement system, which also provided for the granting of short-term credit facilities from the International Bank for Economic Co-operation (IBEC) for up to 2 per cent of the value of Viet Nam's transactions with the CMEA bloc. Settlements with the convertible area, meanwhile, were made mainly in United States dollars. In both cases, however, a complex system of multiple exchange rates was employed

depending upon the nature of the transaction, with price adjustments being offered to counter the effects of unrealistic exchange rates.

As Viet Nam's highly overvalued currency necessitated the granting of increasingly large export subsidies and shortfalls in domestic production constrained the country's ability to meet its export targets, this system came under increasing strain. In the early 1980s it was therefore modified to include a large number of newly established foreign trade corporations under the jurisdiction of provincial and municipal authorities, which were intended primarily to trade with the convertible area at market-related prices and exchange rates, and were also permitted to retain a proportion of their foreign exchange earnings to finance their own imports. By the end of the decade more than 80 such enterprises had been established, especially in Ho Chi Minh City.

As part of the more thoroughgoing process of economic reform initiated from 1987-88 onwards, the Government of Viet Nam has also introduced several adjustments to its traditional trade policy during recent years. In a measure aimed primarily at improving its fiscal balance, it imposed a variety of new taxes on international trade in early 1988. These included both export taxes, which were levied at rates seldom exceeding 10 per cent, and import duties, which ranged from 5 per cent to 55 per cent, with the lowest rates being levied on imports of capital and intermediate goods, and the highest on imports of consumer goods classified as luxuries.

In February 1988 the regulations governing foreign travel were eased, with a limited degree of private foreign travel having being permitted, especially for reasons of health, education and visiting relatives. In the case of such family visits, however, the costs must be met by the relatives being visited. Beyond this modest liberalization of travel restrictions, however, non-merchandise trade remains closely regulated. All transactions on invisible account thus require individual authorization by the Vietnamese authorities, which provide reasonable volumes of foreign exchange for such transactions on a case by case basis. All travel abroad, including both official business travel and private travel, also still requires the authorization of the prime minister's cabinet.

A particularly important policy shift aimed at improving Viet Nam's trade performance was introduced in early 1989. This involved a rationalization of the complex system of multiple exchange rates employed in the conduct of the country's trade with the convertible area as well as a sharp devaluation of the dong, which brought its official exchange rate broadly into line with the rate prevailing in the free market. The combined effect of these changes was to stimulate a substantial expansion of Viet Nam's external trading links from mid-1989 onwards.

As recent developments in eastern Europe have resulted in a disruption of Viet Nam's long established trading patterns in 1990, however, its trade prospects have been placed in considerable jeopardy. Confronted with this danger, the government has taken a number of measures to promote exports and diversify Viet Nam's trading links. These measures, which as noted in Chapter I have included a further substantial devaluation of the dong, should enable the country to withstand the shocks generated by the collapse of its existing trading relations, and to replace them with more robust market-based trade patterns.

The highly regulated foreign trade system adopted by the socialist rulers of Viet Nam has almost inevitably spawned an extremely active black market, which operated at both the internal and external level and remains an important feature of the Vietnamese economy to this day. One recent study has thus estimated that as much as 40 per cent of the country's total economy "exists under the table" while also pointing out that "the end of the black market - especially for quality consumer goods - is nowhere in sight".[3/] Even senior civil servants are reported to be involved in such unofficial trade, which is flourishing throughout the country but especially in the south.

The most visible manifestation of this black market has long been the widespread availability, especially in southern Viet Nam, of an extensive range of smuggled consumer goods. This smuggling is officially described as having reached epidemic proportions since the opening of Viet Nam's borders with China and Cambodia two years ago, with government spokesmen claiming that at least 60-65 per cent of all goods on sale in the major cities in the first half of 1990 consisted of contraband. Concerned about the vast outflows of foreign exchange and gold to finance these illegal imports, the government launched a firm crackdown against smuggling in the second half of 1990, with all security agencies, four ministries, and local People's Committees being activated into a co-ordinated campaign against the problem.

Despite the recent efforts of the Government of Viet Nam to encourage increased trade and financial flows between Viet Nam and the outside world, the country's reintegration into the international economy remains constrained by the continued absence of formal ties with the United States and the persistence of United States economic sanctions. These restrictions, which are imposed under a variety of United States laws - including the Trading with the Enemy Act (TWEA) of 1917 as amended by the International Emergency Economic Powers Act (IEEPA), the Export Administration Act of 1979 and the Omnibus Trade and Competitiveness Act of 1988 - strictly prohibit all individuals or corporations subject to United States jurisdiction from entering into any direct or indirect commercial dealings with Viet Nam.

Apart from preventing the development of normal economic relations between the United States and Viet Nam, these measures have also resulted in Viet Nam suffering a high degree of ostracism in the broader international arena. Initial hopes that the United States sanctions would be lifted following the withdrawal of Vietnamese forces from Cambodia, which had long been the stated United States condition for a normalization of United States-Vietnamese relations, have not been fulfilled as the Government of the United States has introduced a series of other conditions. Both economic and political considerations may cause an improvement in United States-Vietnamese relations, however, and hence an easing of United States sanctions, in the not too distant future. The United States business community is already showing signs of concern over the prospect of being excluded from a potentially rapidly developing market as a result of these restraints, and the accelerating improvement in East-West political relations as well as the increasingly important United States policy objective of preventing a return to power by the Khmers Rouges in Cambodia also augur well for the re-establishment of diplomatic and other ties between the two countries.

B. INDUSTRIAL POLICY

The Vietnamese authorities have traditionally placed considerable emphasis on the country's industrial development. In line with its socialist orientation and outlook, the government of North Viet Nam adopted at a very early stage the Soviet model of centrally planned and State implemented industrialization. Within this framework, annual production targets were set by the planning authorities for a wide range of industries, and a number of official agencies were charged with the task of providing the predominantly State-owned industrial enterprises with the necessary inputs and facilities to meet these targets. In setting their targets, the planners gave priority to the establishment of a heavy industrial base, which resulted in the adoption of an essentially import-substituting industrialization strategy.

This strategy formed the basis of the first five-year plan adopted by the Government of North Viet Nam in 1961, and remained a pre-eminent feature of its industrial policy in subsequent years. In 1975-76, following the defeat of South Viet Nam and the unification of the country, it was extended to the south, where industrial development had previously been focused primarily on the establishment of privately-owned manufacturing facilities for light consumer goods. The First National Plan for the unified country, which was launched in 1976, consequently continued to place high priority on the expansion of heavy industrial production with the eventual aim of achieving self-sufficiency in this area.

In practice, however, this policy proved difficult to sustain. Inadequate financial and technological resources, exacerbated by the continuing imposition of United States sanctions which the Government of Viet Nam had expected would be lifted during the plan period, resulted in input shortages, high costs, and low output quality as well as a significant underutilization of installed capacity. The achieved annual average rate of industrial output growth of 0.6 per cent thus fell far short of the targeted rate of 16-18 per cent per annum, with the failure of the plan being reinforced by the fact that the overwhelming priority given to the production of capital goods resulted in severe shortages of consumer and intermediate goods.

Faced with this serious underachievement of plan targets, the Vietnamese leadership initiated a comprehensive review of its industrial policy in 1981-82. In 1981, the government introduced a "triple plan" system for State-owned enterprises aimed at raising their capacity utilization levels. Under this scheme, State enterprises were subjected to the strictures of three interlocking plans, with the overall State economic plan being designated as Plan A and two further plans, B and C, being adopted as subsidiary plans aimed at ensuring high levels of capacity utilization. Of these, Plan B involved an attempt to stimulate additional production on the part of the State enterprises by encouraging them to acquire additional inputs by their own efforts, while Plan C involved the mobilization of State enterprise employees to utilize the facilities of the enterprise to produce yet more additional output on their own account. While the output produced under Plan A had to be sold to the State procurement agencies, the output produced under Plans B and C could also be sold on the free market.

The introduction of this "triple plan" mechanism was followed in 1982 by the adoption of "new economic orientations" by the Vietnamese leadership at the Vth Party Congress. These were based on a recognition of the high degree of resource misallocation that had been generated by the earlier industrialization policies, and thus involved a shift in emphasis from heavy to light industries and from a predominantly import-substituting industrialization strategy to a more balanced approach placing increased stress on the establishment of an export-oriented manufacturing capacity. These shifts in industrial orientation were accompanied by a partial deregulation of the industrial sector, which resulted in the State-owned enterprises being granted and increased degree of autonomy, especially with regard to the procurement of imported inputs and the development of export markets, and the role of private enterprise in the industrial sector being enhanced.

These revised policies were put to test in the Second National Plan launched in 1981, which achieved an average annual industrial output growth of 9.5 per cent, well in excess of the plan's targets. Equally significantly, the bulk of this growth was generated by small- and medium-scale enterprises, many of which were in the private sector. Despite their relatively high degree of success in achieving the aims set for them, however, the ideologically suspect nature of these new policies meant that they were accepted only grudgingly by the more conservative members of the Vietnamese leadership, who were particularly incensed by the increased level of economic decision making power delegated to the individual State enterprises and their workers as a result of the 1981-82 reforms.

In 1982-83, as the economic situation improved and the growth in national income and output began to accelerate again, these more orthodox elements were able to expand their influence and achieve a partial reversal of the reform process. Under their pressure, the government was temporarily forced to restore an increased level of central planning and to reimpose some of the restrictions on private sector activity that it had lifted in the preceding few years. By the end of the Second National Plan in 1985, however, it became abundantly clear that whatever output growth had been achieved during the plan period had been due to the impact of the reforms of 1981-82, and that the partial return to orthodoxy in later years had only had a retarding influence on this growth.

A dispassionate analysis of the weaknesses of industrial policy and performance in Viet Nam during the first ten years after reunification is contained in a recent report by the State Planning Committee of Viet Nam and the United Nations Development Programme, and describes this period as a decade of "instability and ineffectiveness".[4/] It points out further that State-owned enterprises were estimated to have utilized only 40-50 per cent of available capacity during this period, largely because of shortages of energy and raw materials and the inadequacy of Viet Nam's transport and communications infrastructure, and that the equipment and production technologies employed by these enterprises was outdated and the quality of their output low. It goes on to note that the Government of Viet Nam identified the following principal causes for the less than entirely satisfactory performance of the industrial sector:

- Investment had been scattered over too many projects in an uncoordinated manner, and a number of these projects had been subject to construction delays or been left unfinished.

- The planners had failed to anticipate fully the lack of capital resources and the inadequate availability of raw materials (especially imported inputs) and energy supplies.

- Export-oriented activities had not been given the high priority they deserved.

- The State enterprises had engaged in only a limited degree of specialization and trade, with most of them being vertically integrated but showing little sign of horizontal integration.

- The application of science and technology in industry had been weak, and only a limited degree of technological progress had been achieved.

- Excessive bureaucratic centralization had restrained initiative and creativity among the industrial work force, and the output of the State-owned enterprises was insufficiently competitive on international markets in terms of both quality and prices.

Acting upon these findings, the Vietnamese authorities conducted a thorough re-appraisal of their economic policies in general and their industrial policy in particular, and in December 1986 the sixth Party Congress initiated the process of *doi moi* (renewal or renovation) and approved a series of important economic

reforms. One of the principal effects of these reforms was a significant liberalization of the industrial policy of the Government of Viet Nam, with direct government controls over most State enterprises being removed. Only in the case of 35 "key" industrial sectors, which included coal, electricity, steel, chemicals, fertilizer, transport and communications and a number of light industrial projects did the government retain some measure of direct control in the day-to-day management of State enterprises. All others were declared free to recruit and remunerate workers, procure raw materials, attract capital through borrowing and investment, and market their own output. The State only retained the right to receive tax payments and profit repatriations, which were calculated by comparing their allowable costs with the value of their sales. Loss making firms, it was decided, would either be shut down or transferred to some other form of ownership.

This process of industrial liberalization was sustained in the following years. In December 1987 the Council of Ministers issued a decree (No 217), which granted greater independence to all manufacturing enterprises, including the producers of the 35 strategic items, and ended direct State involvement in the management of their production and distribution. In addition, controls on the holding of foreign exchange by industrial enterprises were also relaxed, and they were granted direct access to foreign markets. The impact of these measures was reinforced by a series of subsequent deregulatory policies, involving in particular a virtual abandonment of the complex system of State administered prices. This resulted in the effective demise of the "triple plan" system introduced in 1981 as the almost universal adoption of market based prices displaced the differential input pricing mechanism on which the system was based.

C. FOREIGN INVESTMENT POLICY

Whilst adopting these reforms the government also recognized the important contribution that direct foreign investment could make to Viet Nam's industrialization by attracting foreign funds, technology, expertise and export markets. In a major departure from previous policy it therefore drafted a new law on foreign investment, which was approved by the National Assembly on December 29, 1987, and promulgated by the Council of State on January 8, 1988. In the context of this law, which is reproduced in full in Annex B.1, the government designated several fields of activity as being particularly suitable for foreign participation. These included:

- Import substituting and export promoting activities contained in major economic development programmes.
- High technology industries using skilled labour and raising the output of existing industries.
- Labour-intensive industries employing local labour, raw materials and other resources.
- Infrastructural projects.
- Service sector activities capable of generating foreign exchange, such as tourism, ship repair, air transport, and airport and seaport services.

Although the government has sought to promote foreign investment in these priority sectors in particular, it does not discourage such investment elsewhere in the economy, and all sectors of the economy are formally open to foreign investors. The new law on foreign investment distinguishes between three forms of such investment: contractual or co-operative arrangements between foreign and Vietnamese firms, incorporated joint ventures with foreign equity participation, and wholly foreign-owned enterprises. In the case of joint ventures this law imposes no limit on the maximum shareholding of the foreign partner but does specify a minimum shareholding of 30 per cent. The capital contribution of the foreign partner may take the form of foreign exchange, technology and patents, fixed plant and equipment, and spare parts, while the domestic partner's contribution may be provided in the form of local currency funds, buildings and fittings, plant and equipment, rights to land and other natural resources, and services. Under the original terms of the foreign investment law, however, the participation in joint venture enterprises was limited to State-owned domestic firms and co-operatives.

Licences granted to joint venture projects under the foreign investment law have an initial validity of 20 years, but may be extended. In addition, the foreign investment law guarantees the fair and equitable treatment of foreign investors, with Article 21 prohibiting the expropriation or nationalization of invested capital, property and foreign assets of foreign corporations or private persons investing in Viet Nam. Foreign investors are also assured the right to remit abroad their share of corporate profits and any other earnings

arising from their business operations. At the same time, however, foreign investment enterprises are not permitted to reduce their approved capital base during the course of their operations. They are also required to retain some funds in Viet Nam through an obligation to allocate at least 5 per cent of their annual profits to establish a reserve fund, which may not exceed 25 per cent of the approved capital of their enterprise.

With the exception of investments in the extraction of oil, natural gas and other valuable natural resources, where higher rates may be levied, the rate of corporate income tax is restricted by the investment law to a range of 15-25 per cent. In addition, the Government of Viet Nam is authorized to grant tax holidays and waivers on export and import duty at its own discretion. In specific cases, foreign joint ventures may thus be exempted from the payment of corporate income tax for up to two years after their first profit making year, and may be granted a fifty per cent reduction of corporate income tax for a further period of two years. In assessing their tax liability, foreign investment projects may also carry forward losses and set them off against profits for up to five years.

The investment law also makes no unreasonable demands with regard to the staffing of enterprises established with the participation of external investment funds. The composition of the board of directors of a joint venture must reflect the relative shareholdings of the local and foreign partners, and major policy decisions must be approved unanimously by the board. In the case of joint ventures, the post of general manager may be held by a foreigner, although at least one of the deputy general managers must be a Vietnamese. In the case of wholly foreign-owned firms, the entire management may consist of foreigners as long as they conduct their operations in accordance with Vietnamese law. Although enterprises established under the foreign investment law must give preference to local managers and workers in their staffing decisions, expatriates may be employed if qualified Vietnamese cannot be recruited. In general terms, foreign invested companies are also given a relatively free hand in dismissing employees whose work is unacceptable.

Article 36 of the foreign investment law provides for the establishment of an official agency to administer the approval and execution of foreign investment. This provision was reinforced by an implementing decree (No 139) issued by the Council of Ministers on September 5, 1988, to regulate in detail the execution of the foreign investment law, which stipulated the creation of a State Committee for Co-operation and Investment (SCCI) for the purpose of managing and administering all direct foreign investment in Viet Nam. The establishment of this body was ratified by the Council of Ministers in March 1989, and it commenced operations in June of that year.

The SCCI is conceived as an inter-ministerial body responsible for co-ordinating the activities of all the various official agencies involved in promoting, approving, facilitating and implementing foreign investment. It therefore brings together representatives of the Ministry of Finance, the State Bank, the Ministry of Commerce, the State Commission for Science and the State Planning Committee. It represents the final decision making body in approving and rejecting foreign investment proposals, and consists largely of lawyers and industry specialists, whose principal functions may be summarized as follows:

- To provide guidance and assistance for foreign and Vietnamese firms engaged in the negotiation of joint venture and co-operation contracts, and for foreign firms wishing to establish wholly foreign-owned enterprises in Viet Nam.

- To provide foreign investors with an understanding of Vietnamese laws and regulations, and to help foreign investors overcome any problems that they may encounter.

- To examine, evaluate and approve foreign investment proposals involving both joint ventures with domestic corporations and wholly foreign-owned enterprises.

- To determine investment priorities, and to grant preferential conditions to foreign investment projects in favoured sectors.

- To monitor and supervise the operations of enterprises involving foreign capital investment.

- To analyse the economic consequences of direct foreign investment.

Its many attractive features notwithstanding, the foreign investment law of 1987 as originally promulgated also left a number of critical issues unresolved. The regulations governing labour relations in the foreign

investment law constituted a particular area of uncertainty, and were highlighted in a recent report compiled by the State Planning Committee of Viet Nam and the United Nations Development Programme, which stresses their potential to "cause problems for foreign investors".[5/] One of the most important of these is the continuing direct and indirect pressure exerted by labour administrators to influence the recruitment policies of foreign investment firms in favour of politically acceptable rather than technically qualified personnel. In addition, the report points out that the labour regulations associated with the investment law fail to set adequate standards regarding working conditions in foreign investment enterprises. In particular, it argues that issues such as working hours, probationary periods, holidays, social and welfare matters and the conduct of labour disputes should be centrally regulated rather than being left to collective negotiations between the workers and management of individual firms.

Recognizing the remaining weaknesses of the foreign investment law of 1987 and its associated implementing decree of September 1988, the government has introduced several further laws and regulations concerning foreign investment in subsequent years. One set of such measures requires all firms operating in Viet Nam to pay all locally incurred costs (including fees, taxes and deposits) in hard currency, and stipulates that all wages and salaries paid to locally engaged staff must be "derived from foreign exchange". It therefore implies the need for potential investors either to be export oriented or import foreign exchange to pay their staff.

Another set of no less than 15 amendments to the terms of the original law was also introduced at the June 1990 session of the National Assembly. *Inter alia*, this allows private Vietnamese firms to enter into joint venture arrangements with foreign investors in a wide variety of economic sectors, and also permits more than one foreign firm to participate in a single joint venture project. In addition, it provides for additional tax incentives to be granted to foreign investors prepared to locate their Vietnamese enterprises in remote, underdeveloped or thinly populated areas.

Partly in response to the issues raised in the above discussion of the labour and employment regulations contained in the foreign investment law, the Council of Ministers issued a new statute in August 1990 governing the employment of labour by enterprises with foreign invested capital. This regulation permits such firms to recruit their labour from any part of Viet Nam. It does not, however, address one of the main complaints of foreign businesses, that they have to hire labour through government operated labour supply agencies and service companies at salaries exceeding the prevailing market rates, with a substantial proportion of these earnings being retained by the government.

Firm measures have been taken by the Government of Viet Nam to provide protection for intellectual property rights, however. It has thus secured Viet Nam's entry into the World Intellectual Property Organization (WIPO), and in January 1989 issued a decree on the protection of industrial property rights. This decree supplements and updates a number of existing ordinances on technology transfer and intellectual property, most of which were themselves introduced in 1988 and between them provide a reasonably comprehensive regulatory structure for the protection of intellectual property rights. In addition, the government has also licensed the activities of the Bureau for the Promotion and Development of Intellectual Property Activities (Investip), a privately-owned consultancy firm providing legal and technological assistance to private investors on matters pertaining to technology transfer and the licensing of patents and trademarks.

The establishment of this relatively favourable investment environment has yielded impressive results. According to a report presented to a session of the National Assembly in mid-June 1990, approximately 105 foreign investment projects worth more than $852 million had been approved in 1988 and 1989. By the beginning of September 1990 the number of approved investment projects had been increased to 183, and their overall value to $1.83 billion. A particularly significant development in this context is a resurgence of Japanese trade and investment interest, with several major conglomerates having opened offices in Hanoi and Ho Chi Minh City during 1990. The total value of Japanese direct investment projects was cited at $71 million in mid-May 1990.

Though remarkable, the recorded increase in foreign investment interest during the past two and a half years is widely believed to fall short of Viet Nam's true potential. In part, this is due to the continuing sanctions being imposed by the United States against the country, which in addition to the trade restrictions discussed earlier also include an effective ban on direct investment through the operation of the Foreign Assets Control Regulations (FACR) authorized under the Trading with the Enemy Act (TWEA) of 1917 and the Export Administration Act of 1979. To perhaps an even greater extent, however, this failure by Viet Nam to realize its true potential in attracting foreign investment may be ascribed to the persistence of a number of

institutional and regulatory impediments to the smooth absorption of foreign investment funds and the implementation of foreign investment projects.

The most important of the outstanding issues still needing to be tackled by Vietnamese policy makers include an inadequate access to funds, both domestic and foreign, to finance not merely the desired levels of investment but even the required levels of working capital. Restrictions imposed by the government on the availability of foreign exchange exert a particularly severe constraining effect on a number of firms, and especially those which supply the domestic market only and therefore do not generate any foreign currency earnings of their own. The impact of these restrictions is exacerbated by the limited availability of domestically generated investment funds, especially for privately-owned enterprises. The creation of a suitable financial infrastructure, comprising at the very least a reasonably well developed commercial banking network and at best an efficiently functioning capital market as well, is therefore an important prerequisite for a more rapid growth of investment interest.

A rapid expansion of private investment interest in Viet Nam is also hampered by the lack of a suitable transport, communications, travel and hotel infrastructure. The poor state of many of the country's roads, hotels and telecommunication facilities is widely recognized as having an inhibiting effect on the inflow of foreign investment funds, even among its economic planners themselves. The deterrent effect on foreign investors of these infrastructural constraints is heightened, moreover, by difficulties in obtaining modern equipment and spare parts, and by a general inadequacy of staff with appropriate technical expertise, as well as a lack of cost and quality consciousness among employees. Especially in the State-owned enterprises there is also a considerable degree of managerial weakness, with the officials charged with operating these enterprises frequently having only limited business skills. Other problems believed to be inhibiting private investment include relatively high local cost structures and difficulties in establishing an adequate quality control regime, as well as insufficient vertical and horizontal linkages in the Vietnamese economy, which limit the scope for the establishment of processing industries based on Viet Nam's generous endowment of natural resources.

While several of these weaknesses will inevitably take a considerable amount of time and effort to overcome, there is little doubt that the Government of Viet Nam is aware of the need to mitigate their effects if an increase in the volume of direct investment are to be achieved and sustained. Several further reform measures aimed at improving the operating environment for foreign invested enterprises and joint ventures are therefore reported to be in various stages of preparation. According to a Ministry of Justice spokesman cited in a recently published report,[6/] foreign direct investment will eventually be regulated by more than 20 separate laws, of which twelve have already been approved and the remainder are currently being drafted.

The release of one set of such regulations, which was originally scheduled to be introduced by the end of 1989, is now said to be imminent. It is expected to cover the issues of technology transfer, the establishment of representative offices in Viet Nam by foreign firms, the residence and tax liability of foreign investors in Viet Nam, and customs and foreign exchange procedures pertaining to foreign investors. A further set of regulations, which was originally scheduled to be issued by June 1990 and is currently being drafted, is expected to cover the pricing of natural resources, public utilities and land. Additional laws on oil and gas exploration, domestic investments, and the establishment and operation of Export Processing Zones (EPZs) are also reported to be under consideration. In addition, the government also intends to pass a series of company, banking and commercial laws, as well as a law regulating landlord-tenant relationships, and three tax laws governing agricultural benefits (profits) and a special sales tax. An extension of income tax to cover workers in State- and privately-owned firms (including foreign investment enterprises) and the imposition of a natural resources tax is also proposed. Finally, a comprehensive Civil Code, involving a full range of laws covering all issues, including banking, contracts, intellectual property, labour, land, property, etc. is due to be introduced by 1995.

NOTES TO CHAPTER II

1/ Socialist Republic of Viet Nam, State Planning Committee and United Nations Development Programme, *Report on the Economy of Vietnam*, January 1990, page 46.

2/ *Ibid*, pages 40-42.

3/ Christopher F. Bruton and Mathilde L. Genovese, Vietnam: An Investor's Appraisal, *Business International Asia-Pacific*, Hong Kong, June 1990, pages 42-43.

4/ Socialist Republic of Viet Nam, State Planning Committee and United Nations Development Programme, *Report on the Economy of Vietnam*, January 1990, pages 130-131.

5/ *Ibid*, page 138.

6/ Christopher F. Bruton and Mathilde L. Genovese, Vietnam: An Investor's Appraisal, *Business International Asia-Pacific*, Hong Kong, June 1990, page 71.

Fig.I. Distribution of Gross material product, (GMP), 1983 and 1989, (Percentage, GDP = 84.7 % of GMP)

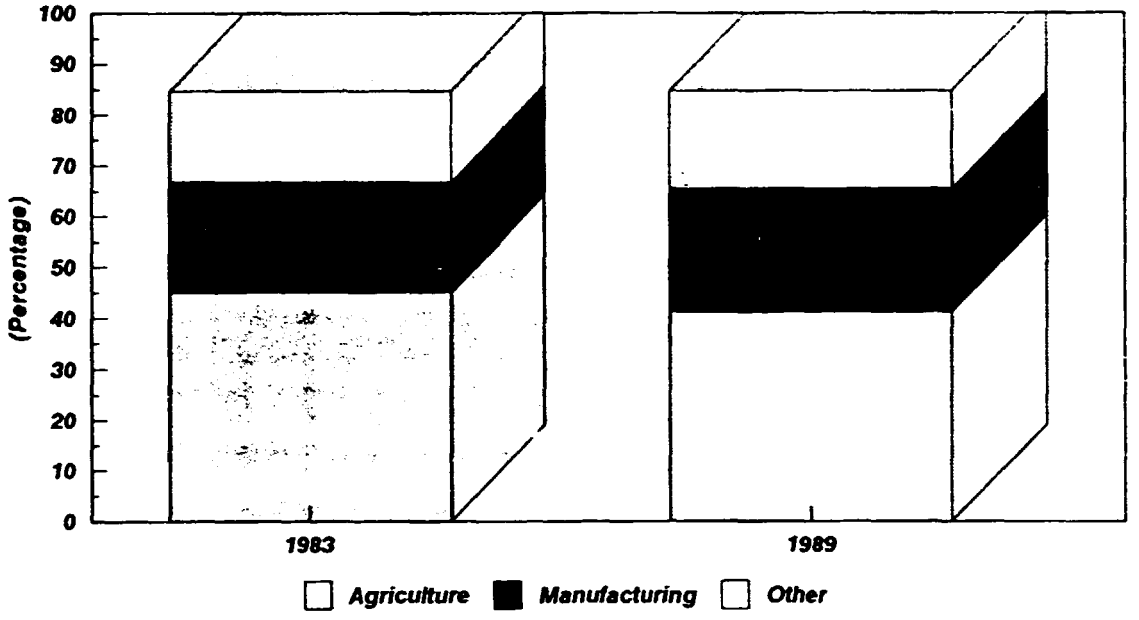


Fig.II. Growth of GDP and gross material product (GMP) in industry, 1984 - 1989 (Percentage)

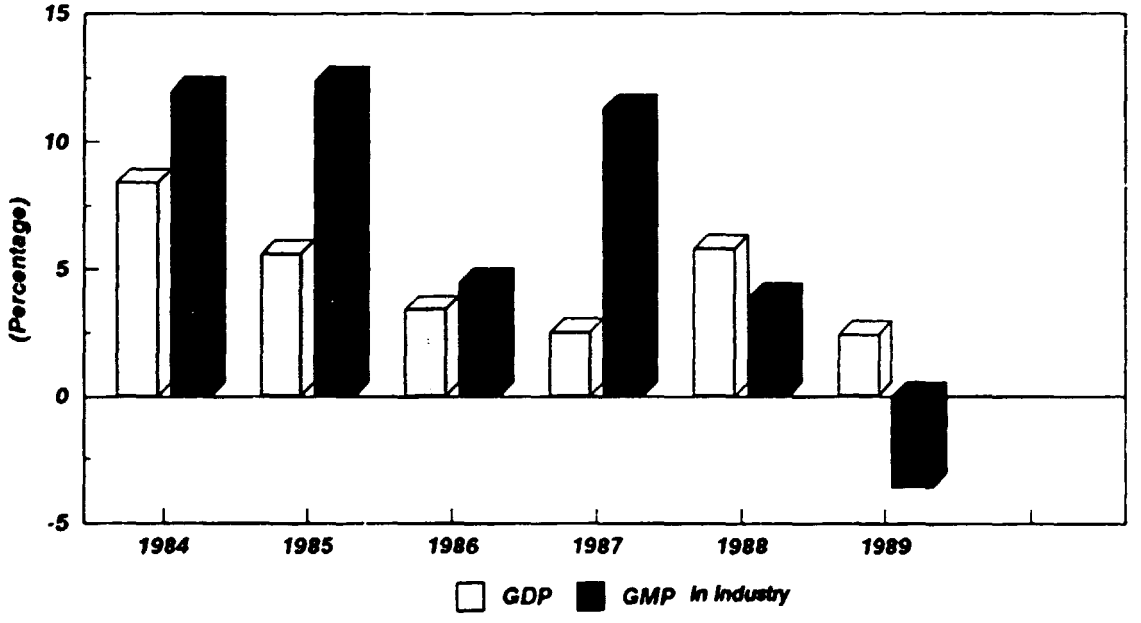


Fig.III. General Price Index, 1983 - 1989
(Annual percentage change)

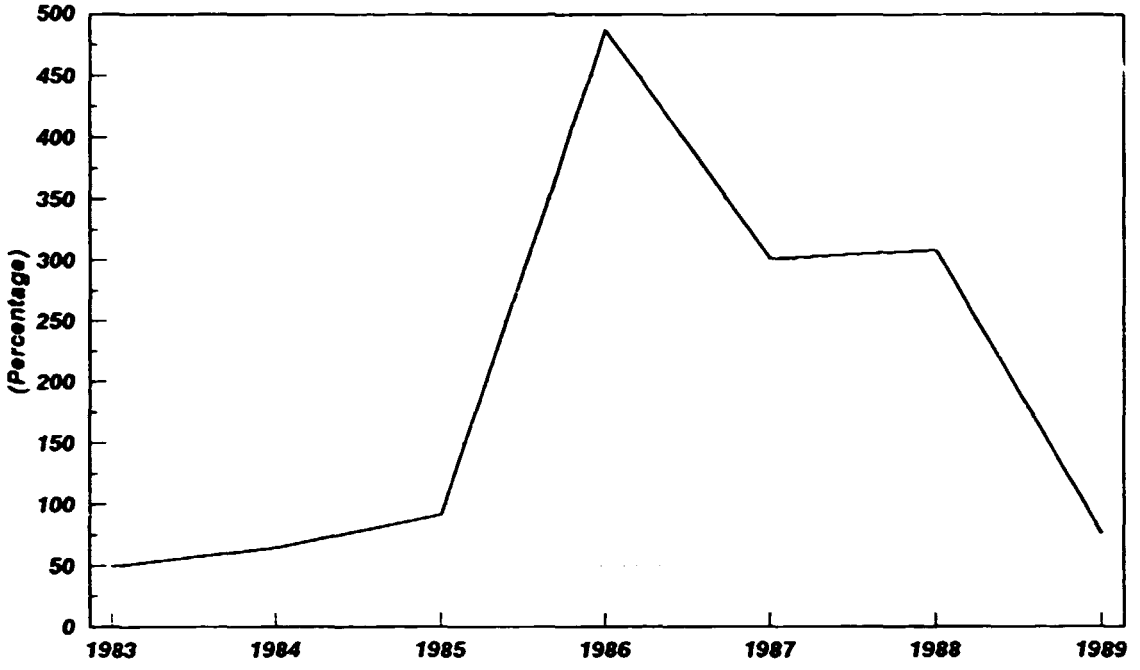


Fig.IV. Exchange rates, 1983 - 1989
(Annual average, dong per US$)

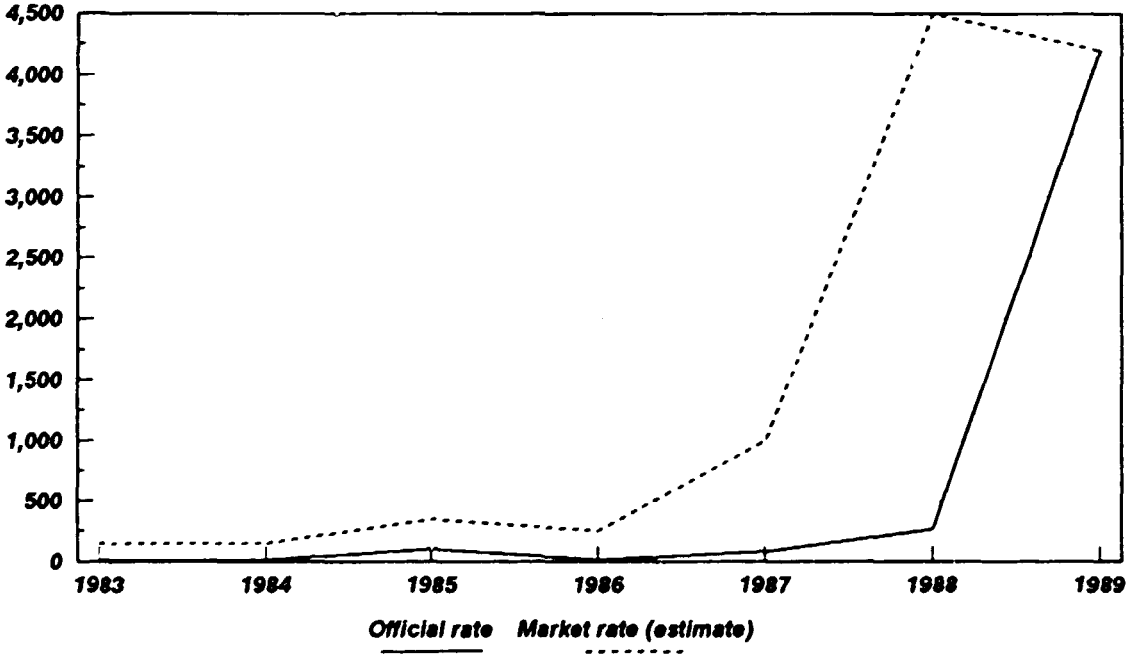


Fig. V. Trade balance, 1989, convertible area

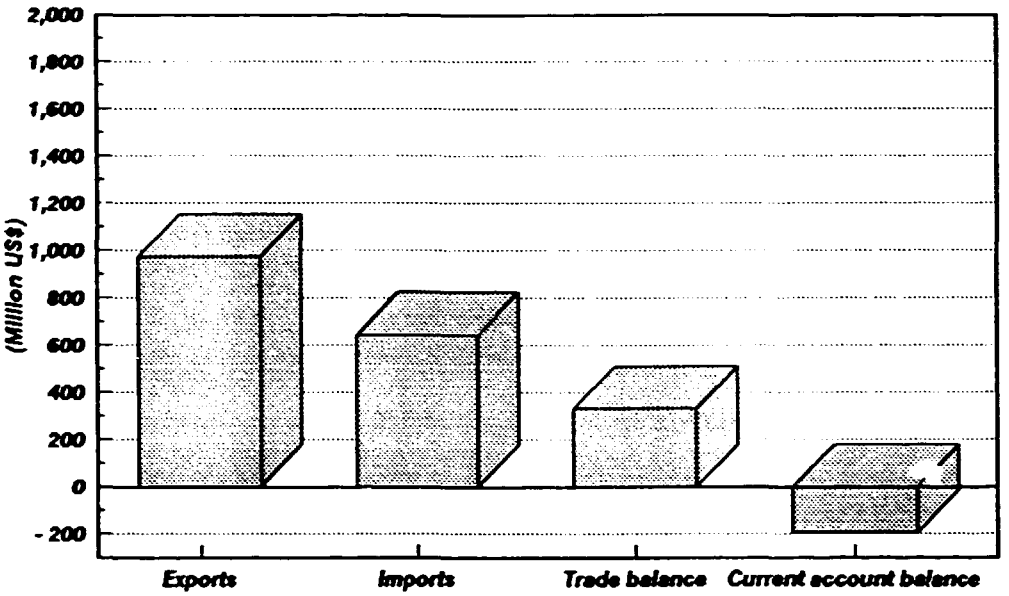


Fig.V.A. Trade balance, 1989, non-convertible area

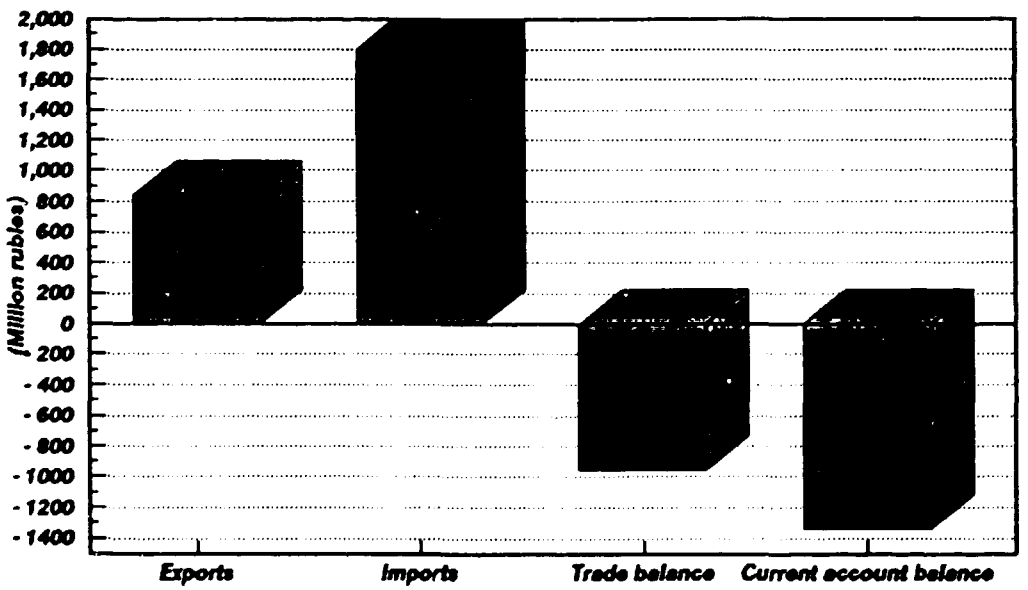
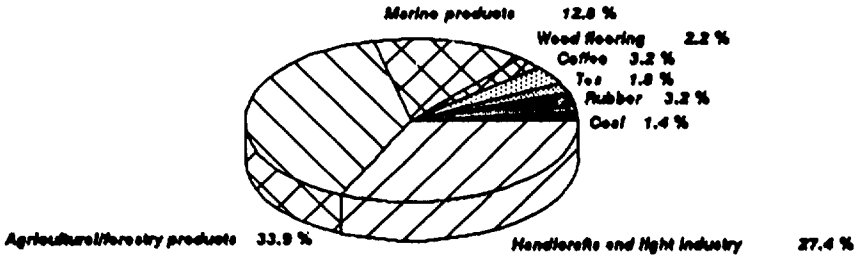
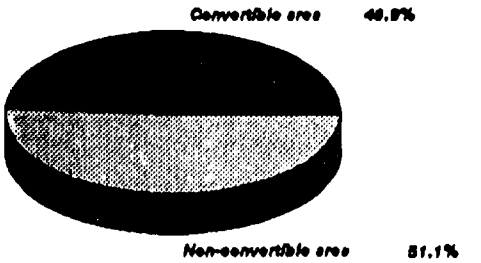


Fig.VI. Exports and Imports, 1987

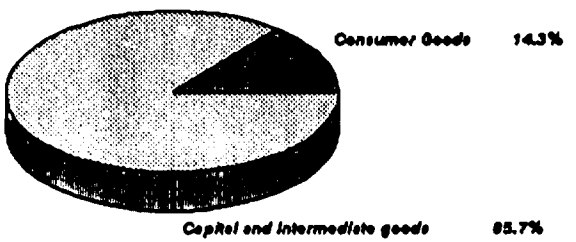
(Percentage)



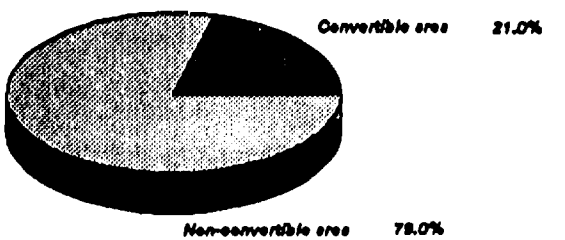
Composition of Exports



Destination of Exports

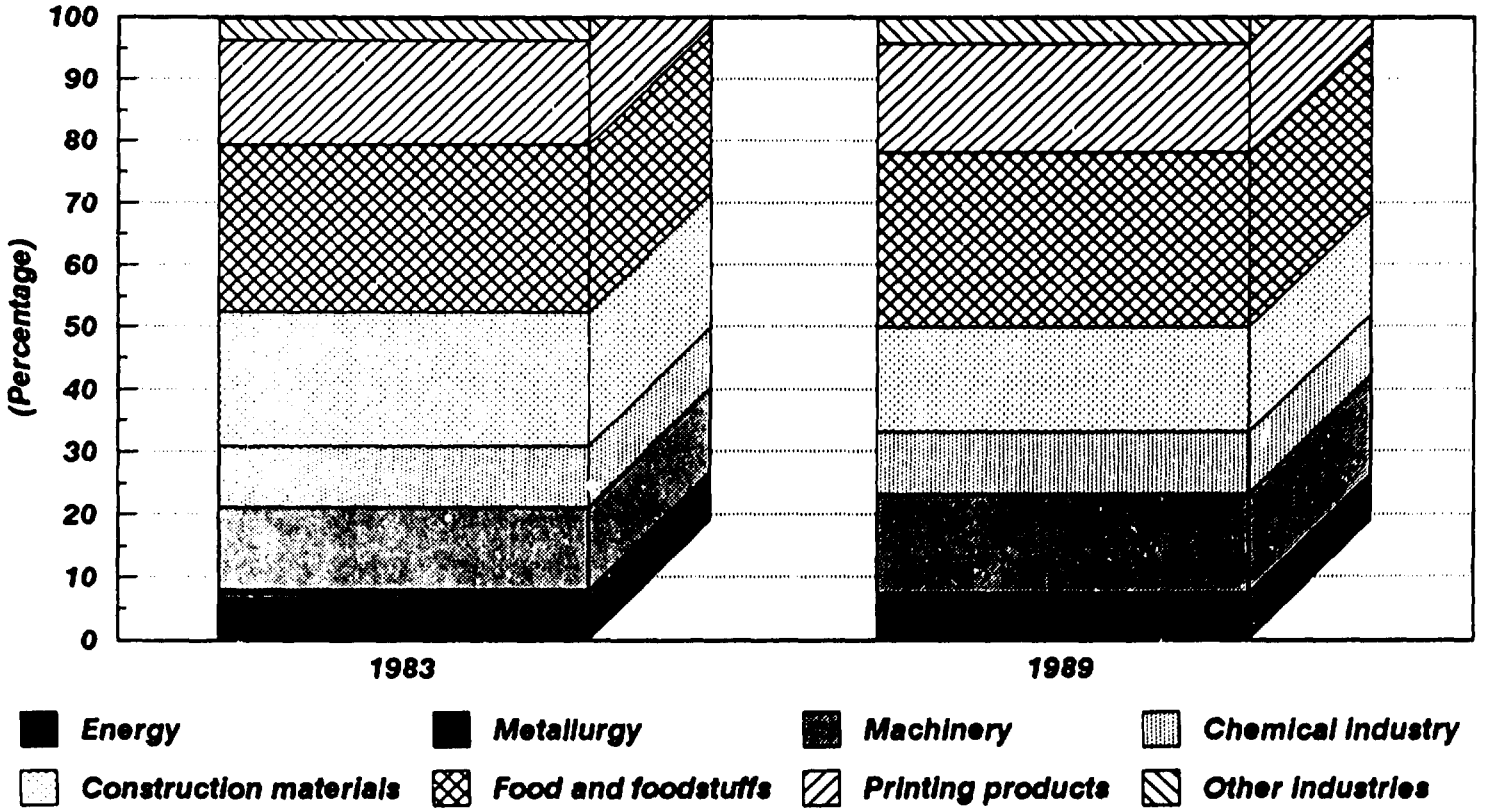


Composition of Imports



Origin of Imports

Fig.VII. Composition of industrial production, 1983 and 1989 (Percentage of total production)



III. THE MANUFACTURING SECTOR

A. GROWTH AND STRUCTURAL CHANGE

The industrial sector[1/] in Viet Nam exhibits several structural and institutional dichotomies. At one level it can be distinguished between State- and co-operatively or privately-owned enterprises, where the former can be owned and operated either by the central government or by various levels of regional government, including provincial, district and city governments. At another, it can be divided between heavy industries producing capital or producer goods, which in the socialist terminology employed in Viet Nam are referred to as "Group A" industries, and light industries producing consumer goods, which are described as "Group B" industries. Finally, it can be categorized according to scale of operation between large-scale industries and small-/medium-scale industries (SMIs), where the latter can range from small family-based artisanal establishments to quite substantial undertakings employing several hundred people.

There are some obvious correlations between these categories. The heavy industries, for example, are more likely to be State-owned than privately-owned, while the SMIs are more likely to produce consumer goods than capital goods. These relationships are by no means always exclusive, however. State-owned industries can thus be both large and small/medium in scale, and produce both capital and consumer goods, while privately-owned industries can also be both large and small/medium in scale although their output is more likely to consist of consumer rather than producer goods. By the same token, consumer goods industries may be owned either by the State or by co-operatives or private entrepreneurs. They may also be both large and small/medium in scale, although the latter is more likely.

The available data do not in all cases permit a precise quantification of the relative shares of these various subdivisions of the industrial sector. In particular, they provide only a very hazy indication of the proportions of industrial output accounted for by the State-owned and privately- or co-operatively-owned components of the sector. The best available estimates suggest that more than half of Viet Nam's industrial production is generated by State-owned enterprises, with co-operatives accounting for somewhat more than a quarter and private individuals for 16 per cent.[2/] These proportions are reversed in terms of employment generation, with less than one million of the total industrial labour force of three million being employed in the State-owned enterprises.[3/] As was argued in the previous Chapter, however, the boundaries between the publicly and privately administered parts of the Vietnamese economy are beginning to become blurred under the impact of recent economic reforms, which have reduced direct State control over the management of State-owned firms and permitted them to enter into joint ventures with private entrepreneurs.

Despite the fact that it thus accounts for a less than overwhelming share of the industrial sector as a whole, the State-owned component tends to be the only one that is comprehensively covered and documented by official Vietnamese statistics. The substantial private and co-operative components of the industrial sector are frequently neglected in these statistics, and their impact on overall industrial output and employment ignored. Though perhaps understandable in terms of the difficulties involved in collecting and compiling the relevant data from these much more diffuse and diverse subsectors, this omission of private sector statistics can sometimes lead to inappropriate and misleading interpretations being drawn about the industrial sector as a whole from the partial data for the State-owned component presented by the Vietnamese authorities.

As shown in Table I.1, the industrial sector as a whole recorded rapid rates of growth averaging more than 10 per cent per annum in real terms between 1983 and 1988, although an apparent contraction of industrial output in 1989 caused a decline in the average annual growth rate to that year. In either case, however, the rate of growth of the industrial sector substantially exceeded the rate of overall GDP growth, as a result of which the share of industrial output in GDP rose from less than 22 per cent in 1983 to a peak of 26.3 per cent in 1988 before easing to 24.3 per cent in 1989. This confirmed the position of the industrial sector as the second most important source of output and income generation after agriculture.

As also noted in the previous Chapter, there has been a distinct shift in the industrial policies and priorities of the Government of Viet Nam since the early 1980s, which has had a wide ranging impact not only on the State-owned enterprises that dominate industrial production but also on the industrial sector more generally. In the immediate aftermath of Viet Nam's reunification, the government sought to extend to the whole country the orthodox socialist industrial strategy emphasizing the establishment of a heavy industrial base which had been pursued in North Viet Nam since the 1950s. While acknowledging that a rapid expansion of agricultural and light industrial production was necessary to meet the pressing consumption requirements

of the population, the First National Plan launched in 1976 therefore continued to regard the development of Viet Nam's heavy industrial base as the principal long-term objective of the government's economic policy.

Faced with severe resource constraints, however, the government proved unable to meet the industrial growth target of 16-18 per cent per annum set by the plan. Output of capital goods increased at an annual rate of only 1.1 per cent during this period while output of consumer goods actually declined by 0.6 per cent per year. This disappointing performance provoked an extensive review of the government's economic policy in general and its industrial policy in particular, which culminated in the adoption of several important reforms discussed in greater detail in Chapters I and II. These included the "triple plan" system introduced in 1981 to increase capacity utilization in the State-owned industries, and the "new economic orientations" embraced in 1982, which involved a shift of emphasis in favour of light industrial production and a significant devolution of decision-making powers from State planners to the managers of individual State-owned enterprises.

The result of these reforms was a considerable acceleration of industrial output growth. In the State-owned sector, to which the bulk of the limited data available refer, a rate of gross industrial output growth of 9.5 per cent per annum was achieved during the period of the Second National Plan from 1981 to 1985. Although the heavy industrial sector did make a significant contribution to this overall performance as a number of important projects initiated during the previous plan period came on stream, its annual average growth rate amounted to only 6.4 per cent. In contrast, the light industrial sector experienced a growth rate of 11.2 per cent per annum during this period. As a result of these differential growth rates, the share of light industrial goods in the total industrial output produced by State-owned enterprises increased from 62.2 per cent in 1980 to 67.3 per cent in 1985. As subsequent industrial policy has continued to stress light industry, its share rose further to 71.1 per cent in 1989.

Production data for Viet Nam's principal manufactured goods are presented in Table III.1. These data illustrate Viet Nam's capacity to manufacture a variety of heavy industrial products, including cement, chemical fertilizers and insecticides, and heavy engineering goods. At the same time, however, they also underline the fact that the country's manufacturing sector remains primarily oriented towards the production of basic consumer goods. These are produced primarily, but not exclusively, by SMIs, which may be owned by the State or by co-operatives or private entrepreneurs.

B. PRODUCTIVITY AND PERFORMANCE

The industrial sector is shown by official Vietnamese data to be the second most important source of employment generation in the country after agriculture. Labour absorption data for the economy as a whole presented in Annex Table A-4 thus show that almost 3.4 million workers, or some 12 per cent of the total employed labour force of 28.8 million, were engaged in industrial activities in 1989. In the State-owned industrial enterprises, meanwhile, the latest available data reproduced here in Annex Table A-5 show that the level of employment increased by about 4.1 per cent per year between 1976 and 1988, from 519,200 to 843,900. To the extent that the data in Annex Tables A-4 and A-5 are comparable, they indicate that the State-owned industrial sector accounted for approximately 3.0 per cent of total labour absorption in the Vietnamese economy in 1989.

Within the State-owned sector, however, the heavy and light industrial components are shown to account for significantly different relative shares of employment. As shown in Annex Table A-5, employment in heavy industries has traditionally exceeded employment in light industries by an appreciable, albeit declining, margin, which was reversed in 1988. In 1976, employment in heavy industries accounted for 57.4 per cent of total employment in the State-owned industrial sector, with this proportion declining to 54.2 per cent in 1986 and 48.6 per cent in 1988.

Bringing together the production data in Table I.5 with the employment data in Annex Table A-5, it is possible to estimate implicit levels of gross industrial production per employee. These estimates are presented in Annex Table A-6 for the 1983-1987 period, and indicate a sharp decline in the rate of growth of labour productivity in the State-owned industrial sector as a whole in 1985. This reflects the general economic malaise prevailing at the end of the Second National Plan in 1985, which is described in the previous Chapter and is generally believed to have arisen from the return to socialist orthodoxy in 1982/83 after the partial economic liberalization instituted in the preceding years. This took its toll not only on the workers' incentives and morale, but also exacerbated the existing inefficiencies in resource allocation and

utilization, which resulted in a variety of input supply problems and infrastructural bottle-necks and by 1986 had resulted in a decline in industrial capacity utilization to approximately 50 per cent.

Table III.1. Principal industrial products, 1976-1990[a/] (selected years)

	1976	1980	1985	1986	1987	1988	1989
Steel ('000 tonnes)	63.8	60.3	61.6	64.4	69.5	74.1	75.0
Chromium ('000 tonnes)	...	...	4.1	3.2	4.0	2.6	...
Coal (million tonnes)	5.7	5.2	5.7	6.4	6.8	6.9	3.8
Cement ('000 tonnes)	743	633	1,503	1,526	1,656	1,934	1,975
Bricks (million units)	3,704	2,297	2,932	3,283	3,691	3,807	3,923
Glass and products ('000 tonnes)	35	41	57	54	47	53	...
Porcelain (million units)	79	101	167	184	215	208	...
Chemical fertilizers ('000 tonnes)	435	360	531	516	485	503	373
Insecticides ('000 tonnes)	15	8	18	7	11	13	4
Bicycle tyres (million units)	5.22	4.93	11.56	10.59	12.67	11.27	9.03
Bicycle tubes (million units)	4.86	5.01	6.04	4.50	5.68	6.43	5.64
Wood and products ('000 sq m)	1,553	1,577	1,441	1,680	...	...	...
Paper ('000 tonnes)	75	49	79	90	88	88	72
Matches (million packets)	292	251	158	146	139	117	58
Metalworking machine tools (units)	...	...	964	1,090	1,191	115	...
Diesel motors (units)	3,225	3,116	5,312	6,213	6,650	6,500	...
Electric motors (units)	10,925	15,112	15,359	15,149	13,200	19,800	12,400
Transformers (units)	547	575	479	447	690	880	1,400
Water-pumps (units)	1,844	1,496	753	850	690	1,227	411
Rice milling equipment (units)	...	...	1,196	1,302	1,176	1,209	...
Ploughs and harrows ('000 units)	...	...	309	297	352	...	...
Bicycles ('000 units)	91.3	137.1	197.3	263.3	299.5	286.1	196.0
Tractors (12 hp) (units)	464	1,600	1,103	1,200	2,004	2,203	10
Textile fibres ('000 tonnes)	...	...	51	53	57	62	...
Cotton fabrics[b/] (million metres)	218	179	449	358[c/]	361[c/]	384[c/]	306[c/]
Washing soap ('000 tonnes)	...	...	51	72	47	52	52
Salt ('000 tonnes)	584	477	676	763	847	851	811
Sugar ('000 tonnes)	73	167	401	346	323	366	377
Fish sauce (million litres)	...	...	143	158	155	176	185
Beer (million litres)	...	...	87	87	84	98	...
Cigarettes (million packets)	404	396	1,050	1,118	982	888	1,210

Source: Data provided by Vietnamese authorities as cited in United Nations Industrial Development Organization, *Viet Nam's Industrial Development - An Assessment*, Report by the Regional and Country Studies Branch, Industrial Policy and Perspectives Division, UNIDO, Vienna, August 1989, page 29 (data for 1976-1985); Socialist Republic of Viet Nam, General Statistical Office, *Statistical Data of the Socialist Republic of Vietnam 1976-1989*, Statistical Publishing House, Hanoi, 1990, pages 82-83 (data for 1986-1989).

a/ Totals may not add due to rounding.
b/ Includes cotton fabric for mosquito netting.
c/ Excludes cotton fabric for mosquito netting.

This deterioration in the economic environment in general and in the performance of the industrial sector in particular provided the main impetus for the introduction of reformist policies from 1985 onwards, which culminated in the adoption of the *doi moi* programme of economic renewal in December 1986. The gradual but accelerating recovery in the Vietnamese economy stimulated by these reformist measures is mirrored in a steady improvement of labour productivity in the industrial sector after 1985. The data in Annex Table A-6 thus suggest that overall labour productivity in the State-owned industrial sector increased by 2.7 per cent in 1986 and 4.1 per cent in 1987, after having expanded by only 1.7 per cent in 1985.

The overall indicators of labour productivity in the State-owned industrial sector noted above mark considerable differences between the heavy and light industries. Heavy industry, which accounts for a significant majority of the labour force employed in the State-owned sector but contributes only a relatively small proportion of its output, has a much lower rate of labour productivity than light industry. Because of its comparatively slow rates of output growth, moreover, heavy industry also achieved only relatively modest improvements in labour productivity of 1 per cent or less per year in 1986-87. Light industry, meanwhile,

recorded much more substantial increases in labour productivity of 3.6 per cent in 1986 and 5.0 per cent in 1987. This was the result both of the rapidly increasing output levels recorded by the light component of the State-owned industrial sector, and of its more modest contribution to labour absorption. In an effort to rationalize the economy the government decided in late 1990 to close more than one-fifth of State companies that are loss making, although no timetable for the closures has been given.

While the data in Tables I.5 and III.1 indicate a creditable growth performance by the industrial sector during much of the past decade, with particularly impressive rates of growth being recorded by light "Group B" industries, Viet Nam's output of many consumer goods remains insufficient to satisfy domestic demand. This is highlighted by the following average *per capita* production estimates for a selection of important consumer goods in 1988-89:

Paper	1.1 kilogram (1989)
Cotton fabrics	4.8 metres (1989)
Hosiery	0.4 pieces (1988)
Porcelain	3.3 pieces (1988)
Matches	0.9 packets (1989)
Soap	0.8 kilogram (1989)

Bearing in mind the pre-eminence of light industries in Viet Nam's industrial sector, these low levels of *per capita* production of consumer goods imply substantially lower levels of *per capita* production of producer goods. These low output levels reflect both a relatively low industrial capacity and a low rate of utilization of the limited capacity available. The latest available data indicate, for example, that the total number of State-owned enterprises engaged in light industrial activities amounted to about 1,500, which were supplemented by about 6,000 industrial and artisanal co-operatives with less than 500 members each. Industrial capacity utilization, meanwhile, was estimated at only 50-60 per cent in 1987.

Several reasons suggest themselves for the modest size and sophistication of the Vietnamese industrial sector and the low rate of capacity utilization. These include old and obsolete plant and equipment, poor maintenance of existing production facilities, deficiencies in management and insufficient supplies of suitably skilled labour, infrastructural inadequacies, limited inter-industry linkages, and shortages of inputs and spare parts as well as the foreign exchange required to import them from abroad. The combined effect of these weaknesses has been to restrain severely the development of Viet Nam's industrial sector.

Almost all of the equipment in use in Viet Nam's industrial establishments is very old. One recent report has claimed, for example, that "the most advanced facilities of North Vietnamese industry are 1950 Soviet vintage", and that "more modern facilities exist in the South, but little of that capacity is heavy industrial".[4/] The more recently acquired equipment is usually second hand, moreover, and hence also of antepenultimate vintage.

In line with the advanced age of the country's industrial plant and machinery, the production techniques employed in Viet Nam are also frequently dated. Vietnamese enterprises often have considerable difficulties in absorbing and exploiting effectively even the relatively low levels of technology embodied in this obsolescent equipment, however, and the country's industrial production processes tend to be both inadequately organized and inefficient. Equipment and factory premises are often poorly maintained, not only because of a lack of the necessary spare parts and materials but also because of the absence of well-organized maintenance programmes and a lack of interest in the subject, which is underlined by high levels of untidiness in most industrial production facilities. Most workplaces also lack proper production line organization, resulting in an inadequate co-ordination and integration of individual workers within the overall system of production, and also in high levels of wastage.

Staffing levels and the training and supervision of production workers are also frequently inappropriate. Several UNIDO missions visiting Viet Nam in recent years have found that indirect workers - i. e. workers not directly involved in the production process - often comprise an inordinately high proportion of the work force of Vietnamese industrial enterprises. This preponderance of indirect workers is particularly remarkable in as much as these enterprises usually have no commercial, marketing or research departments of their own, and for the most part support only rudimentary maintenance and accounting sections. On the other hand, however, these missions have usually found a dearth of middle ranking managerial and supervisory staff, and that production workers are therefore to a large extent left to themselves. This has several unfavourable consequences, which include inadequate levels of worker co-ordination and quality control. Significant skill

gaps among employees at almost all levels of production and management were also observed by the UNIDO missions, which recommended that more efforts should be made to enhance the skills of shop-floor workers as well as professional and managerial staff.

Beyond these plant level constraints, there are a number of wider structural and institutional weaknesses which inhibit the optimal exploitation of Viet Nam's industrial resources and restrain the further development of the country's industrial sector. A particularly important issue in this context is the highly complex and diffuse process of industrial decision making, in which a wide range of interests - including officials from numerous government ministries, enterprise managers, and planners - are directly involved. Apart from causing long delays, this results in a lack of transparency in the decision-making process, and renders it difficult to assign accountability for risks and results to any specific agency or individual.

Although a wide range of industrial activities have been established in Viet Nam with a potential for significant inter-industry linkages which could create a foundation for industrial development and accelerated economic growth, the degree of integration both within the industrial sector and with other sectors remains very limited at present. The close network of specialized industrial companies, which provide each other with orders, inputs, and inspirations for technical and organizational innovation, and thus make a major contribution to the international competitiveness of a country's industrial establishment, is almost entirely lacking in Viet Nam.

Four specific dimensions of this lack of industrial integration can be distinguished. The first of these involves a relatively low level co-operation between industrial enterprises themselves, with most of the larger enterprises of this kind tending to be largely self contained and operating in isolation from each other. This reflects a relatively high degree of passivity within the Vietnamese industrial sector, with most of the enterprises operating within it being prepared to accept imposed decisions rather than actively seeking new opportunities for a beneficial exchange of products, parts and components.

The second dimension of this lack of industrial integration involves an inadequate co-ordination of the products and needs of the industrial sector with those of other productive sectors. This is particularly noticeable in the industrial sector's relations with the agricultural sector. The linkages between these two sectors could be substantially strengthened to the mutual benefit of both, and of the Vietnamese economy as a whole, with the industrial sector being used to supply agricultural inputs and production equipment, and the agricultural sector being used to supply industrial raw material.

The third dimension involves a lack of appropriate links between industry and academic and other research institutions. This prevents the research and development capabilities of these institutions from being exploited for industrial development, and has played an important role in the industrial sector's lack of innovation. The establishment of more systematic linkages between industrial enterprises and centres of scientific and technological research could significantly improve the efficiency and competitiveness of Vietnamese industry.

The fourth dimension of this problem, finally, refers to the poor regional linkages between the industrial enterprises. This is particularly marked between the northern and southern parts of the country where different resource endowments and historical experiences have given rise to significant complementarities. These have been only very inadequately exploited, however, because of the still relatively weak economic ties between these regions, which have even given rise to a considerable degree of industrial duplication.

While the vagaries of the central planning mechanism have clearly played an important role in preventing the emergence of beneficial inter-industry linkages, their absence can also to a large extent be attributed to Viet Nam's poor transport and communications infrastructure. This hampers the transmission of market signals between firms, industries, sectors and regions, and restricts the movement of goods and people, thereby inhibiting the growth of specialization and trade. A comprehensive revitalization of transport and communications facilities is therefore an important prerequisite for a fuller integration of the Vietnamese economy.

Chronic shortages of foreign exchange have also played an important role in restraining industrial production and development. The UNIDO missions to Viet Nam undertaken in recent years have frequently found the inability of firms to obtain imported equipment, raw materials and spare parts to be one of the most binding constraints on their activities. To a considerable extent, moreover, the effect of these foreign exchange shortages is self-perpetuating - the inability of Vietnamese firms to import foreign production materials and

technologies limits their scope for improving their efficiency and productivity, which in turn prevents them from increasing their international competitiveness and increasing their foreign exchange earnings.

The foreign exchange situation in Viet Nam has long been complicated by the operation of an extensive parallel market in foreign currencies, and the United States dollar in particular. UNIDO missions have thus noted with bemusement the paradoxical coincidence of a shortage of foreign exchange for developmental purposes with a widespread and apparently quite significant internal circulation and hoarding of foreign exchange within Viet Nam. Industrial enterprises were thus found to quote their domestic prices not only in dongs but also partly in United States dollars, and to pursue the peculiar practice of "exporting (against the dollar) on the domestic market".

Such dollar denominated sales in the domestic market provide an important mechanism for transferring foreign exchange resources between firms to enable them to cover foreign exchange costs in excess of their official foreign exchange allocations. The dollar prices charged for these transactions reflect the relative scarcity of foreign exchange rather than of the goods traded, however, and make no reference to international prices or any other economic performance criteria. This internal foreign currency trade may therefore have negative consequences for industrial development by forcing productive enterprises to underprice (some of) their output, and hence transfer some of their value added to the buyers of their products. The misallocation of resources involved in these transactions is compounded, moreover, by the common practice of firms acquiring the foreign exchange to spend it on excessive stockpiles of imported raw materials and parts.

The introduction of measures to rationalize the handling of foreign exchange is therefore acknowledged to be a crucial prerequisite for the effective development of the industrial sector. The foreign exchange policy reforms adopted in early 1989, which involved an abandonment of the complex system of multiple exchange rates previously employed in the conduct of Viet Nam's trade with the convertible area as well as two sharp devaluations of the dong in 1989 and 1990 represented a significant step in this direction. The beneficial effect of this and other recent reforms on Viet Nam's external trade performance, reinforced by the dramatic improvement in rice exports since 1989 and the improving prospects for private foreign investment, augurs well for the future, however, and is expected to allow a gradual easing of Viet Nam's long standing foreign exchange constraint in the coming years despite the impending shift of intra-CMEA trade to market prices and hard currency settlements.

C. TRADE IN MANUFACTURES

Viet Nam's official foreign trade statistics are generally acknowledged to be subject to a considerable margin of error. Substantial trade flows, especially those involving military imports from the USSR and other CMEA countries, have usually not been included in these statistics, for example, and the unit values assigned to many of Viet Nam's traded goods in these data are of doubtful validity since much of Viet Nam's trade with the USSR and CMEA countries has been conducted on a semi-barter basis. The practice of valuing the transferable ruble (used as the standard unit of account for measuring Viet Nam's trade with the non-convertible area) at par with the United States dollar must also be regarded as highly questionable. Considerable caution therefore needs to be exercised in interpreting Vietnamese trade data.

These caveats notwithstanding, the official estimates of Viet Nam's trade flows reproduced in Tables III.2 to III.5 indicate that manufactures account for a significant share of Viet Nam's external trade. In terms of exports, Table III.2 shows that handicrafts and light industrial goods alone accounted for almost half of the total value of Viet Nam's exports in 1983, although this share declined in subsequent years, it still amounted to more than a quarter in 1987. While these figures may be distorted by the effect of the socialist accounting practices employed in Viet Nam, there seems little doubt that such handicrafts and light industrial goods make an important, if still largely unquantifiable, contribution to Viet Nam's overall export earnings. Apart from pure handicrafts, the products covered by this category include fine art goods and, increasingly, a variety of labour-intensive manufactures such as textiles and garments.

Much of the remainder of Viet Nam's export trade is commodity based. Even these export products embody a distinct, if modest, component of manufacturing value added, however, since they frequently need to be processed into an intermediate stage before they can be exported. Rubber, for example, needs to be milled into sheets or crumbed prior to export, tea needs to be dried, coffee needs to be converted from the cherry to the bean or parchment stage and to be hulled, and wood flooring needs to be sawn and planed. Such

Table III.2. Exports by commodity, 1983-1987[a/]
(US dollars/transferable rubles million[b/])

	1983	1984	1985	1986	1987
Centrally managed enterprises:	538	595	636	665	720
Coal	28	26	40	34	12
Convertible area	22	22	35	29	10
Non-convertible area	6	4	5	5	2
Rubber	30	31	30	30	28
Convertible area	5	7	2	2	6
Non-convertible area	25	24	28	28	22
Tea	14	14	20	17	16
Convertible area	3	3	5	4	2
Non-convertible area	11	11	15	13	14
Coffee	5	10	16	16	28
Convertible area	-	-	2	2	24
Non-convertible area	5	10	14	14	4
Wood flooring	10	13	12	12	19
Convertible area	-	-	-	-	-
Non-convertible area	10	13	12	12	19
Marine products	40	49	80	82	73
Convertible area	40	49	60	70	73
Non-convertible area	-	-	20	12	-
Agricultural/Forestry products	125	165	170	140	198
Convertible area	35	50	50	35	38
Non-convertible area	90	115	120	105	160
Handicrafts and light industry	286	287	268	251	221
Convertible area	69	75	72	45	10
Non-convertible area	217	212	196	206	211
Petroleum	-	-	-	-	30
Convertible area	-	-	-	-	30
Non-convertible area	-	-	-	-	-
Unclassified	-	-	-	83	95
Convertible area	-	-	-	-	77
Non-convertible area	-	-	-	-	18
Locally managed enterprises[c/]:	50	70	110	120	160
Marine products	20	25	20	25	40
Agricultural products	26	39	70	75	100
Handicrafts and light industry	4	6	20	20	20
Total:	588	665	746	785	880
Convertible area	224	276	336	307	430
Non-convertible area	364	389	410	478	450
Ratios (percentage of total)					
Exports to:					
Convertible area	38	42	45	39	49
Non-convertible area	62	58	55	61	51
Exports from:					
Centrally managed enterprises	91	89	85	85	82
Locally managed enterprises	9	11	15	15	18

Source: Data provided by Vietnamese authorities as cited in United Nations Industrial Development Organization, *Viet Nam's Industrial Development - An Assessment*, Report by the Regional and Country Studies Branch, Industrial Policy and Perspectives Division, UNIDO, Vienna, August 1989, page 45.

a/ Totals may not add due to rounding.

b/ Transferable ruble valued at par with US dollar.

c/ To non-convertible area only.

processing activities on domestically produced agricultural commodities have a considerable potential for future enhancement, and are indeed widely regarded as an important starting point for the progressive industrial development of countries with rich natural resource endowments like Viet Nam.

Table III.3. Principal exports by commodity, 1983-1989[a/]
(Thousand tonnes)

	1983	1984	1985	1986	1987	1988	1989
Coal	700	550	500	752	233	349	643
Convertible area	550	460	400	550	...	...	...
Non-convertible area	150	90	100	202	...	...	...
Rubber	35	35	36	37	35	38	46
Convertible area	5	6	4	7	...	...	...
Non-convertible area	30	29	32	30	...	...	...
Tea	12	11	12	11	12	15	15
Convertible area	2	3	2	2	...	...	...
Non-convertible area	10	8	10	9	...	...	...
Coffee	5	4	8	19	21	25	50
Convertible area	-	1	2	6	...	...	...
Non-convertible area	5	4	7	13	...	...	...
Wood flooring	55	32	40	46	40	...	...
Convertible area	-	-	-	-	-	...	...
Non-convertible area	55	32	40	46	40	...	...
Marine products	10	25	35	12	13	21	...

Source: Data provided by Vietnamese authorities as cited in United Nations Industrial Development Organization, *Viet Nam's Industrial Development - An Assessment*, Report by the Regional and Country Studies Branch, Industrial Policy and Perspectives Division, UNIDO, Vienna, August 1989, page 46 (data for 1983-1985). Socialist Republic of Viet Nam, General Statistical Office, *Statistical Data of the Socialist Republic of Vietnam, 1976-1989*, Statistical Publishing House, Hanoi, 1990, page 119.

a/ Totals may not add due to rounding.

Perhaps somewhat surprisingly in terms of Viet Nam's current state of economic development, but less surprisingly in view of the country's endemic foreign exchange shortages, the import data presented in Tables III.4 and III.5 reveal that imports of manufactured end-use products play only a comparatively modest role in Viet Nam's overall import trade. Table III.4 shows, for example, that fuel, raw materials and food grains accounted for almost 64 per cent of the value of imports arranged by enterprises managed by the central government in 1987, which themselves accounted for 92 per cent Viet Nam's total exports by value in that year. Machinery and equipment accounted for 27 per cent of imports by centrally managed enterprises, while "other" consumer goods, which doubtless include a significant share of manufactured products, accounted for a further 9 per cent.

In view of the extensive parallel market in smuggled stocks of manufactured consumer goods, however, these data are almost certain to understate the true extent of manufactured imports. The share of manufactures in total recorded imports would also rise significantly if a broader definition of manufactures extending beyond end-use products were adopted. In this case the bulk of Viet Nam's fuel imports, which consist primarily of refined petroleum products for industrial use, might be defined as manufactures, as well as a substantial proportion of the country's raw material imports, such as chemical fertilizers, steel, and cotton yarn.

D. INVESTMENT AND OWNERSHIP PATTERNS

As noted at the beginning of this Chapter, three principal forms of corporate ownership can be distinguished in Viet Nam's industrial sector. The most important of these is State ownership, with the State-owned enterprises generating more than half the country's industrial output. Co-operative ownership is, at least nominally, the second most important form of corporate ownership, with the latest available data indicating

that co-operatives account for approximately a quarter of Viet Nam's total industrial production. Private ownership is the third major form of corporate ownership, and remains surprisingly vibrant, especially in the south of Viet Nam, despite numerous efforts by the government to "socialize" the economy of southern Viet Nam in the late 1970s and early 1980s.

As also noted above and in Chapter I, however, Vietnamese business practices are currently in the state of considerable upheaval in response to the numerous deregulatory reforms introduced by the government since 1988. A hitherto virtually non-existent industrial subsector, owned by private foreign investors, appears to be on the verge of emerging. The establishment of a number of joint venture partnerships between these foreign firms and Vietnamese industries is also beginning to change the corporate landscape in Viet Nam.

Table III.4. Imports, 1983-1989[a/]
(US dollars/transferable rubles million[b/])

	1983	1984	1985	1986[c/]	1987	1988	1989
By origin							
Total imports	1,310	1,560	1,590	2,155	2,191	2,757	2,444
Convertible area	330	468	459	453	465	728	645
Non-convertible area	980	1,092	1,131	1,702	1,726	2,029	1,798
Consumer goods	145	198	252	339	314	366	250
Convertible area	110	168	181	239	234	...	...
Non-convertible area	35	30	71	100	80	...	...
Capital and intermediate goods	1,165	1,362	1,338	1,816	1,877	2,391	2,194
Convertible area	220	300	278	214	231[c/]	...	...
Non-convertible area	945	1,062	1,060	1,602	1,646	...	...
By type of enterprise							
Centrally managed enterprises	1,240	1,470	1,463	2,029	2,026	...	...
Consumer goods	125	180	200	285	244	...	...
Food-grains	10	70	87	85	60	...	...
Other	115	110	113	200	184	...	...
Capital and intermediate goods	1,115	1,290	1,263	1,744	1,782	...	...
Machinery and equipment	140	110	200	722	548	...	...
Fuel and raw materials	975	1,180	1,063	1,022	1,234	...	...
Locally managed enterprises	70	90	127	126	165	...	...
Consumer goods	20	18	52	51	70	...	...
Capital and intermediate goods	50	72	75	75	95	...	...
Ratios (percentage of total)							
Imports from:							
Convertible area	25	30	29	21	21	26	26
Non-convertible area	75	70	71	79	79	74	74
Imports by:							
Centrally managed enterprises	95	94	92	94	92	...	...
Locally managed enterprises	5	6	8	6	8	...	...

Source: Data provided by Vietnamese authorities as cited in United Nations Industrial Development Organization, *Viet Nam's Industrial Development - An Assessment*, Report by the Regional and Country Studies Branch, Industrial Policy and Perspectives Division, UNIDO, Vienna, August 1989, page 47 (data for 1983-1987); Socialist Republic of Viet Nam, General Statistical Office, *Statistical Data for the Socialist Republic of Vietnam 1976-1989*, Statistical Publishing House, Hanoi, 1990, page 120 (data for 1989-1989).

a/ Totals may not add due to rounding.
b/ Transferable ruble valued at par with US dollar.
c/ The large increase in recorded imports from the non-convertible area reflects the adoption of a more comprehensive coverage to include imports wholly financed by long term loans from that area.
d/ Includes imports worth TRb30 million for the joint Soviet-Vietnamese petroleum venture.

Table III.5. Principal imports by commodity, 1983-1989[a/]
(Thousand tonnes, except as stated)

	1983	1984	1985	1986	1987	1988	1989
Rice	30	320	400	529	469	401	81
Corn and cornflour	30	-	-	-	-	-	-
Cotton textiles (million metres)	11	29	20	27	39	59	13
Petroleum products	1,800	1,700	2,000	2,028	2,419	2,451	2,161
Fertilizers	1,200	1,600	1,500	2,059	1,567	1,999	1,472
Raw cotton	50	38	50	54	65	64	51
Cotton yarn	4	2	3	7	9	...	...
Steel	280	280	300	350	434	490	389
Sugar	80	70	-	55	61	29	...
Trucks ('000 units)	4	4	3	5	4	4	4
Tractors ('000 units)	1	...	1	5	6	4	7

Source: Data provided by Vietnamese authorities as cited in United Nations Industrial Development Organization, *Viet Nam's Industrial Development - An Assessment*, Report by the Regional and Country Studies Branch, Industrial Policy and Perspectives Division, UNIDO, Vienna, August 1989, page 48 (data for 1983-1985); Socialist Republic of Viet Nam, General Statistical Office, *Statistical Data for the Socialist Republic of Vietnam 1976-1989*, Statistical Publishing House, Hanoi, 1990, page 120 (data for 1989-1989).

a/ Totals may not add due to rounding.

State-owned industries may be of two kinds, depending upon whether they are operated by the central government or by local (provincial, district or city) governments. The centrally managed enterprises are frequently large in scale and dedicated to the manufacture of "heavy" industrial products. They have in the past also frequently been the least efficient because they were subject to the most rigorous centralized control. The granting of a considerable degree of managerial autonomy in recent years, combined with the recently acquired ability of these firms to establish joint ventures with domestic and foreign private sector enterprises, bodes well for their future prospects. The locally managed enterprises, meanwhile, tend to be much smaller in scale and to concentrate on the production of light industrial goods. Especially in the southern part of the country, where the market skills acquired during the two decades of partition have persisted into the present, these enterprises also tend to operate at a much higher level of efficiency than the centrally managed enterprises.

Investment in industrial production capacity has until recently been concentrated in the State-owned sector. As suggested by the data in Table I.5, heavy industry, and hence the centrally managed component of this sector, was the chief beneficiary of whatever investment was undertaken. More recently, following the granting of an increasing degree of economic autonomy to the regions, the locally operated enterprises have also become able to raise their investment profile. Following the introduction of the 1987 Foreign Investment Law and its subsequent supplementary and clarificatory decrees, the near monopoly on large-scale new investment previously held by the State sector is being eroded by the increase in private investment opportunities. By the beginning of September 1990, as noted above in Chapter II, 183 applications for foreign direct investment projects with a total value of $1.2 billion had been approved by the Government of Viet Nam.

E. INDUSTRIAL LOCATION

Largely as a result of their different historical experiences, the northern and southern parts of Viet Nam have acquired very different industrial structures. Heavy industries, including those producing iron and steel, chemicals, cement, fertilizers, engines and vehicles, and agricultural implements, are concentrated in the north. Light industries are located throughout the country, but are particularly prevalent in the south. The generally less rigid attitudes of the southern political leaders and bureaucrats are also having the effect of luring much of the new foreign investment into the south, which already has a more important non-State sector than in the north and has an industrial production level about twice as high as that of the north.

F. SCIENTIFIC RESOURCES FOR INDUSTRIAL DEVELOPMENT

Science and technology constitute an important prerequisite for the continuous renewal and upgrading of industrial production processes and products. Indeed, a country's future competitive strength will to a large extent be determined by its capacity to develop or acquire scientific and technological innovations. Industrial and industrializing countries must therefore mobilize and channel their available scientific resources in support of industrial development if they are to increase, or even maintain, their relative industrial strength.

Research and experimental development (R & D) in Viet Nam is performed by a large number of institutions, the majority of which are financed through the State budget. These institutions can be distinguished into three categories:

- Laboratories and other R & D units operated by the various sectoral ministries. These specialized units correspond to in-house industrial laboratories within firms or corporate structures in western countries, which are largely unknown in Viet Nam.

- Specialized R & D establishments at the national level, including the National Centre for Scientific Research of Viet Nam, the National Institute of Technology and the National Institute of Atomic Energy. The most significant of these is the National Centre for Scientific Research, popularly abbreviated as the National Science Centre, which provides basic research facilities in mathematics and theoretical physics, and facilities for applied R & D in a number of other fields.

- Research departments and specialized R & D institutes at universities and other establishments of higher education. These often co-operate closely with the National Science Centre and other similar bodies operated by the government.

The latest available data indicate that some 13,800 scientists and engineers were active in the ministerial laboratories and a further 6,200 in the university research departments in the mid-1980s. In addition, it was conservatively estimated by a recent UNIDO mission to Viet Nam that about 1,300-1,500 research scientists were employed at the major national R & D institutions at that time.[5/] Based on these estimates, which may be scaled up to a total of about 2,500 by the end of the 1980s, more than 70 per cent of Viet Nam's scientific community is engaged in industrially-oriented research and experimental development activities, with the remainder being engaged in more general academic research at the country's universities.

Similar quantitative indicators for the distribution of R & D technicians and other supporting personnel in the mid-1980s are not available. Official estimates for the early 1980s reproduced in Annex Table A-9 reveal, however, that the number of such technicians directly engaged in R & D activities amounted to almost 8,900. In addition to these technicians, moreover, the Vietnamese R & D establishment is estimated to have employed no less than 8,500 auxiliary personnel, such as transportation workers, secretaries and other administrative staff, in the early 1980s. Calculations by UNIDO mission specialists have also revealed a much more rapid expansion of the numbers of R & D support staff than of scientists and engineers during this period.

Official estimates of public spending on R & D suggest that it amounted to 0.7 per cent of GDP in 1985 as shown in Annex Table A-10. Only about 6 per cent of the government's R & D funds are channelled into academic research, with the remaining 94 per cent being divided equally between the sectoral ministries and the specialized R & D institutions. This implies that university R & D facilities are less well equipped than those in the ministries and the specialized institutions, which possess the best staffed and most well equipped R & D units in the country.

The economic problem of the mid and late 1980s have provoked an erosion of Viet Nam's R & D infrastructure by restricting the availability of funds required to sustain it. This has resulted in cutbacks in the procurement of advanced instruments and scientific equipment, reduced the access of Vietnamese institutions to international scientific research, and forced these institutions to pay more attention to their "development" rather than their "research" functions. While these move towards experimental development work, testing and standardization, training and even small-scale industrial production may be beneficial in the short term by facilitating the diffusion of existing technologies, their medium- and long-term effect is to stifle future innovation and technological progress.

The Vietnamese R & D system also suffers from a lack of close co-ordination between its three principal components. Although they are intended in principle to maintain close links with another, these links are often very weak in practice, with each of the major institutions operating with a high degree of independence.

This lack of collaboration is exacerbated, moreover, by strict administrative procedures and decision-making rules, which impose effective barriers to such collaboration.

While the inputs into the R & D system are relatively easy to calculate in as much as they can be approximated by such physical indicators as manpower, equipment and financial resources, the outputs are considerably more difficult to quantify. One relevant output indicator is given by the number of patents registered by Vietnamese R & D institutions, which is shown in Annex Table A-11 amounted to 35 between 1987 out of total number of 367 applications filed. Similar data for other output variable is woefully lacking in Viet Nam, and urgently needs to be collated and disseminated to facilitate an effective planning mechanism for R & D activities.

Viet Nam is heavily dependent on imported technology, with most of the advanced machinery installed in the country having been delivered from abroad, with the CMEA countries representing the main source of the embodied technology in use in Viet Nam. The task of aiming and upgrading this technology is for the most part delegated to the ministerial laboratories and engineering facilities, which provide State-owned firms with a wide range of services while relieving them of the need to establish in-house R & D facilities. This structure is similar to that based on the Société d'Engineering de la Recherche Industrielle employed in France.

The most serious limitation to scientific development in Viet Nam is the country's relative isolation from the international scientific community. Contacts between Vietnamese scientists and other R & D specialists outside the CMEA countries are few and restricted and stimulation from abroad is weak. This shortcoming is widely recognized, however, and a more concerted effort to acquire and disseminate locally the results of foreign research is regarded as an urgent priority.

G. TECHNICAL CO-OPERATION FOR INDUSTRY

Foreign technology and assistance has made an important contribution to the development and growth of Viet Nam's still relatively youthful industrial sector. At the same time, however, the flow of aid and investment from developed market economies has been severely restricted by the imposition of United States economic sanctions on northern Viet Nam since 1964 and their extension to the southern part of the country since April 1975. This has not only prevented the employment of official and private United States capital in support of Viet Nam's economic and industrial development, but has also deterred other potential sources of assistance from providing such support.

For much of its post-reunification history, therefore, Viet Nam has depended primarily on its CMEA partners for the financial and technical assistance required to develop its industrial capacity. While no precise estimates of the extent of this assistance are available, and would in any case be difficult to compile in view of the socialist accounting conventions employed in valuing intra-CMEA trade and financial flows, a broad indication of the magnitude of those flows is nevertheless given in Tables III.2, III.4 and Annex Table A-2. These show that Viet Nam has traditionally been a significant net recipient of foreign loans from the CMEA area, and that foreign loans and grants have accounted for between 38 per cent and 85 per cent of the capital expenditure of the Government of Viet Nam between 1983 and 1989.

The assistance provided by the CMEA countries for Viet Nam's industrial development has taken several forms. One of the most notable examples is the Vietsovpetro corporation established to explore and exploit Viet Nam's hydrocarbon resources, which has taken the form of relatively orthodox joint venture partnerships between State-owned Vietnamese and foreign partners. In other cases, it has taken the form of complex buy-back arrangements designed to bring together the scientific and technical resources of the USSR and the European CMEA countries with the labour and raw material resources of Viet Nam for the common benefit of both parties. These arrangements have been particularly prevalent in the textiles and clothing industry and in the production and processing of agricultural crops such as rubber, tea, coffee, and tropical fruits. They have typically involved transfers of agricultural and industrial technology to promote the expansion of Viet Nam's output of both raw materials and end-products, with a proportion of these end-products being sold to the CMEA partner concerned.

Although it played a valuable part in fostering the growth of Viet Nam's industrial sector, the assistance received from the CMEA countries was fraught with a number of weaknesses. At one level, it was insufficient in scale to facilitate the desired rate of industrial expansion. At another level, the technology obtained from the CMEA countries was frequently obsolescent and inefficient, and only capable of producing comparatively low quality products. The desire to overcome these constraints and attract increased flows of more up to date industrial skills and equipment from non-CMEA sources was one of the main reasons

for the introduction of the foreign investment law of 1987. In view of the recently initiated restructuring of intra-CMEA economic relationships, the prior existence of this relatively liberal legal and institutional framework for the establishment of wide links outside the CMEA area seem to augur well for Viet Nam in the coming years.

As noted in the previous Chapter, the foreign investment law and its subsequent clarifying regulations and amendments have already had a significant impact, and helped to generate a considerable level of investment interest. With labour costs rising rapidly elsewhere in South-East Asia, and with Viet Nam being regarded as an increasingly attractive investment site by industrialists in Japan, Taiwan Province and the Republic of Korea, the outlook appears favourable for an increased inflow of foreign direct investment into labour-intensive manufacturing activities in Viet Nam. The resulting shift in the balance of the Vietnamese industrial sector's external links from the CMEA countries to the more dynamic economies of East Asia also promises to provide it with a more sophisticated technological base, management technique and output mix.

As a result of economic reform initiatives being pursued by the Government of Viet Nam external links with a number of developed market economies are expected to be reestablished. Thus, the German Parliament in late October 1990 unanimously resolved to resume development co-operation with Viet Nam and appealed to the Government of Germany to forgive Vietnamese's debts. The resolution envisages German assistance in the setting up a functioning banking system and an efficient financial administration. It also calls for assistance in setting up counselling services for Vietnamese businesses and providing information on how a "market economy with a social and ecological dimension" operates. Support would also be provided for restoration of transport infrastructure and low-rate credit to Viet Nam would be guaranteed by the State-owned Hermes insurance company. Similarly a relaxation of tensions between Viet Nam and the United States is also being noted. While United States companies are barred from Viet Nam by the "Trading with Enemy Act" informal contacts are being established and the American Chamber of Commerce in Hong Kong is now trying to organize a formal delegation to Viet Nam in early 1991.

UNIDO is playing an active role in encouraging the development of Viet Nam's manufacturing industry, both through country industrial surveys and industrial policy advice, a variety of direct technical co-operation projects and through the promotion of foreign investment. As indicated in Annex B4, which provides a summary of UNIDO's completed and ongoing technical co-operation projects, the agency has been active in various fields ranging from agro-industry, engineering, textiles, chemicals, metal products, metallurgy, handicraft and small industry to industrial policy formulation, and development of Viet Nam's institutional infrastructure for industrial development. In pursuit of its aim to stimulate increased private investment in Viet Nam's industry, moreover, UNIDO has identified a range of promising investment opportunities summarized in Annex B5, and is co-sponsoring an Investment Forum with the State Committee for Co-operation and Investment in Ho Chi Minh City on March 11-15, 1991.

NOTES TO CHAPTER III

1/ Vietnamese national accounts data present only aggregate figures for the industrial sector as a whole, and do not distinguish between various industrial subsectors. The industrial sector in this context is defined to include manufacturing, mining and the production of electricity, but excludes construction and the provision of other public utilities such as gas and water. No accurate assessment is therefore possible of the contribution of manufacturing industry alone to the Vietnamese economy. This is widely acknowledged to be the most important component of the industrial sector, however, even though mining plays a significant role in northern Viet Nam and the importance of electricity production is increasing as a result of several new power generation projects coming on stream.

2/ Socialist Republic of Viet Nam State, Planning Committee and United Nations Development Programme, *Report on the Economy of Vietnam*, January 1990, page 31.

3/ *Ibid*, page 126.

4/ Christopher F. Bruton and Mathilde L. Genovese, Vietnam: An Investor's Appraisal, *Business International Asia-Pacific*, Hong Kong, June 1990, page 48.

5/ United Nations Industrial Development Organization, *Viet Nam's Industrial Development - An Assessment*, Report by the Regional and Country Studies Branch, Industrial Policy and Perspectives Division, UNIDO, Vienna, August 1989, page 63.

IV. INDUSTRY BRANCH PROFILES

A. AGRICULTURAL PROCESSING

As a primarily agricultural economy, Viet Nam produces an extensive range of food and commercial crops. The further processing of these agricultural commodities therefore represents a significant proportion of manufacturing potential in the country. Indeed, it is increasingly coming to be recognized that the formulation of an effective industrial development strategy for Viet Nam would have to be focused to a large extent on identifying and building upon potential linkages between the secondary and primary sectors, with particular emphasis being given to agriculture.

As indicated in the individual commodity studies presented below, however, much of the potential of Viet Nam's agriculture-based processing industries remains unrealized. Considerable scope remains, in particular, for the achievement of increased efficiency through the adoption of new and improved equipment, processing technologies and organizational structures within these industries. On a wider scale, substantial efficiency gains can also still be achieved through the provision of a more favourable external operating environment for these industries. Measures to improve the institutional and infrastructural framework within which these industries operate would play a particularly important role in this context, especially if they are aimed at bringing about a closer integration of Viet Nam's disparate regional and local markets and expanding the existing linkages between various stages of agricultural processing.

Statistical documentation of the industries engaged in the processing of agricultural commodities tends to be sparse and distorted since much of this activity is carried out by small-scale privately or co-operatively-owned enterprises, which are ignored by official data collection agencies. Under these circumstances, a precise quantification of the relative importance of the State-owned and non-State-owned parts of the industry is clearly impossible. A report prepared in July 1989 by the Food and Agricultural Organization (FAO) of the United Nations in association with the State Planning Committee (SPC) of the Republic of Viet Nam estimated, however, that the privately and co-operatively-owned small-scale enterprises numbered in the thousands, while the State-owned medium- and large-scale enterprises numbered several hundred.[1/] Based on estimated output levels of the various components of the industry presented here in Table IV.1, this report also suggested that the non-State-owned enterprises accounted for 59 per cent of the total output of the agricultural processing industries. To the extent, moreover, that some of the large proportion of agricultural output categorized as "unprocessed or manually processed" is in fact processed by the privately or co-operatively-owned enterprises, this figure may even understate the true contribution of the non-State-owned enterprises.

No complete register of firms engaged in the processing of agricultural commodities exists. One register, covering State-owned firms operated by the central and provincial governments is maintained by the Ministry of Agriculture and Food Industry (MAFI), and lists 128 enterprises. This listing, which is reproduced here in Table IV.2, is incomplete even within its own relatively narrow terms of reference, however, with data being given only for the installed capacities of several industries rather than the number of establishments involved in each industry.

A similar paucity of data exists with regard to the contribution made by agricultural processing industries to employment creation. Some broad orders of magnitude are suggested, however, by the FAO/SPC report cited above. Noting official estimates of 110,000 full time workers in the State-owned enterprises and 600,000 full time workers in co-operatives in 1987, this report argues that employment levels in the privately-owned agricultural processing enterprises are likely to have been broadly similar to those in the co-operatively-owned part of the industry. The report therefore goes on to conclude that "it seems reasonable to estimate that approximately 1 million persons are employed in the agro-industrial sector and that up to 90 per cent are employed in small-scale processing activities".[2/]

The regional distribution of agricultural processing industries is very varied. A disproportionately large share of these industries is concentrated in the southern part of the country, where a multitude of predominantly small-scale privately or co-operatively-owned enterprises is engaged in the processing of the region's vast and varied output of agricultural products. Relatively small numbers of large-scale State-owned firms have also been established in this region, but they tend to be underutilized. By contrast, the bulk of the agricultural processing industry in northern Viet Nam consists of large-scale State-owned firms. The small-scale sector is relatively underdeveloped owing to the priority given by government planners to large-scale "socialist"

industrial development for several decades. Many of these enterprises also tend to be underutilized, and according to the FAO/SPC report cited above are often out of operation for one reason or another.[3/]

In line with the pre-eminence of rice production in Vietnamese agriculture, rice milling represents the most important agricultural processing activity in the country. This is underlined by the data in Tables IV.1 and IV.2, which show that rice milling accounted for the largest output of all agricultural processing industries and for the largest number of individual enterprises engaged in agricultural processing. Other major activities in this field include the milling of cane sugar, the manufacture of flours, starches and noodles, the commercial production of animal feed, and the processing of meat and fish. In addition, the production of beer, spirits and other alcoholic beverages, vegetable oils, dairy products and textile fibres also represent important components of the agricultural processing industries, as do the processing of fruit and vegetables, and locally grown cash crops such as coffee, rubber and tea.

Table IV.1. Estimated output of agricultural processing industries, 1988
(Thousand tonnes)

	Total output	Processed in central State-owned enterprises	Processed in provincial State-owned enterprises	Processed in private or co-operative enterprises	Unprocessed or manually processed
Rice (paddy)	16,600	315	3,122	5,265	7,898
Sugar-cane	5,535	835	1,392	3,309	...
Cassava	2,790	-	-	558	2,232
Animal feed	240+	40	200	...	...
Fish sauce	100+	-	-	100	-
Frozen fish	27	5	22	-	-
Dried fish	16	-	16	-	-
Fish meal	7+	-	7+	-	-
Canned fish	1	1	-	-	-
Slaughtered meat	129+	9	120	...	-
Frozen meat	11	9	2	-	-
Sausage meat	1+	-	1	...	...
Canned meat	2	2	-	-	-
Beer	98+	98	...	...	-
Spirits	17+	17	...	...	-
Ethanol	13+	13	...	...	-
Jute	56	...	...	...	-
Silk	<1	<1	...	...	-
Cotton	<1	-	<1	...	-
Vegetable oil	65	6	24	35	-
Rubber	50	-	-	-	-
Pineapples	427+	31	...	...	396[a/]
Bananas	1,151	5	...	...	1,146[b/]
Oranges	105	12	...	...	93[a/]
Sweetened condensed milk	52+	52	...	...	...
Coffee	50	20		30	-
Baked products	30+	...	...	...	...
Biscuits	26+	3	...	23	-
Confectionary	36+	3	...	33	-
Tea (dried)	28+	11	17	...	-
Wheat (imported)	30	30	-	-	-
Instant noodles	...	18	...	...	-
Weaning foods	4+	-	4+	...	-
Glutamate	2+	2+	...		-
Total	**27,698**	**1,537**	**4,927**	**9,444**	**11,765**

Source: R. S. Garven, *Agricultural and Food Production Sector Review - Viet Nam - Report of the Agro-Industrial Sector*, State Planning Committee and FAO, Rome, July 1989, page 9.

a/ Fresh.
b/ Fresh or processed.
\+ Indicates that present estimates may understate true output levels owing to incomplete data, especially in the co-operative and private sector.
< Indicates less than number stated.

Table IV.2. Number and performance of registered agricultural processing industries, 1987

Enterprises		Capacities (Tonnes/year)			Actual utilization (Percentage)	
Type	Number	Installed	Utilized	Max practical	of installed	of max practical
Rice milling	963	2,378,000				
Meat processing	10	50,000	20,000	40,000	40	50
Central	1	2,000	1,000	2,000	50	50
Local	9	48,000	19,000	38,000	40	50
Feather processing		2,000	1,500	2,000	75	75
Central		150	130	150	86	86
Local		1,850	1,370	1,850	74	74
Fruit/vegetable processing	13	45,000	32,000	41,000	71	78
Central	10	39,000	26,000	36,000	64	66
Local	3	6,000	6,000	5,000	100	120
Freezing/cooling plants	6	20,000	17,000	20,000	85	85
Central	2	6,000	4,500	6,000	75	75
Local	4	14,000	12,500	14,000	89	89
Drying	50	6,000	4,000	5,000	67	80
Sugar factories						
Central	6	9,000	4,500	7,200	50	63
Local	4	2,000	1,000	1,600	50	63
Glucose processing	1	2,000	1,400	2,000	70	70
Alcohol	3	23	18	22	80	81
Beer	2	140	85	105	61	81
Other beverages	1	50	16	30	32	53
Confectionary manufacturing						
Central	1	6,000	2,500	4,500	42	55
Local		15,000	10,000	13,000	67	77
Coconut oil		50,000	22,000	40,000	44	55
Peanut oil		5,000	4,000	5,000	80	80
Coffee processing		300	70	300	23	23
Milk processing (million cans)	2	175	45	70	26	64
Monosodium glutamate		3,000	2,200	2,500	73	88
Animal feed processing						
Central		80,000	40,000	70,000	50	57
Local		400,000	200,000	350,000	50	57
Silkworm		180	100	135	56	74
Jute		160	90	120	56	75
Cotton (tonnes of seed)		5,000	1,000	3,000	20	33

Source: Ministry of Agriculture and Food Industries, as cited in United Nations Industrial Development Organization, *Viet Nam's Industrial Development - An Assessment*, Report by the Regional and Country Studies Branch, Industrial Policy and Perspectives Division, UNIDO, Vienna, August 1989, pages 179-180.

Rice milling

The resource base

Rice is the principal food and main agricultural crop produced in Viet Nam, and accounts for more than 80 per cent of the total land area devoted to food production. It is cultivated most extensively in the southern part of the country in the Mekong delta, which has historically constituted the "rice bowl" of Viet Nam. The second most important region of rice cultivation is the delta of the Songkoi-Songbo-Songma river system in northern Viet Nam. This region, also known as the Red River delta, owes much of its expansion to the post-World War II partition of the country, which forced the Government of North Viet Nam to develop the local food resources of what had previously been a food deficit area dependent on supplies from the south. These two deltas account for approximately 60 per cent of the total land area planted to rice in Viet Nam. Much of this other land under rice is less than optimally suited to rice production, however, and both yields and output levels in these regions are significantly lower than in the two deltas.

For historical reasons, the structural and institutional framework of rice cultivation differs significantly between the Mekong delta and the Red River delta. Despite early efforts at collectivization and co-operativization in the immediate aftermath of Viet Nam's reunification and re-integration in 1975-76, rice production in the Mekong delta has continued to be dominated by small-scale privately-owned family farms. As indicated in Chapter I, moreover, the role of the private sector has been reinforced in recent years by a variety of economic policy measures aimed at promoting private incentives to increase food production. In the north, on the other hand, most rice growing peasants have long been organized into producer co-operatives, although even here the co-operativized farmers were permitted to cultivate private plots, the combined area of which was not allowed to exceed 5 per cent of the total land area of their co-operatives. In practice, however, the privately operated area frequently exceeded the officially permitted 5 per cent share of the co-operative's total acreage.

Although rice production has increased rapidly in recent years, from less than 16 million tonnes in 1985 to more than 21 million tonnes in 1989, considerable scope for expansion still remains. The "Green Revolution" methods of intensive cultivation remain largely unknown and untried in Viet Nam, where rice production continues to rely largely on traditional techniques. The latest available estimates thus indicate that only about three quarters of Viet Nam's rice acreage was under some form of irrigation in 1987[4/], and that only about half of all rice acreage was double cropped in that year.[5/]. As shown in Annex Table A-12, moreover, the recorded cropping intensity varied considerably from region to region, largely in response to water availability. As indicated further in Annex Table A-13, yields per ha remain relatively low at approximately 3 tonnes/ha, which compares with Indonesian yields of almost 4.3 tonnes/ha. Annex Table A-13 also highlights the seasonal nature of rice production, and hence the problems of ensuring an optimal year-round utilization of rice milling capacity.

Recent industrial trends

The caveat about data limitations entered in the general discussion above is particularly relevant with regard to rice milling. Official statistics on rice milling tend to be restricted only to the activities of State-owned mills operated either by the central government or by local governments. According to the most recent estimates available, the total number of these State-owned rice mills amounted to 963 in 1987-88. Of these, seven were large-scale facilities owned by the central government, which had milling capacities of more than three tonnes/hour. The remainder were medium- and small-scale enterprises operated by local governments, of which the former had capacities of 1-3 tonnes/hour and 6-20 tonnes/day, and the latter had capacities of less than one tonne/hour and 5 tonnes/day. Estimates of the total processing capacity of these mills varies, however, from less than 2.4 million tonnes to more than 3.4 million tonnes. As indicated in Table IV.2, a UNIDO mission visiting Viet Nam in the late 1980s was thus informed that the total installed capacity of the State-owned rice mills amounted to 2.378 million tonnes, while the findings of an FAO mission reproduced here in Table IV.3 indicate that the actual volume of paddy processed in 1988 amounted to 3.437 million tonnes. The apparent inconsistency may be reconciled by the fact that throughput in Vietnamese industrial enterprises often exceeds designed capacity as these enterprises are operated for longer hours than they have been designed for.

Table IV.3. Estimated output of milled rice by type of facility, 1988

	Number of mills	Output ('000 tonnes)	Average output per shift[a/] (tonnes)	Scale of enterprises
State-owned (central)[b/]	7	315	150	Large
State- owned (local)[b/]	956	3,122	11	Medium/Small
Co-operative and private	±15,000	to 8,163	2-3	Small
Household level	...	to 7,897	...	Manual
Total	...	16,600		

Source: R. S. Garven, *Agricultural and Food Production Sector Review - Viet Nam - Report of the Agro-Industrial Sector*, State Planning Committee and FAO, Rome, July 1989, pages 12-13.

a/ Assumes a shift operates for six continuous hours per day for 300 days per year.
b/ 1985 data.

Since total Vietnamese rice output exceeds both the installed and utilized capacity levels described above by a considerable margin, it is evident that the vast bulk of Vietnamese rice production is processed outside the State-owned mills. While estimates vary in the absence of any firm data, it is generally believed that some 70-80 per cent of the paddy grown in Viet Nam is processed in small mills operated co-operatively or privately. The FAO estimates presented in Table IV.3 thus suggest that some 15,000 small-scale rice milling enterprises are in operation in Viet Nam, and that they processed between 5.3 million and 8.2 million tonnes of paddy in 1988. A further 5.0-7.9 million tonnes are estimated by the compilers of this table to have been processed manually, mainly by hand pounding, at the household level.

The processing technology employed by the Vietnamese rice milling industry spans a considerable range. According to official Vietnamese estimates, some 95 per cent of the small-scale mills located in the northern part of the country consist of cast iron hullers of the Engleberg type, which use obsolete technology and have a capacity 0.4 tonnes/hour. The remaining 5 per cent of the northern small-scale mills use rubber roll shellers to remove the husk. In southern Viet Nam, many small- and medium-sized rice mills employ the under runner disc huller technique, and use disc huskers and vertical cone whiteners with a capacity of 0.6 tonnes/hour. Most of the newer mills used in southern Viet Nam consist of Satake type mini-mills with a production capacity of approximately 0.6 tonnes/hour.

Viet Nam is able to supply some of its milling equipment needs from its own production. The State-owned Hoang Liet Factory in Hanoi, which has received assistance from UNDP/UNIDO (VIE/82/004) for design, manufacture, repair and maintenance capabilities, manufactures Engleberg type mills and rubber roll shellers. A set of rubber rolls produced by this factory is claimed to have an effective working life of 100 hours, which exceeds the 17 hour working life of comparable rubber rolls manufactured in the Philippines by a factor of almost 6 but falls well short of the 200 hour working life of Japanese-made rollers. The Food Equipment Manufacturing Factory II in Ho Chi Minh City produces spare parts for the disc huller mills used in southern Viet Nam. The larger and medium-sized mills are reported to be getting old, however, with the mechanical installations being poorly maintained and becoming worn out. Spare parts are often in short supply, and only the most essential of these are made in local workshops.

Major constraints

The estimated recovery rates of the Vietnamese rice milling industry are presented in Annex Tables A-14 and A-15. These range from approximately 50 per cent to approximately 70 per cent, and are broadly comparable to those of other tropical rice producing countries such as Thailand, Indonesia, India and Bangladesh. Vietnamese spokesmen have noted, however, that these recovery rates could be raised by at least 1.5-3.0 per cent if the obsolescent milling technology currently in use in the country were modernized. According to official estimates, an increase in milling recovery rates of this magnitude would enable an additional 200,000-300,000 tonnes of milled rice to become available for Vietnamese consumers.[6/]

Based on this assessment, the need for an extensive rehabilitation and modernization of Viet Nam's rice milling industry has been widely recognized. This is especially true in the case of the small-scale component of the industry, which appears to be particularly inefficient and, as shown in Annex Table A-15, boasts the lowest milling recovery rate in the country. The need to raise the efficiency of this part of the industry is reinforced, moreover, by the fact that it is likely to experience the most rapid expansion in the coming years as the trend towards mechanized milling will prompt an increasing shift from the high yielding technique of hand pounding towards the use of small-scale milling technology, and as a continued expansion of demand for food promotes a corresponding increase in small-scale rice milling capacity.

This need to rehabilitate existing mills and establish a network of new efficient small-scale mills was acknowledged by the United Nations agencies from an early stage. One of the earliest consultants' reports commissioned by these agencies therefore recommended that "Viet Nam, with technical assistance from UNDP, should embark on a major small-scale rice mill rehabilitation programme." It argued further that "this will involve strengthening the existing equipment manufacturing industry", and suggested that "a tax incentive scheme may be necessary to help implement the conversion to improved milling technology and improved yields". It also recommended that future activities by the UNDP and FAO in support of the Vietnamese rice milling industry should be directed towards small-scale rice mills.[7/]

In the context of the formulation and implementation of such a small-scale rice mill rehabilitation programme, five specific measures have been recommended. These consist of accurate current assessment, programme development, equipment manufacturing, programme promotion and on-going monitoring. The first of these calls for the compilation of a precise inventory of the Vietnamese rice milling industry, and for the quantification of the potential increase in the milling recovery rate which would allow reasonably accurate estimates of the economic benefits of rice mill modernization to be determined. The second measure calls for Viet Nam and the UNDP to develop a comprehensive systematic plan to modernize the rice milling industry, with specific emphasis being placed on its small-scale branch. The third measure calls for an enhancement of local equipment manufacturing capacity, either through licensing arrangements with countries possessing the appropriate technology or through the local development of the required technology with technical assistance from such agencies as UNIDO and the ILO. The fourth measure calls for the provision of tax incentives to stimulate the adoption of new technology at both the rice milling and equipment manufacturing levels. The fifth and final measure calls for a continuous monitoring of the programme in order to be able to rectify any errors immediately.[8/]

Prospects

Projections produced by UNIDO have suggested that a substantial increase in installed rice milling capacity is necessary in order to meet the growing food requirements of the Vietnamese population over the coming 15 years. These projections therefore argue the need for a comprehensive overhaul of the existing industry, including the 7 large-scale State-owned mills operated by the central government as well as all of the other smaller mills operated by the local governments and by co-operatives and private interests. In addition, these projections foresee a significant expansion of rice milling, with the construction of 200 new small-scale mills with an average output of 10 tonnes/shift and the construction of 45 new large-scale mills with an average capacity of 600 tonnes/day. As a result of these investments in the industry, total Vietnamese rice milling capacity is projected to rise from 19 million tonnes/year in 1990 to 26 million tonnes/year by 2000. This is illustrated in greater detail in Table IV.4.

Table IV.4. Projected rehabilitation and expansion of rice milling industry, 1990-2005

	1990	1995	2000	2005
Rehabilitation of existing large-scale mills	yes	yes	yes	
Construction of 200 new small-scale mills[a/]	yes	yes	yes	yes
Construction of new large-scale mills	7	13	25	
Total capacity	19.0	21.0	26.0	
Small and medium scale[b/]	15.6	16.8	20.8	
Large scale[c/]	3.4	4.2	5.2	

Source: Ministry of Agriculture and Food Industries, as cited in United Nations Industrial Development Organization, *Viet Nam's Industrial Development - An Assessment*, Report by the Regional and Country Studies Branch, Industrial Policy and Perspectives Division, UNIDO, Vienna, August 1989, page 90.

a/ Average capacity = 10 tons/shift
b/ Operated by provincial governments as well as co-operate and private enterprises.
c/ Operated by central government.

The rehabilitation of the existing rice mills should also focus on the quality performance of the equipment installed, which in the case of small-scale mills currently results in the production of rice with a comparatively high proportion of broken grains of approximately 30-40 per cent as well as considerable processing losses. According to assessments made by the UNDP/FAO Post-Harvest Protection Project (VIE/86/012/A/01/12), the overall milling recovery rate is expected to increase by 10-20 per cent after the comprehensive rehabilitation of existing mills. For Viet Nam as a whole, this has been calculated to result in an annual saving of some 2 million tonnes of rice per year for human consumption. Head rice recovery is expected to increase by 3-5 per cent, and final mill output is expected to rise by a minimum of 15 per cent

Storage facilities for paddy are reported to be adequate for the present levels of production, but the quality standard is believed to be relatively low. The UNDP/FAO post-harvest protection project also covers this issue, as well as the establishment of an appropriate pricing mechanism for rice in the Vietnamese economy. This project is therefore expected to result in a substantial increase in the efficiency of rice handling in Viet Nam.

The rehabilitation of existing rice mills, the manufacture of new equipment for both large-scale and small-scale mills, the very strong need for spare parts in the future and the periodic need for expert maintenance services to the rice mills provides a substantial basis for industrial development in the steel manufacturing subsector. Such a programme could be implemented in several ways. One possibility involves the signing of licensing agreements with overseas owners of appropriate technology, under which the foreign partner provides both training and technical assistance. Another possibility is given by joint ventures, where the foreign partner supplies certain qualified components according to predetermined principles of costing and subsequent pricing of the final equipment.

Sugar-cane processing

The resource base

Sugar-cane is widely grown throughout Viet Nam, although more than 80 per cent of the acreage planted to this crop is in the south of the country, and especially in the Mekong delta, towards the east of Ho Chi Minh City, and in the central coastal provinces. Sugar-cane acreage expanded rapidly in the late 1970s and early 1980s, but has stabilized in subsequent years. As shown in Table IV.5, average cane yields in Viet Nam have remained virtually unchanged at approximately 40 tonnes/ha during the 1980s, and are among the lowest in Asia. This average conceals a considerable spread, however, and yields in some areas of the Mekong delta are said to approach or exceed the levels of 45-50 tonnes/ha achieved in neighbouring countries. Even so, Vietnamese sugar-cane yields fall well below those of the major sugar-cane producing countries, which range from 70 to 100 tonnes/ha.

Table IV.5. Area, production and yields of sugar-cane, 1980-1995

	1980	1985	1988[a/]	1990[b/]	1995[b/]
Production ('000 tonnes)	4,359	5,560	5,535	10,010	12,500
Area ('000 hectare)	110	143	140	220	250
Yield (tonnes/hectare)	39.7	38.9	39.6	45.5	50.0

Source: State Planning Committee, Socialist Republic of Viet Nam, and United Nations Development Programme, Food and Agriculture Organization of the United Nations, and the World Bank, *Viet Nam - Agricultural and Food Production Sector Review*, Draft Mission Report DD:DP/VIE/88/033, nd, p. 72.

a/ Estimate.

b/ Projection.

The reasons for the low yields include an almost total lack of fertilizer use and the fact that sugar-cane is most often grown on marginal land in hilly or poorly drained areas with little or no irrigation. Environmental conditions in northern Viet Nam, which include low winter temperatures, insufficient hours of sunlight, and the frequent incidence of typhoon and flood damage, also limit the scope for yield increases. These problems are compounded by the use of inferior plant varieties, with the most common variety in use being an old Indonesian variety, POJ, which was introduced into Viet Nam some 30-40 years ago. Over a past few years, however, a new variety, F 134, has been introduced from Taiwan Province. Even though this has a lower sugar content than POJ, its yields are twice as high and it is therefore becoming increasingly popular with Vietnamese cultivators.

Despite a gradual improvement resulting from the increasing adoption of new plant varieties in recent years, the average quality of Viet Nam's sugar-cane production remains relatively low. One recent study has noted, for example, that the sugar-cane delivered to mills in northern Viet Nam during 1985-87 had a commercial cane sugar (CCS) content of 9-10 per cent, and a mixed juice purity of 72-75 per cent. The sugar-cane processed by the Van Diem Sugar Mill during this period had an average CCS content of 9.46 per cent, with none of the cane brought to this mill having a CCS content of more than 10 per cent.[9/] The problems of poor cane quality are often exacerbated, moreover, by long procurement distances and organizational inefficiencies in the delivery of cane to the mills, which result in a further reduction of sugar content.

The State Planning Committee of Viet Nam is giving a high priority to the expansion of sugar-cane production, especially in the north of the country. As shown in Table IV.5, it expects a dramatic increase in acreage, yields and output levels over the coming years. This expansion is expected to be concentrated in the northern region in order to enable a more extensive utilization of the existing processing capacity in that part of the country. To promote the required expansion of sugar-cane planting, the government has

pursued a relatively flexible pricing policy in recent years, which has resulted in a significant improvement in the domestic terms of trade for sugar, with 8-10 tonnes of sugar-cane now exchanging for a tonne of paddy. Despite the provision of this comparatively favourable set of price relatives, however, the official output growth projections presented in Table IV.5 appear somewhat optimistic, and several problems remain. In particular, it has been argued that "in the final analysis, geographic imbalance of processing capacity is the most serious limitation on expansion of production",[10] since sugar-cane is too heavy and bulky a commodity to be easily transported for long distances between the farm gate and the mill door, and since lengthy delays in transport can, as indicated above, result in a loss of the cane's sugar content.

Recent industrial trends

The sugar-cane processing industry in Viet Nam has a similar ownership and management structure as the rice milling industry. It consists of both State-owned and co-operatively or privately-owned enterprises, with the former being operated either by the central government or by local provincial or district governments. The centrally controlled enterprises, which are administered by the Ministry of Agriculture and Food Industries (MAFI), are combined into two "unions". As indicated in Table IV.6, the Union of Sugar Mills No 1 covers the northern region of the country and includes two sugar mills, while the Union of Sugar Mills No 2, covers the southern region and includes four mills. These six relatively large-scale mills have a combined production capacity of approximately 9,000 tonnes/day. As also shown in Table IV.6, an additional five medium-scale mills with a joint capacity of 2,100 tonnes/day are operated by local governments. Although the State-owned sugar processing industry thus comprises a total designed capacity of 11,100 tonnes/day, a recent UNIDO mission has estimated that the maximum practical capacity of the industry amounts to no more than 8,600 tonnes/day owing to a variety of operational deficiencies.[11]

Table IV.6. Organizational structure and capacity of State-owned sugar milling industry

	Province	Region	Designed capacity (tonnes/day)
Centrally controlled			
Union of Sugar Mills No 1			
Van Diem Sugar Mill	Ha Son Binh	Northern	1,000
Lam Son Sugar Mill	Thanh Hoa	Northern	1,500
Union of Sugar Mills No 2			
Quang Ngai Sugar Mill	Nghia Binh	Southern	1,500
Hiep Hoa Sugar Mill	Long An	Southern	1,500
Binh Duon Sugar Mill	Song Be	Southern	1,500
La Nga Sugar Mill	Dong Hai	Southern	2,000
Total			9,000
Provincially controlled			
Viet Tri Sugar Mill	Vinh Phu	Northern	500
Viet Tru Sugar Mill	Ha Nam Ninh	Northern	500
Song Lam Sugar Mill	Nghe Tinh	Central	500
Thap Cham Sugar Mill	Thuan Hai	Southern	300
Mo Cay Sugar Mill	Ben Tre	Southern	300
Total			2,100
Grand Total			**11,100**

Source: R. S. Garven, *Agricultural and Food Production Sector Review - Viet Nam - Report of the Agro-Industrial Sector*, State Planning Committee and FAO, Rome, July 1989, pages 19-20.

The refined sugar produced by the State-owned enterprises accounts for only about 25 per cent of total domestic demand, with the remainder being provided by a multitude of small co-operatively and privately-owned sugar crushing plants and household extraction units. Although no precise data on the number and scale of these enterprises is available, official Vietnamese sources have suggested that some 6,000 small-scale presses were in operation in the northern region in 1987/88, each with a capacity of 1-2 tonnes/day of sugar-cane. Based on the regional distribution of sugar-cane production within Viet Nam, a consultant of the Food and Agricultural Organization of the United Nations has estimated that approximately ten times as many small-scale extraction units are likely to have been operating in the central and southern parts of the country at that time.[12]

Major constraints

The sugar processing facilities in Viet Nam are generally of simple design and rugged construction, and appear to work without major disturbances. Their operating efficiency is relatively low, however, and much of the equipment tends to be very old and in a poor state of repair. The State-owned enterprises are also frequently overstaffed, with the firms' managers feeling obliged to carry an unnecessarily large work force for reasons of social responsibility. These enterprises are also required to place high priority on the achievement of quantitative production targets, often at the expense of product quality.

Estimates of the rate of sugar recovery vary, but a representative set is presented in Annex Table A-16. For a given volume of cane processed, these data indicate extraction rates for refined sugar of 6 per cent in the large- and medium-scale State-owned enterprises and 4.5 per cent in the small-scale mills. Assuming that the sugar-cane processed by these enterprises has a CCS content of approximately 10 per cent, these estimates show that the State-owned and non-State-owned mills are losing 40 per cent and 55 per cent respectively of the recoverable sugar contained in the cane delivered to them. While expectations of extracting the total available volume of sugar may be illusory, the existing situation does nevertheless leave considerable scope for improvement.

As shown in Table IV.7, even a relatively small further improvement in extraction rates would result in a substantial increase in overall sugar production levels in Viet Nam. An increase in the recovery factor to 8.5 per cent in the State-owned sugar mills and 6 per cent in the remainder of the cane processing industry would thus increase the total volume of sugar production in Viet Nam by almost 33 per cent from 320,835 tonnes to 426,127 tonnes. To achieve part or all of this potential, however, a major rehabilitation of Vietnamese sugar mills will be necessary.

Table IV.7. Impact of improved sugar processing facilities on sugar output

	Cane input (Tonnes)	Potential increase in recovery (Percentage)	Potential increase in output (Tonnes)
Centrally owned	834,930	2.5	20,873
Provincially owned	1,391,550	2.5	34,789
Small scale	3,308,690	1.5	49,630
Total	**5,535,170**		**105,292**

Source: R. S. Garven, *Agricultural and Food Production Sector Review - Viet Nam - Report of the Agro-Industrial Sector*, State Planning Committee and FAO, Rome, July 1989, page 48.

Such a rehabilitation of Viet Nam's sugar processing facilities would have several important benefits. One of the most important of these would be a reduction, if not a cessation, of Viet Nam's traditionally large and costly sugar imports. In 1987, Viet Nam was thus reported to have imported 96,000 tonnes of refined cane sugar, well below the increase in production levels that would have been achieved if the country's domestic sugar industry had been in a better state of repairs and achieved the higher extraction rates of 8.5 per cent and 6 per cent discussed above. In addition, the proposed rehabilitation of the sugar processing industry would provide a significant boost to local equipment manufacturers and the light manufacturing sector in general.

The general requirements for the successful implementation of a programme to expand and modernize Viet Nam's sugar processing capacity are broadly similar to those for the rice mill rehabilitation programme described above. They include the need to undertake an accurate assessment of the current state of the industry in order to enable a precise calculation of the potential gains of the rehabilitation programme. They also include the need to develop a comprehensive and systematic plan to modernize the sugar processing

industry, with the possible assistance of such international agencies as the United Nations Development Programme (UNDP), and the need to enhance local equipment manufacturing capacity through appropriate measures of technology transfer and worker training, possibly with the assistance of UNIDO or the International Labour Organization (ILO). Finally, they include the need to promote the adoption of the chosen programme by local sugar processors through the provision of price and tax incentives, and the need to monitor the performance of the programme continuously in order to correct any unforeseen errors.

Prospects

Based on the expected growth of domestic consumer demand and the hope of developing refined sugar as an important export commodity, the Ministry of Agriculture and Food Industry projects a substantial expansion of the Vietnamese sugar processing industry in the foreseeable future. Between 1990 and 2005, the total quantity of industrially produced sugar and molasses is thus expected to increase from 600,000 tonnes to 1.5 million tonnes. This increase in quantity is to be accompanied, moreover, by a significant improvement in the quality of the sugar produced in Viet Nam.

To correct some of the underlying shortcomings of the sugar industry, priority is expected to be given to the establishment of a stable raw material supply for the processing plants and the introduction of a system of quality related payments for suppliers based on the sugar content of the cane delivered to the mills and the time of delivery. In addition, the domestic manufacture and supply of spare parts to the mills is also expected to be improved in order to ensure their optimal operation, and measures are expected to be taken to improve the recovery rate in both industrial and non-industrial processing facilities. In the absence of such measures, it has been estimated that the volume of sugar lost in bagasse could rise to 400,000 tonnes per annum in the next 10-15 years.

The achievement of the projected growth in production of refined sugar will also require substantial investments in the maintenance of existing processing facilities and the construction of new mills. According to data provided by the Vietnamese authorities to UNIDO, the projected investment programme for the sugar processing industry has three main dimensions. The first of these will involve investments in the existing State-owned factories to permit production to be maintained at or near the designed capacity of 11,000 tonnes/day until year 2005 and beyond. The second involves the establishment of ten new factories with a total capacity of 15,000 tonnes/day by 1995. The third proposes the construction of a further 36 plants by year 2005, when total national capacity for industrially refined sugar is projected to rise to 35,000 tonnes/day. These figures imply that the plants installed between 1995 and 2005 will be smaller than those established in earlier years, and that some of the old factories currently in operation may possibly be phased out in the opening years of the next century.

Flours, starches and noodles

The resource base and recent industrial trends

Although it is not very well documented because it is conducted principally on a small scale at village level, the production of flours, starches and noodles from roots, tubers and cereals is believed to be the third most important agricultural processing activity in Viet Nam. Rice, cassava, sweet potatoes and arrowroot (cana) form the prime ingredients of much of this activity, which utilizes a variety of techniques to mill these crops into flours or extract their starch for food or industrial use. Broadly speaking, human consumption accounts for at least as important a share of the flours and starches derived from roots and tubers as animal feed or industrial uses, although this often reflects local food deficits and transport constraints rather than consumer preferences.

As shown in Table IV.8, cassava and sweet potatoes occupied 316,000 and 319,000 ha respectively in 1988, although both the area planted and the total volume of output had declined substantially since the beginning of the decade. Production of both of these crops is concentrated primarily in the north-central and central-coastal provinces of Viet Nam, which account for more than one third of the country's total area under cassava and one half of the total area planted to sweet potatoes. In addition, cassava is also important in the northern mountains, where it is grown mainly under shifting cultivation in association with maize and upland rice, and to the east of Ho Chi Minh City.

Table IV.8. Area, production and yields of cassava and sweet potatoes, 1980-1995

	1980	1985	1988	1990[a/]	1995[a/]
Cassava					
Production ('000 tonnes)	3,323	2,939	2,882	2,880	3,200
Area ('000 hectare)	443	335	318	320	320
Yield (tonnes/hectare)	7.5	8.8	8.9	9.0	10.0
Sweet potatoes					
Production ('000 tonnes)	2,418	1,773	1,902	2,113	2,805
Area ('000 hectare)	450	319	336	325	330
Yield (tonnes/hectare)	5.4	5.6	5.7	6.5	8.5

Source: State Planning Committee, Socialist Republic of Viet Nam, and United Nations Development Programme, Food and Agriculture Organization of the United Nations, and the World Bank, *Viet Nam - Agricultural and Food Production Sector Review*, Draft Mission Report DD:DP/VIE/88/033, nd, page 66; Socialist Republic of Viet Nam, General Statistical Office, *Statistical Data of the Socialist Republic of Vietnam, 1976-1989*, Statistical Publishing House, Hanoi, 1990, pages 32-34.

a/ Projection.

Cassava is frequently dried on roadways and then ground into flour for food or cattle fodder. Alternatively, fresh cassava may be ground in a co-operatively-owned grinder, and the wet slurry brought back to the household where the starch is separated from the non-starch components. The starch may then be processed further into noodles, which are dried on bamboo boards along the roadside. Arrowroot is processed in a similar way. Sweet potatoes, finally, may also be dried along the road and then ground into flour, or may be sliced, dried, and converted to starch.

Major constraints and prospects

A crucial constraint inhibiting the expansion of the flour, starch and noodle industries in their present form is their widespread dispersal and the essentially artisanal nature in which they are conducted. At the same time, however, there is considerable scope for a development of these industries through the adoption of new production technologies and an increased commercialization of the production process. In order to facilitate such a shift towards more large-scale methods of production, moreover, the Vietnamese planners are seeking to reverse the long-term decline in the output of the basic agricultural raw materials of these industries as indicated in Table IV.8. Largely as a result of substantial yield increases, the State Planning Commission is thus anticipating significant increases in the output of both cassava and sweet potatoes over the coming years. Whether or not such an increase in production will provoke a structural shift in the pattern of flour, starch and noodle production of the kind described above, it will certainly support a further expansion of the existing rural industries, especially in some coastal areas and in the northern mountains.

Fruit and vegetable processing

The resource base

Viet Nam's diversity of climatic and soil conditions enable it to produce an extensive range of fruits, vegetables and spices which could be processed further both for consumption in the domestic market and, especially, for export. Fruits are particularly important in this context, and Viet Nam is well situated to produce a number of high value tropical fruits including pineapples, bananas, guavas, mangoes and lychees, as well as several varieties of citrus fruit (mandarins, oranges, grapefruits and lemons). Although the cultivation of these fruits is spread throughout the country, particularly high concentrations are found in the Mekong delta, in the region to the north-east of Ho Chi Minh City, and in some parts of the north-central provinces. Apart from fruits, several vegetables and spices (including potatoes, cucumbers, cabbages, garlic, ginger and black pepper) produced in Viet Nam are also capable of further processing on an industrial scale.

As shown in Table IV.9, fruit production has expanded significantly during the 1980s, with output of all fruits rising from 1.59 million tonnes in 1980 to an estimated 1.68 million tonnes in 1988. Particularly strong growth has been recorded by pineapple production, which increased by 22 per cent from 350,000 tonnes in 1980 to 427,000 tonnes in 1988. The production performance of other fruits was marred by a substantial downturn between 1985 and 1988, but the 1988 production estimates nevertheless represent a creditable increase over the 1980 output data presented in Table IV.9.

Recent industrial trends

The Vietnamese fruit and vegetable processing industry is largely State-owned. The central government, through the Ministry of Agriculture and Food Industry (MAFI), controls a commercial company, the Vegetable Export Company (Vegexco), which is charged with the following principal tasks:

- To operate and manage a number of State-owned farms which cultivate a variety of fruits, including pineapples, oranges and bananas.
- To procure and export fresh and processed fruit and vegetables from farms owned by the central and provincial governments.
- To manage several canning and freezing factories. At present these comprise nine canning factories with a designed capacity of 40,000 tonnes/year, five freezing factories with a designed capacity of 12,000 tonnes/year, and a research centre for the production of canned foods.

In addition, several local governments also operate fruit farms and processing facilities, of which the Pineapple Export Company (Pinexco) operated by the government of Ho Chi Minh City is often cited as a typical example.

The total number of fruit and vegetable processing plants currently in operation in Viet Nam is estimated at 13, with a total capacity of approximately 45,000 tonnes/year of mainly canned and frozen products. The industry is highly labour intensive, and to a large and increasing degree oriented towards exports. An quantitative indication of Viet Nam's fruit and vegetable exports is given in Table IV.10. The country's principal export markets have traditionally been the Soviet Union and the formerly socialist countries of eastern Europe, although relatively small quantities have also been exported to Japan, Singapore and France in the recent past.

Major constraints

To the extent that the growth prospects of the Vietnamese fruit and vegetable processing industry will continue to be determined primarily by external demand, its expansion is likely to be inhibited by the relatively poor quality of its product. A recent UNIDO mission to Viet Nam thus reported that the quality of the food processing industry is not uniform and falls short of the standard expected by international consumers. It also noted that the hygienic conditions and working environment are invariably of low standard, and that the packaging employed in the country is often simple and sometimes inadequate.[13/] As against this unflattering assessment, one recent observer has nevertheless argued that "the quality of management and sanitation can be very good at some MAFI facilities". In particular, he cited a MAFI-owned pineapple canning and freezing factory in Ho Chi Minh City as "an example of a successful State facility which has a good opportunity to export processed fruit juices and canned fruit to convertible currency markets".[14/]

Table IV.9. Area, production and yields of fruits, 1980-1995

	1980	1985	1988[a]	1990[b]	1995[b]
Total					
Production ('000 tonnes)	1,586	1,723	1,683	2,030	2,896
Area ('000 hectare)	138	129	142	129	132
Yield (tonnes/hectare)	11.5	13.4	11.9	15.7	21.9
Pineapples					
Production ('000 tonnes)	350	363	427	450	720
Area ('000 hectare)	43	35	43	34	35
Yield (tonnes/hectare)	8.1	10.4	9.9	13.2	20.6
Bananas					
Production ('000 tonnes)	1,136	1,249	1,151	1,440	2,000
Area ('000 hectare)	79	77	83	78	79
Yield (tonnes/hectare)	14.4	16.2	13.9	18.5	25.3
Citrus and other fruits					
Production ('000 tonnes)	100	111	105	140	176
Area ('000 hectare)	16	17	16	17	18
Yield (tonnes/hectare)	7.5	7.9	7.5	8.0	9.0

Source: State Planning Committee, Socialist Republic of Viet Nam, and United Nations Development Programme, Food and Agriculture Organization of the United Nations, and the World Bank, *Viet Nam - Agricultural and Food Production Sector Review*, Draft Mission Report DD:DP/VIE/88/033, nd, page 82.

a/ Estimate.
b/ Projection.

Table IV.10. Production and exports of fruits, vegetables and spices
(Thousand tonnes)

	Production	Exports (Fresh)	Exports (Processed)
Fresh vegetables	2,939.0	8.0	-
Bananas	1,151.2	20.0	4.7
Pineapples	426.7	5.0	-
Frozen	-	-	17.5
Canned	-	-	21.0
Citrus fruits	105.3	10.0	...
Onions	...	1.5	-
Irish potatoes	...	11.8	-
Garlic	...	2.4	-
Watermelons	...	11.3	-
Black pepper	...	0.5	-

Source: R. S. Garven, *Agricultural and Food Production Sector Review - Viet Nam - Report of the Agro-Industrial Sector*, State Planning Committee and FAO, Rome, July 1989, page 27.

In general terms, however, it is widely acknowledged that the quality of Viet Nam's processed fruit and vegetable exports has considerable potential for improvement. These quality constraints have indeed played a major role in limiting Viet Nam's exports to Soviet and eastern European markets, which impose lower quality standards on their suppliers than the markets of the major western industrialized countries. Several reasons suggest themselves for these quality problems. These include a lack of modern equipment, which has forced the Vietnamese processing facilities to adopt obsolete and highly labour-intensive technology. This, in turn, reduces the scope for standardization of the output at an established and generally recognized quality level. The problem is exacerbated, moreover, by the uneven quality of the raw materials used by these processing facilities, as the prevailing institutional framework and pricing structures give cultivators of fruits and vegetables no incentives to provide regular and timely deliveries of high quality products for further processing.

Prospects

Over the longer term, the future development of the Vietnamese fruit and vegetable processing industry will depend largely on its ability to raise the quality of its output. At one level, this will necessitate an upgrading of its processing facilities and the introduction of modern technology, which itself will result in a substantial reduction in the industry's labour intensity in due course. At another level, it will also necessitate measures to ensure the delivery of high quality fresh fruits and vegetables to the processing plants. The processing industry itself will increasingly have to adopt a direct role in promoting the supply of first class raw materials by helping growers to choose appropriate plant varieties, disseminating improved cultivation practices, and establishing an incentive-based pricing structure.

While the longer term expansion of the fruit and vegetable processing industry thus clearly depends on an increased degree of commercialization, modernization and quality consciousness, any attempt to diversify Viet Nam's existing export markets with other more sophisticated markets may only be feasible in the medium to long term. These markets should be added to rather than replaced in due course as the Vietnamese industry begins to produce goods which have a wider geographic appeal. The main steps that the industry will need to take to broaden its appeal will be to produce top quality products at competitive prices for timely delivery. The Ministry of Agriculture and Food Industries (MAFI) has projected a significant expansion of the fruit and vegetable processing industry in the coming years, with total output rising to 100,000 tonnes/year by 2005. At the same time however, decisions on such complex issues as the firms'

ultimate processing capacity and product range will have to be based on case by case assessments to identify areas of production, costs of production, and the types of raw materials used.

Processing of perennial tree crops

The resource base

The geographical and climatological environment of Viet Nam is well suited for the production of a large number of industrial tree crops, of which rubber, coffee, tea and coconut are the most important. Significant efforts have been made since the mid-1970s to exploit this potential, especially in the previously underutilized upland areas, and a considerable rehabilitation and expansion of acreage planted to these crops has been undertaken during the past 15 years with the financial assistance of the CMEA countries. Much of this growth has been generated by State-owned farms or by the government's land reclamation policies involving the settlement of shifting highland cultivators into a sedentary way of life and a resettlement of people from the densely populated lowland regions to the highlands.

As a result of the tree crop expansion programme of the past decade, the area planted to rubber, coffee, tea and coconut increased at an annual average rate of 8 per cent, 17 per cent, 3 per cent, and 15 per cent respectively between 1976 and 1988. Output growth failed in most cases to match this growth in planted area, however, and amounted to an average of 5 per cent, 11 per cent, 5 per cent and 14 per cent per year respectively, largely because of the normal lags between the planting of such crops and their reaching maturity. As shown in Table IV.11, a substantial further growth of both planted area and output is projected for the coming years.

Industrial tree crop plantations are concentrated in a relatively small number of areas in Viet Nam. More than 40 per cent of the total acreage under such crops is located to the north-east of Ho Chi Minh City, where rubber and coffee are the main products. The central highlands, which support plantations of all major tree crops, and the Mekong delta, where coconuts are the main crop, account for an additional 16 per cent each of Viet Nam's total tree crop acreage. The northern mountains, which are an important centre of the country's tea production, account for a further 14 per cent of tree crop acreage.

Rubber is in many respects the most important of the industrial tree crops grown in Viet Nam, and rubber planting has a long history with about 127,000 ha having been planted to the crop by 1939. The four and a half decades of almost continuous war between the outbreak of World War II and the reunification of the country in 1975-76 resulted in a severe disruption of the rubber plantation industry, however, from which it has not yet fully recovered. Of the approximately 200,000 ha currently planted to rubber, therefore, only 67,000 ha are reported to be in production, and since much of the plant material established in the 1930s has not been renewed in the intervening period, yields are relatively low at some 700 kg of dry rubber per tapped hectare. This is comparable with the yields achieved by the largely smallholder-based industries in Indonesia and Thailand, but far below the 1.2-1.4 tonnes/ha achieved in the more regulated Malaysian industry. Some planting of high yielding Malaysian clonal material (RRIM 600) has been undertaken in recent years, however, and promises to bring about a significant improvement in average yields per hectare in due course once these new plants mature.

As illustrated in Table IV.11, the area planted to **coffee** in Viet Nam increased rapidly in the 1980s, from 23,000 ha in 1980 to an estimated 109,000 ha in 1988, and was projected to rise further to 138,000 ha by 1990. Although estimates vary, it is generally believed that some 40-60 per cent of this acreage is now in production, and output has been expanding at a rate of some 40 per cent per annum in recent years. The production of coffee is dominated by State-owned farms, which account for approximately 50 per cent of the total acreage planted to the crop in Viet Nam and 30-40 per cent of the country's total coffee output. About 20,000 ha is under the direct control of the State sponsored Union of Coffee Enterprises. Co-operatively-owned farms account for 10-20 per cent of Viet Nam's total coffee area, and the remainder is cultivated by private farmers.

Although the bulk of Viet Nam's coffee output is exported, these exports have historically been aimed mainly at the CMEA countries since the Vietnamese coffee industry is heavily weighted towards the production of the relatively high yielding but low quality robusta strains. These robusta varieties, which account for almost 95 per cent of Viet Nam's coffee acreage at present, are much less popular than the milder arabica varieties in the quality conscious OECD markets. In order to tap these markets more intensively in the future,

however, the Vietnamese authorities are reported to be considering proposals to raise the share of arabica plantings to some 20 per cent of total coffee acreage in the foreseeable future.

Table IV.11. Area, production and yields of major perennial tree crops, 1980-1995

	1980	1985	1988[a/]	1990[b/]	1995[b/]
Rubber					
Production ('000 tonnes)	42	49	47	54	119
Total area ('000 hectare)	88	180	202	237	295
New plantings ('000 hectare)	2	29	12	21	17
Cumulative 5 years ('000 hectare)				40	80
Harvest area ('000 hectare)	54	66	67	85	168
Yield (tonnes/hectare)	7.5	8.8	8.8	9.0	10.0
Coffee					
Production ('000 tonnes)	8	8	31	50	113
Total area ('000 hectare)	23	45	109	138	200
New plantings ('000 hectare)	1	8	15	16	12
Cumulative 5 years ('000 hectare)				40	75
Harvest area ('000 hectare)	11	13	35	55	130
Yield (tonnes/hectare)	0.8	0.6	0.9	0.9	0.9
Tea					
Production ('000 tonnes)	81	118	148	170	260
Total area ('000 hectare)	47	52	58	67	87
New plantings ('000 hectare)	4	4	4	6	5
Cumulative 5 years ('000 hectare)				10	30
Harvest area ('000 hectare)	35	42	46	50	65
Yield (tonnes/hectare)	2.4	2.8	3.2	3.4	4.0
Coconut					
Production ('000 tonnes)	311	600	675	863	1,560
Total area ('000 hectare)	69	127	199	200	300
New plantings ('000 hectare)	...	20	25	20	
Cumulative 5 years ('000 hectare)				60	50
Harvest area ('000 hectare)	...	80	90	115	195
Yield (tonnes/hectare)	...	7.5	7.5	7.5	8.0

Source: State Planning Committee, Socialist Republic of Viet Nam, and United Nations Development Programme, Food and Agriculture Organization of the United Nations, and the World Bank, *Viet Nam - Agricultural and Food Production Sector Review*, Draft Mission Report DD:DP/VIE/88/033, nd, page 82.

a/ Estimate.
b/ Projection.

Viet Nam is a significant producer of both black and green tea, which are well suited to the country's highland areas with heavy rainfall and short dry seasons. The planted acreage has expanded steadily at approximately 3 per cent per annum since the mid-1970s to 58,000 ha by 1988, and is projected to rise further to 87,000 hectare by 1995. This growth in acreage has been accompanied by a substantial increase in output from 81,000 tonnes (fresh weight) in 1980 to 148,000 tonnes by 1988. Despite this impressive output growth, however, the national average yield remains low at approximately 0.6 tonnes/ha. Since the more efficiently managed tea estates achieve yields of 1.5 tonnes/ha, this relatively low overall yield figure is due mainly to the poor performance of some of the older or less well maintained estates in need of rejuvenation and/or supplementary planting. The unequal performance of the tea industry is reinforced by inadequate or unbalanced applications of fertilizer, and by the effects of a 4-5 month dry season in some parts of the central highlands.

As in the case of coffee, much of Viet Nam's tea production is exported, principally to the USSR and the countries of eastern Europe. The latest available data show, for example, that 16,000 tonnes of Viet Nam's total output of 30,000 tonnes of dried tea were utilized in the domestic market, while the remaining 14,000 tonnes were exported. The Government of Viet Nam is hoping to achieve a substantial increase in exports over the coming years, with all of the expected output increase of 22,000 tonnes by 1995 being earmarked for export.

The area planted to coconut palms has grown extremely rapidly in recent years, and the average yield of 31 nuts per tree achieved by Vietnamese coconut growers is broadly comparable with that achieved by their counterparts in the Philippines. They fall well short of the potential maximum of some 150 nuts per tree, however, which could be achieved through the use of high yielding hybrid plant varieties and adequate fertilization and pest control. Recognizing that an expansion of the industry based on a simple replication of the existing low productivity plantations would not be economically justifiable, the Government of Viet Nam is concentrating on the increased adoption of high yielding plant materials and improved plantation management techniques to achieve its goal of an 80 per cent increase in output between 1988 and 1995.

Recent industrial trends and major constraints

While the industries established to process Viet Nam's various tree crops vary considerably in scale, scope and the technology they utilize, several generalizations are nevertheless possible. The most obvious of these is the fact that most of the tree crop processing industries are engaged only in the primary stages of processing, with very little manufacturing value being added beyond this basic processing. Another outstanding common feature of these industries is the relatively low level of technology employed by them, the impact of which is frequently reinforced by the insufficient availability of suitable equipment as well as the inadequate maintenance of the existing machinery. This, in turn, gives rise to the third commonality between these industries, which is the relatively poor quality of their output.

The most extensively developed processing industry for domestic tree crop products, with the most far reaching downstream linkages, is the rubber industry. This stretches from the cultivation, tapping and milling of natural rubber into sheets to the manufacture of considerable volumes of tyres and tubes, especially for bicycles, as shown in Table III.1. Despite its existing scope, however, the potential of the industry remains largely unfulfilled. As has been shown by ongoing developments in the neighbouring rubber producing countries of Malaysia, Indonesia and Thailand, natural rubber can form the basis of a wide range of manufacturing industries producing a variety of goods including not merely tyres and tubes but also footwear, belts, pipes and hoses, carpet underlay, and dipped goods such as gloves, balloons, condoms and swimming caps.

The coffee processing industry, meanwhile, is officially acknowledged to suffer from a number of serious weaknesses, the most serious of which is an imbalance in investment between planting and processing facilities. Consequently, processing facilities are inadequate to meet the current growth in coffee production, and a recent report prepared under the joint auspices of the State Planning Committee of the Republic of Viet Nam (SPC) and the Food and Agricultural Organization of the United Nations (FAO) has noted that:

> "In the concentrated production area of Don Nai, there are no processing facilities where coffee can be dried, shelled and graded. Only 6 processing facilities exist at the State-level where capacity is limited to 10,000 tonnes per year. For the remainder of the production, farmers must dry and beat the coffee by manual means to remove the shell. No grading

> occurs until the coffee beans reach the Union [of Coffee Processing Industries]. This crude process downgrades the appearance of the coffee, which results in a lower price."[15/]

The report goes on to argue that with improved processing methods, the coffee bean colour and appearance could be improved substantially, and cites estimates by the Union of Coffee Processing Industries that appropriate levels of investment in small-scale pre-processing facilities to dry and shell the coffee could increase export earnings from this crop by $100-200 per tonne. It also argues that further investment would be necessary at the district level in equipment to polish and grade the coffee beans.[16/]

The processing of Viet Nam's tea production is similarly hampered by inadequate processing facilities, with much of the equipment currently in use being of USSR origin and embodying old technologies. The available processing facilities have a capacity of 700 tonnes/day of fresh tea leaves, with pre-processing being carried out in the producing areas in relatively small-scale establishments having a daily capacity of 15-20 kg. The SPC/FAO report cited above also points out that Viet Nam does not possess the technology for the CTC (cutting-threshing-curling) method of tea processing which the market requires.[17/] A further expansion of the tea industry will therefore depend on the acquisition of the requisite processing technology, which Viet Nam is reportedly hoping to procure from India.

While no consistent quantitative assessments of the utilization patterns of Viet Nam's coconut production are available, it is generally estimated that some 20 per cent of this output is consumed as fresh product while the remainder is processed into coconut oil. According to SPC estimates cited in another recent mission report sponsored by the Vietnamese authorities as well as a number of international agencies, the total volume of coconut production in 1988 amounted to 16,000 tonnes in 1988, of which 12,000 tonnes were exported.[18/] Much of the coconut oil retained for domestic use is reported, moreover, to have been absorbed in the manufacture of soap rather than in direct human consumption. In addition, the efficiency of the oil mills is reported to be relatively low, with approximately 10,000 coconuts being required to produce one tonne of oil. This ratio could, with the appropriate improvement in oil extraction facilities, easily be reduced to some 8,000 coconuts per tonne of oil.

Prospects

The Government of Viet Nam appears certain to retain the high priority it has given to an expansion of perennial tree crop production over the past years into the foreseeable future. As shown in Table IV.11, all the major crops in this category are officially projected to experience dramatic output increases between 1990 and 1995. While the setting of these targets does not of and by itself guarantee their achievement, of course, all available indicators point towards a considerable increase in the production of these crops although export prospects to east European countries remain uncertain.

Based on planting decisions already taken, and given the usual gestation period of 5-7 years for newly planted rubber trees, the growth prospects of Viet Nam's natural rubber industry are relatively predictable. The available data therefore suggest that the projected output volume of 119,000 tonnes in 1995 is eminently achievable. In order to utilize fully the benefits of this projected increase in rubber output, however, a significant expansion of processing capacity will become necessary. Between 1990 and 1995 it may thus be necessary to build 1-2 new processing plants every year, each with a capacity of 10,000 tonnes/year, in order to meet the projected growth in output.

The prospects for coffee remain uncertain. As indicated above, Viet Nam's heavy dependence on robusta coffees severely restricts an expansion of its export potential, although the officially proposed shift towards increased production of arabica strains should reduce this difficulty over time. This change in the varietal composition of Viet Nam's coffee output will also have to be accompanied by an extensive programme to install the required processing facilities in order to overcome the existing bottle-necks described above.

In the case of tea, similarly, the projected growth in output will have to be associated with the installation of CTC processing technology to enable a realization of the full benefits of the anticipated production increases. The processing technologies currently in use in the coconut oil industry also need to be modernized in order to raise the relatively low level of extraction efficiency currently prevailing in the industry. Such an upgrading of processing capacity and quality is vital both because of the inadequacy and obsolescence of much of the existing technology, and because it represents a good investment for the future growth of export revenues from the shipment of higher quality agricultural commodities with a substantially higher level of value added than is embodied in these commodities at present.

Slaughtering and meat processing

The resource base

As an essentially rural and agricultural economy, Viet Nam has a large population of domesticated livestock and poultry. These are raised in traditional manner by farmers throughout the country for the principal purpose of satisfying the demand for draft power and organic manure for crop cultivation. Though questionable in some respects, official statistics indicate a dramatic increase in the gross value of livestock and aquaculture production during 1980-85 at an annual average rate of 7.8 per cent. The data presented in Table IV.12 indicate a similarly growth of animal numbers in the 1980s.

Table IV.12. Livestock numbers, 1980-1995

	1980	1985	1988[a/]	1990[b/]	1995[b/]
Buffaloes ('000)	2,313	2,590	2,810	3,000	3,375
Cattle ('000)	1,664	2,598	3,122	3,500	4,375
Draft animals ('000)	2,300	2,741	3,200	3,300	3,800
Pigs ('000)	10,001	11,808	11,654	14,000	16,100
Chickens (million)	48	70	72	90	120
Other poultry (million)	17	21	24	50	55

Source: State Planning Committee, Socialist Republic of Viet Nam, and United Nations Development Programme, Food and Agriculture Organization of the United Nations, and the World Bank, *Viet Nam - Agricultural and Food Production Sector Review*, Draft Mission Report DD:DP/VIE/88/033, nd, page 89.

a/ Estimate.
b/ Projection.

As a result of the gradual restoration of State and co-operative farms to private ownership in recent years, animal husbandry is now almost entirely in the hands of small-scale family farmers. According to the findings of a recent survey of Vietnamese agriculture and food production, the typical scale of livestock rearing by family units in the deltaic and lowland areas involved 1-2 buffaloes, 2-3 cows, 1-2 pigs and/or 4-5 laying hens. This survey also showed, however, that some substantially larger family farms had emerged in the southern parts of the country, and were involved in the raising of ducks, chickens, pigs, and sometimes beef cattle on an almost industrial scale. In the pastoral areas, meanwhile, families often owned or managed 10-25 animals.[19/]

The role of State farms in livestock rearing is becoming increasingly limited. The latest available data show that already by 1986 these farms kept only 0.5 per cent of Viet Nam's buffaloes, 3.0 per cent of the country's cattle, 1.5 per cent of its pigs and 0.8 per cent of its poultry. At the same time, they produced only 1.7 per cent of the country's pork, 1.6 per cent of its beef, and 0.8 per cent of its poultry meat. In general terms, State farms are now held responsible principally for the breeding of imported livestock, exotic purebreds, and new economic crosses. Over 92 per cent of Viet Nam's population of Holstein Fresian dairy cattle and 76 per cent of its population of hybrid layers and broiler parent stock are thus held by the State farms.

Though plentiful in overall terms, Viet Nam's animal resources are unevenly distributed within the country. The main division is between the lowland areas, comprising the Red River and Mekong deltas and the coastal strip linking them, where livestock rearing supplements crop cultivation, and the sparsely populated upland areas, where the best grazing areas are found. The two deltas thus account for about half of Viet Nam's pig population and pork output, and 64 per cent of the country's ducks. On the other hand, however, 59 per cent of Viet Nam's cattle are located in the central highlands and coastal zones, while 43 per cent of its buffaloes are in the northern mountain and midland areas.

Recent industrial trends

Meat production increased by 2.7 per cent per annum in 1976-1980, by 10.4 per cent per annum in 1981-1985, and was projected to rise by 9.0 per cent per annum in 1986-1990. As shown in Table IV.13, Viet Nam's total output of meat amounted to 886,000 tonnes live weight, equivalent to approximately 665,000 tonnes dressed carcass weight at a conversion ratio of 75 per cent or about 520,000 tonnes dressed boneless weight at a conversion ratio of 59 per cent, in 1988. Despite the substantial output increases recorded in the 1980s, however, average per caput consumption of animal products remains very low. The data for 1988 thus yield annual consumption estimates of about 8 kg (dressed and boneless weight) of red meat and poultry, 1.4 kg of eggs, 14 kg of fish, and trivial amounts of milk per head. Livestock products have thus been estimated to provide less than 2 grammes of daily per caput protein intake, although pork fat provides almost half the lipids (fats) in the Vietnamese diet.

Table IV.13. Animal products, 1980-1995

	1980	1985	1988[a/]	1990[b/]	1995[b/]
Meat ('000 tonnes live weight)	456	747	886	1,150	1,451
Beef ('000 tonnes live weight)	65	65	78	90	111
Pork ('000 tonnes live weight)	292	561	652	800	1,000
Poultry ('000 tonnes live weight)	99	121	156	260	340
Eggs (million)	464	1,472	1,800	3,000	4,200
Fresh milk ('000 tonnes)	3	4	6	9	16

Source: State Planning Committee, Socialist Republic of Viet Nam, and United Nations Development Programme, Food and Agriculture Organization of the United Nations, and the World Bank, *Viet Nam - Agricultural and Food Production Sector Review*, Draft Mission Report DD:DP/VIE/88/033, nd, page 89.

a/ Estimate.
b/ Projection.

The export share of animal products is minor compared to that of industrial crops. Although the precise volume of such exports is not known, it has been estimated at approximately 10,000 tonnes per annum in the late 1980s, comprising frozen pork and duck meat sold to the USSR under a barter agreement and duck eggs exported to Hong Kong and Singapore. The meat for export is merely packed in plastic bags without separating cuts of different qualities.

Meat processing in Viet Nam is limited at present to slaughtering, butchering and freezing, and . . . on a wide range of scales of operation, which span the whole continuum from small rural housel. . . . State-owned enterprises. Only the large-scale industrial enterprises, which are mainly responsible for maintaining an adequate revolving reserve of meat in the large urban areas and producing meat for export, are covered by official statistics, however. These enterprises are operated primarily by the Ministry of Home Trade. They currently comprise ten registered slaughterhouses with integrated freezing facilities, which are estimated to account for some 10 per cent of Viet Nam's total meat production. The total designed capacity of these plants amounts to 50,000 tonnes/year, but their maximum practical capacity, taking into account their present condition, is estimated at 40,000 tonnes/year. Capacity utilization is very low, however, with the total slaughter in these establishments amounting to only about 20,000 tonnes/year, of which pigs account for about 18,000 tonnes or 90 per cent.

Major constraints

A significant expansion of Viet Nam's output of animal products is currently hampered by a number of constraints. The most fundamental of these is the inadequacy of the available livestock, with the vast bulk of the country's population of farm animals consisting of indigenous breeds, which have a low genetic potential for the production of meat, milk and eggs as well as a small body size and slow growth rates. Native cattle and buffalo take particularly long to mature, while native pigs have a small body size and produce too high a proportion of fat. Indigenous poultry breeds are also small in size and have a low meat:bone ratio. In addition, native breeds are unsuitable for intensive production techniques.

The genetic unsuitability of much of Viet Nam's animal stock as a raw material for a modern commercial meat processing industry is exacerbated by the continued application of traditional low-productivity livestock management techniques. These are characterized by high feed conversion ratios (i. e. low volumes of saleable outputs relative to the volumes of inputs utilized), low dressing rates and poor product quality. In the case of ruminants, the slaughter is estimated at 7 per cent, largely because farmers prefer to expand the size of their herds even when their existing animals are poorly fed. This, in turn, results in thinner animals with low meat quality and relatively low dressing rates averaging 35 per cent for cattle and 40 per cent for buffaloes, which are less than half the rates obtained in developed countries. In the case of pigs, the present slaughter rate is estimated at 78.4 per cent, which while higher than the rate in China still reflects a period from farrow to finish 2-3 times the commercial European average. The poultry slaughter rate is approximately 130 per cent, well below the international norm of 300 per cent.

In addition to these problems related to the availability of appropriate raw materials, the Vietnamese meat production industry is also hampered by the inadequacy of the available processing facilities. With only relatively rare exceptions, such as the slaughterhouse in Tien Giang province and the Vissan slaughterhouse in Ho Chi Minh City, the existing slaughtering facilities in Viet Nam do not generally meet international standards of technical efficiency and hygiene. Even the relatively well equipped and managed slaughterhouses mentioned above would not meet EEC norms.

Prospects

As indicated in Tables IV.12 and IV.13, the Vietnamese authorities are expecting to achieve significant increases in both livestock numbers and output of animal products during the coming years. A separate set of official projections presented in Table IV.14 shows further that particularly high hopes have been pinned on a rapid expansion of meat exports as a source of foreign exchange earnings. In view of the existing constraints to output growth discussed in the previous section, however, the proposed production and export increases will require substantial investments in both the animal husbandry industry and the meat processing industry.

Table IV.14. Projected meat output and exports, 1990-2005

	1990	1995	2005
Production target (live weight, '000 tonnes)	1,043	1,308	1,843
Estimated dressed carcass meat[a/] ('000 tonnes)	782	981	1,384
Domestic consumption ('000 hectare)	744	881	1,234
Per capita consumption (kilogram)	11.2	11.2	14.3
Margin for export ('000 tonnes)	38	100	150

Source: Ministry of Agriculture and Food Industries, as cited in United Nations Industrial Development Organization, *Viet Nam's Industrial Development - An Assessment*, Report by the Regional and Country Studies Branch, Industrial Policy and Perspectives Division, UNIDO, Vienna, August 1989, page 102.

a/ Assumed as 75 per cent of live weight.

Increases in the number of available livestock and improvements in their quality remain particulary important prerequisites for the successful development of the meat processing industry. Given the low genetic suitability of the existing animal stock for this purpose, the achievement of this goal will necessitate an extensive upgrading of the available animal varieties through large crossbreeding programmes, or will have to be based on imported breeds. The gains in livestock numbers and quality obtained by these measures will have to be maintained, moreover, by the adoption of more modern animal husbandry techniques. This will involve a significant shift from the traditional patterns of livestock farming being practised at present. In particular, it will require the provision of more nutritious and balanced feed crops and dietary supplements, improved veterinary services, and more conscious efforts to optimize stocking rates in order to ensure adequate supplies to the slaughterhouses while at the same time preventing an erosion of the average quality indicators of the remaining herds and flocks.

Any measures to increase the availability of more suitable livestock must be accompanied by a substantial increase in the number of large-scale slaughterhouses and a long-term commitment to increase the levels of industrial slaughter. The physical increase in the number of slaughterhouses will have to be accompanied, moreover, by matching steps to raise the technical and hygienic standards of the Vietnamese meat processing industry in order to ensure a continued growth of export markets at a time when the dramatic changes of the past year in eastern Europe and the impending radical changes in the USSR may restrain demand in these traditional markets for Vietnamese meat products.

Fish processing

The resource base

With its maritime location at the edge of the south-east Asian mainland, its extensive networks of inland waterways, and its reliance on wet rice cultivation requiring the submersion of vast areas of cropland for lengthy periods of each year, Viet Nam has an immense potential for salt-, brackish-, and fresh-water fisheries and aquaculture. For analytical purposes, these fisheries resources can be distinguished according to the geographical area in which they appear, with the separation into the following four groupings being particularly useful:

- Inland fisheries and fish farming.
- Coastal fisheries and aquaculture.
- Marine fisheries from the coastline to a depth of 100 metres.
- Marine fisheries from a depth of 100 metres outward.

Fisheries in the inland and coastal areas can be further subdivided according to the waters in which they occur. Five categories in particular can be distinguished - ponds; flood plains and submerged areas; lakes, reservoirs and rivers; mangroves and lagoons; and swamps - of which the flood plains and submerged areas have the largest surface area according to the latest available data presented in Table IV.15. Pond culture, involving the rearing of fish in specially constructed ponds, is estimated to yield approximately 1.9 tonnes/ha/year, while paddy field culture in flood plains and submerged areas is estimated to yield 100-150 kilogram/ha/year. Aquaculture in lakes, reservoirs and rivers can take several forms, involving both capture fisheries from stocked or unstocked bodies of water and breeding in cages and pens. Capture yields from stocked areas are estimated at approximately 150 kg/ha/year, while capture yields from unstocked areas are estimated at some 80 kg/ha/year and yields from cage and pen culture are cited at some 6,500 tonnes/year from some 2,400 cages and pens. Brackish water fisheries, lastly, which consist mainly of shrimp culture in lagoons and mangrove swamps, are estimated to yield approximately 300 kg/ha/year. A particularly striking feature of these yield estimates are the differences in productivity achieved by the various forms of inland and coastal fisheries, with the 72 per cent of total water surface area used only for capture fisheries accounting for 36 per cent of total output while the 4 per cent of surface area used for pond culture account for 39 per cent of production.

Although Viet Nam's deep-water fish resources have been variously estimated at 2-3 million tonnes and 6-7 million tonnes, infrastructural constraints limit the activity of Viet Nam's maritime fishing industry to close inshore areas up to a depth of 100 metres. These are estimated to have total fish resources of some 3-4 million tonnes and a harvesting potential of 1.3-1.4 million tonnes/year, and are fished by a large fleet of relatively small and obsolescent boats with an estimated average age of 15 years. The national fishing fleet is thus estimated to comprise about 50,000 motorized boats, over 70 per cent of which have engines with an output of less than 22 horsepower, and some 10,000 non-motorized vessels. The main fishing methods

employed by the Vietnamese marine fishing industry include trawling, purse seiners, gill nets and deep nets. About two thirds of the fish landed by the industry consist of pelagic species, with a disproportionate share of the total catch consisting of relatively small fish.

Table IV.15. Surface area of waters suitable for inland fisheries, 1983

	Area (hectare)
Ponds	57,000
Flood plains and submerged areas	547,000
Major lakes, reservoirs and rivers	394,500
Mangroves and lagoons	290,700
Swamps	84,700
Total	**1,373,900**

Source: State Planning Committee, Socialist Republic of Viet Nam, and United Nations Development Programme, Food and Agriculture Organization of the United Nations, and the World Bank, *Viet Nam - Agricultural and Food Production Sector Review*, Draft Mission Report DD:DP/VIE/88/033. nd, page 96.

Recent industrial trends

The Vietnamese fish products processing industry is dominated by the State controlled National Union of Viet Nam Fishery Producers and Import-Export Corporation, Seaprodex, which owns 12 of the country's 65 fish processing plants. Beyond its direct involvement in fish processing activities, Seaprodex is also responsible for providing technical assistance to the entire fish processing industry and for co-ordinating the industry's production and investment plans. In addition, Seaprodex controls Viet Nam's exports of fish products and is also involved in importing activities since the bulk of Viet Nam's export trade in fish products is conducted on a barter basis.

Viet Nam's fish processing plants are all located along the country's coastline in 22 different provinces, but with a concentration of 20 plants in the Ho Chi Minh City area. Of the 53 plants not owned by Seaprodex, two belong to the Ho Chi Minh City municipality and the remainder to other provincial authorities. Most of the fish processing plants are relatively modern and well equipped, with 12 having been established since 1986 alone. All of these plants have cold storage facilities of varying capacities, which embody Japanese or Scandinavian technology and can accommodate a total volume of 8,000 tonnes of fish products. All of these plants also operate relatively hygienically, and with an adequate level of quality control.

In addition to the 65 plants processing fish products for human consumption, Viet Nam also has two fish meal plants. These are located in the northern port city of Hai Phong and in the town of Rach Gia in the extreme southwest of the country respectively. The protein content of their output is reported to be relatively low, however, since their raw material consists primarily of shell and cartilage.

All of Viet Nam's 65 industrial fish processing plants produce at least part of their output for export, with 60 plants producing frozen products and the remaining five specializing in dried products. The freezing capacity of the Vietnamese fish processing plants ranges from 1-2 tonnes/day to 30 tonnes/day, with the total national freezing capacity for fish amounting to 350 tonnes/day. Based on the relatively high capacity utilization rates prevailing in the frozen fish products industry and assuming 300 working days per annum, the industry's total output is estimated at approximately 100,000 tonnes of final products per year.

The processing of the sea food prior to freezing is carried out entirely by manual means, and is frequently limited in scope. Although all plants have premises and facilities for filleting fish, for instance, considerable quantities are frozen after cleaning only. The industry employs only contact freezers, which in most cases

require only 4-5 hours to complete the freezing process, although in some plants as many as 8 hours may be needed.

A large proportion of the frozen fish processing industry is based on the processing of shrimp, much of which is destined for export to Japan. To enable it to meet the stringent quality requirements of the Japanese market, the industry has obtained considerable material and technical support from Japanese companies. Almost equal quantities of fresh water prawns and various kinds of sea water prawns are processed in these plants.

The production of dried fish is usually preceded by the cleaning and pre-drying of the catch by the fishermen concerned prior to the delivery of the fish to the processing installations. This is followed by sorting, dry brushing, washing, roasting, rolling (using cut-rollers), ultra-violet radiation and packing at the processing plant itself. The total annual output of dried sea products amounts to approximately 14,000 tonnes.

The production of dried cuttlefish for export to Japan is a particularly important activity within the fish drying industry. This generally involves the use of modern drying chambers, since sun-dried products do not meet the quality standards of the Japanese market. Apart from cuttlefish, several other varieties of seafood, including fish and shrimp, are dried for both export and local consumption in Viet Nam.

In recent years the Vietnamese fish processing industry has been assessing the viability of other processing methods in addition to the currently employed techniques of freezing and drying. In this context, a canning facility has been established on a pilot scale with the assistance of UNIDO. Its output is intended to be marketed primarily on the domestic market.

In addition to the industrial processing facilities discussed above, the Vietnamese fish processing industry also comprises an extensive - albeit statistically poorly documented - network of cottage sized enterprises owned mainly by private businessmen or by co-operatives. As noted above, these are engaged in the preliminary cleaning and sun drying of fish and shrimp for delivery to the industrial fish drying plants. An even more important activity carried out by these enterprises is the production of fish sauce. This involves mixing the otherwise unusable parts of the fish catch with salt in a ratio of 2:1, and allowing the resulting mixture to cure in the sun and ferment for several months before draining off and filtering the liquid so produced. The total output of fish sauce produced in this manner by small-scale privately and co-operatively-owned enterprises is estimated to amount to approximately 100,000 tonnes/year.

Major constraints and future prospects

At present the principal constraint inhibiting the growth of the fish processing industry is limited potential for a rapid expansion of the available fish catch. In the case of inland and coastal fisheries, some scope still exists for the development of pond culture, cage and pen rearing, and brackish water culture, but the realization of this potential will require considerable volumes of investment. The scope for a significant expansion of capture fisheries in inland and coastal waters, on the other hand, is very limited. Fish stocks in many of these waters have already been adversely affected by the increasing use of fertilizers and pesticides in agriculture and by the expansion of irrigation and hydropower facilities, and appear unlikely to be revived in the foreseeable future. The stocking of open watercourses is also likely to be counterproductive, since the increased population of fingerlings is likely to attract an increased number of predators. In addition, paddy field fish culture is increasingly being restrained by the growing adoption of multiple cropping, which reduces the duration of field flooding to below the level required for fish cultivation.

An expansion of Viet Nam's maritime fisheries is also restricted by the inadequacy of the country's fishing fleet to exploit deeper waters beyond the relatively narrow inshore areas in which it currently operates and where the minimum sustainable catch is already believed to have been exceeded. Any extension of fishing activities beyond this area will require a substantial modernization of the country's fishing vessels and equipment. This again will necessitate high levels of investment, the funding of which may be difficult in the current climate of political and economic uncertainty.

These raw material constraints notwithstanding, the Vietnamese authorities are anticipating a substantial expansion of the fish processing industry during the coming years. As indicated in Table IV.16, a particularly strong output growth is projected for frozen fish products. The realization of these growth targets is likely to require a considerable degree of foreign co-operation, however, as exemplified by the recent signing of

several joint venture agreements. One of these, with the Soviet firm Seaprimfico, includes elements of barter trade, and is focused on the following four areas:

- Exploitation of marine fisheries resources.
- Provision of sea transport facilities for export products.
- Development of marine fish culture.
- Provision of fishery services, including fishing equipment, fuel, machinery, consumer goods and fertilizer.

Table IV.16. Fish processing, 1980-1995

	1980	1985	1988[a/]	1990[b/]	1995[b/]
Fish sauce (million litres)	83.3	143.3	176.0	150.0	200.0
Fish meal ('000 tonnes)	6.7	5.0	7.0	10.0	15.0
Dried sea products ('000 tonnes)	3.6	15.7	16.0	18.0	23.0
Frozen sea products ('000 tonnes)	3.8	20	27.0	42.0	55.0

Source: State Planning Committee, Socialist Republic of Viet Nam, and United Nations Development Programme, Food and Agriculture Organization of the United Nations, and the World Bank, *Viet Nam - Agricultural and Food Production Sector Review*, Draft Mission Report DD:DP/VIE/88/033, nd, page 107.

a/ Estimate.
b/ Projection.

Another such agreement has been signed with the private Australian firm Lobana, which has long standing ties with Seaprodex, and covers the exploitation, cultivation and processing of marine products as well as the development of other economic sectors.

These agreements and ongoing discussions with other prospective partners underline the fact that the Vietnamese authorities regard joint ventures with foreign firms as an important source of the financial and technical resources needed to develop the country's fishing and fish processing industries. In particular, it is hoped that these arrangements will help to improve the quality of Viet Nam's export products to the standards required by the international markets. The introduction of refrigerated fishing vessels capable of exploiting the fish resources of more distant waters is regarded as a further potential benefit of such international joint ventures.

Forest-based processing industries

The resource base

Although official Vietnamese statistics classify 15.6 million ha as forest land, only half of this acreage, 7.8 million ha, actually carries trees. According to data provided by the Ministry of Forestry, the total volume of trees on this forested area amounts to 565.6 million cu m, implying an average density of 72.5 cu m/ha. The average annual growth rate of natural forests, meanwhile, is estimated at 2 cu m/ha/year, while the growth rate of eucalyptus and pine forests is cited as 3 cu m/ha/year and that of intensively cultivated agro-forestry plantations is quoted as 15 cu m/ha/year.

Viet Nam's natural forestry resources are reportedly being lost, or badly degraded, at a rate of 150,000-200,000 ha/year. In addition, the available data suggest that the volume of standing timber is decreasing at a rate of 7 per cent per year due to over-cutting. The volume of annual felling is estimated at 1.5 million cu m, distributed among major product groups as shown in Table IV.17. Official projections indicate that the felling will be increased substantially in the coming years, moreover, to 2.5 million cu m by 1995 and 4.2 million cu m from the year 2000 onwards.

Table IV.17. Timber felling and utilization

	Volume (cubic metre)
Sawn products	1,000,000
Pulp	200,000
Pit props	100,000
Poles, etc.	100,000
Miscellaneous	100,000
Total	**1,500,000**

Source: United Nations Industrial Development Organization, *Viet Nam's Industrial Development - An Assessment*, Report by the Regional and Country Studies Branch, Industrial Policy and Perspectives Division, UNIDO, Vienna, August 1989, page 108.

An extensive afforestation programme pursued by the Government of Viet Nam has hitherto resulted in 160,000 ha/year being planted with eucalyptus or bamboo. By the year 2000, the scale of this programme is projected to be increased to 200,000 ha/year, including 20,000 ha/year for fuel wood and 40,000 ha/year for agro-forestry based on fast growing eucalyptus species, which will be ready for harvesting after ten years followed by three crops at eight year intervals grown from coppices. In addition, 500 million trees are projected to be planted annually at village level, which at an average density of 2,400 trees per ha implies an area of more than 200,000 ha per year.

Recent industrial trends

Viet Nam possesses a relatively large sawmilling industry, comprising approximately 600 mills with a total capacity of 2,000-3,000 cu m/year for each unit if operated for two shifts per day. The present output levels suggest, however, the mills are only operated at one shift per day or less. This appears to be due mainly to the fact that the sawmilling industry suffers from an unreliable supply of timber caused by insufficient logging and transport capacity from the felling area, as well as the lack of adequate and timely planning.

Beyond its input supply problems, Viet Nam's sawmilling industry itself is reported to be suffering from a number of serious weaknesses. Studies of the industry conducted by the FAO thus concluded that "all saw mills seen are in a very poor condition" and that "the majority of the mills are beyond economical use."[20/] Most of these mills do not have mechanical log feeding facilities and only rudimentary controls. As a result, the dimensional uniformity of the sawn wood produced at these facilities is sub-standard, while the wastage generated by them is well above levels normally regarded as acceptable.

The pulp and paper industry is another important processor of Viet Nam's forestry resources. It is largely under the control of the Ministry of Light Industry, and has a total capacity of about 200,000 tonnes/year. The industry's two most modern elements are a large paper mill with a designed capacity of 55,000 tonnes/year built at Bai Bang in the late 1970s and early 1980s in co-operation with the Swedish International Development Authority (SIDA), and a new mill of French design with a capacity of 48,000 tonnes/year built at Ten Mi in the late 1980s. In addition, the industry includes some ten old mills operated by the central government with a total capacity of about 40,000 tonnes/year and some provincial enterprises with a combined capacity of 30,000 tonnes/year.

In common with the other forest-based industries, the pulp and paper industry also suffers from considerable raw material shortages, which affects not only the forest products themselves but also such ancillary materials as caustic soda and other chemicals. Largely as a result of these input supply problems, the industry's capacity utilization rate is estimated at only about 50 per cent. The resulting output levels imply a per caput availability of only 3 kg of paper per year.

Viet Nam possesses three plywood plants, each of which have a capacity of 6,000 cu m timber input per year. One of these plants was built in 1958 using equipment from Czechoslovakia, while the other two are of United States manufacture and were presumably established in the early 1970s. The capacity utilization rate at these plants is currently estimated at 30 per cent, mainly because of the same shortage of timber which afflicts all other forest-based industries.

Three veneer plants with French machinery were installed in 1979. Each of these has a designed capacity of 3 million sq m/year using timber with a minimum diameter of 60 cm. With only 30 cm diameter logs being available at present, however, the capacity utilization of these plants is estimated at only 40 per cent and the quality of their output is low. The impact of the general shortage of timber on these plants is aggravated, moreover, by a similar shortage of spare parts.

A chipboard plant was supplied by Czechoslovakia in 1978. The installed capacity of 10,000 cu m timber input per year was utilized at a rate of 60 per cent until 1980. Thereafter production had to be suspended owing to a lack of timber and the plant was subsequently remodelled for the manufacture of bamboo mats.

Secondary wood industries in general and furniture industries in particular are frequently equipped with old machinery. Despite its obsolescent design, however, this equipment appears to be operating reasonably successfully. While the existing production lines are certainly in need of rehabilitation, therefore, this can to a large extent be accomplished on the basis of the existing equipment.

To overcome the prevailing inefficiencies on the production lines of these industries, it will also be necessary to introduce modern concepts of material handling and process flow. In addition, considerable effort will need to be directed towards improved design and assembling systems to attract a wider international market. Co-operation with overseas furniture manufacturing companies in this field of activity could yield particularly beneficial results for both parties.

Major constraints and prospects

A major constraint to the future expansion of the forest products industries in the coming years is likely to be a shortage of raw materials, with many outside observers regarding the official projections of the increase in tree felling during the 1990s as overly optimistic. According to the report of the UNDP/FAO Forestry Programming Mission (VIE/085/003), forestry in Viet Nam is in a crisis situation, with rapidly diminishing natural resources that fall short of the level required for sustained productivity and environmental protection. In addition, the report also points out that plantations have not been very successful so far, with their average survival rate being estimated at 40 per cent.[21/]

While any expansion of the wood processing industry will therefore depend crucially on measures to remove or reduce the existing input supply bottle-necks, much also needs to be done to raise the efficiency of the utilization of Viet Nam's scarce forestry resources. In particular, the sawmilling industry will have to undergo an extensive programme of rehabilitation and modernization, involving inter alia the replacement of some old and wasteful equipment. Apart from renewing its hardware, however, the wood processing industry in Viet Nam will also need to adopt more efficient planning and management practices on a wide scale before it will have any prospect of achieving a significant expansion under the prevailing circumstances.

B. TEXTILES AND CLOTHING

The manufacture of textiles and clothing - after food processing - is Viet Nam's single most important industrial activity, and in 1987 accounted for almost 15 per cent of the total value of industrial production in the country. According to official data, which may not be comprehensive in their coverage, it consists of approximately 4,625 firms and employs about 625,000 people. Like most other industries in Viet Nam, it is structured to include State-owned, co-operatively-owned, and privately-owned enterprises, with the State-owned firms being operated either by the central government or by local governments.

In terms of location, the textile and clothing industry is divided almost equally between the north and south of the country, with the largest concentrations being found in Hanoi and Ho Chi Minh City. Together with the city of Nam Dinh some 80 km south of Hanoi, which is the third largest centre of textile manufacture, these major concentrations account for about 70 per cent of Viet Nam's total manufacturing capacity for textiles and clothing. The city of Da Nang in central Viet Nam accounts for a further 10 per cent of this capacity, with the remaining 20 per cent being shared by several other cities, including Hue (also in central Viet Nam) and Haiphong (to the east of Hanoi).

Within the domestic market, the output of the textile and clothing industry has traditionally been distributed via a network of wholesalers, with the factories only selling to these intermediaries. More recently, however, small volumes of direct factory sales to retailers have begun to be permitted, although the retailers are required to buy in considerable bulk and to pay a premium of about 5 per cent over the prices demanded from wholesalers, who often transact their business in United States dollars. The retail industry, which until recently was monopolized by State-owned shops, is also undergoing a considerable expansion and restructuring, with large numbers of privately and co-operatively-owned firms coming into existence. A UNIDO mission despatched to Viet Nam in 1989 to assess the state of the textile and clothing industry thus reported that "as a rule, virtually every owner of a sewing machine becomes a retailer".[22/]

The textile and clothing industry also plays a major role in Viet Nam's international trade, and has long been the country's largest earner of foreign exchange. This has taken the form primarily of transferable rubles since some 90-95 per cent of Viet Nam's textile and clothing exports have traditionally been shipped to CMEA countries. Following the standard Vietnamese convention of valuing the transferable ruble at parity with the United States dollar, the total value of Viet Nam's textile and clothing exports is estimated to have reached almost 200 million rubles/dollars in 1989 as shown in Table IV.18.

Table IV.18. Exports and imports of textiles and clothing, 1980-1989

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989[a/]
Exports:										
Total value of textiles and clothing (million rubles/dollars)	52	47	62	76	85	93	93	91	132	193
Value of clothing exports only (million rubles/dollars)	44	39	52	66	74	81	74	60	99	145
Cotton and peco yarn exports (tonnes)	5,300	2,961	4,887	5,028	6,800	6,300	4,900	6,200	7,300	8,300
Imports:										
Imports of raw cotton ('000 tonnes)	41	...	...	50	38	50	54	64	...	...
Imports of cotton yarn (million metres)	...	...	...	4	2	3	7	9	...	...
Imports of fabrics (mainly cotton) ('000 tonnes) ('000 tons)	56	...	...	11	29	20	27	34	...	...

Source: General Department of Statistics, Hanoi, as cited in United Nations Industrial Development Organization, *The Textile and Clothing Industry in Viet Nam: A Filiere Approach*, UNIDO, Vienna, 9 May 1990, page 3.

a/ Projected.

Ready-made garments, comprising mainly shirts, ladies' wear, suits, jackets, coats and a growing volume of sportswear and children's clothing, account for approximately three quarters of the total export revenues generated by the industry, with about 30 per cent of total domestic clothing production currently being earmarked for export. Among the market economies, Canada and the Federal Republic of Germany were

the most important customers in 1989, followed by Singapore, Hong Kong, Taiwan Province of China, the Philippines, Thailand, France, Sweden, Nigeria, Saudi Arabia, Australia and the Republic of Korea. Each of these countries absorbed only a relatively small share of Viet Nam's textile and clothing exports, however, and a significant expansion to the OECD countries is unlikely in the foreseeable future in view of the stringent quota regimes imposed by these countries.

Viet Nam's textile exports have in the past also been shipped almost exclusively to the CMEA countries, with Japan, Canada, Hong Kong, the Republic of Korea and Taiwan Province of China being the only market economies to import modest volumes. In 1989 these exports are estimated to have covered 10,000 tonnes of yarn, 20 million metres of material, 3 million metres of knitwear, and 400 tonnes of towels shipped to Japan as part of a barter deal for machinery. Negotiations are currently in progress for an increased Japanese off-take, and Malaysia has also shown an interest in importing Vietnamese textiles.

The textile and clothing industry also constitutes a large share of Viet Nam's annual import requirements, with large supplies of raw cotton, cotton yarn and artificial fibres having to be imported, principally from the USSR. The latest available statistics indicate that the total value of these imports amounted to approximately 82 million rubles in 1985. In addition, a substantial proportion of the industry's requirements of chemicals, equipment and spare parts must also be met from imports, with the total value of these imports being estimated at 14.3 million rubles/dollars in 1989.

The conduct of foreign trade in textiles and clothing, and in the inputs required to produce them, has historically been dominated by large State-owned trading groups. The most important of these, Textimex and Confectimex, are affiliated to the Unions of Textile Enterprises and Garment Factories respectively, both of which account for some 90 per cent of Viet Nam's exports in their respective fields. In line with the liberalizing reforms introduced in recent years, however, individual firms have now been given permission to export directly provided their exports amount to at least $2 million and they can demonstrate a "familiarity with the corresponding export market". Increasingly, firms are beginning to band together in order to meet the $2 million limit.

Textiles

The resource base

Domestic production and international trade data concerning the various raw materials used by the Vietnamese textiles industry are summarized in Table IV.19. These data show that the range and volume of domestically produced raw materials is relatively limited, with only modest quantities of cotton, silk, jute and hemp being produced within the country and a local production capacity for synthetic fibres being wholly lacking. Consequently, almost all of the raw material requirements of the textile industry need to be imported.

The inadequacy of Viet Nam's domestic supply of cotton, which currently meets only about 7-8 per cent of the textile industry's needs, is a particularly serious constraint to the expansion of the industry. Since Viet Nam enjoys some of the most favourable conditions for cotton cultivation in all of south-east Asia, a significant increase in cotton production appears feasible in principle. In view of a severe shortage of cultivable land, however, with the total per caput availability of such land for the production of both food crops and industrial raw materials currently estimated at only 1,000 sq m, improved yields rather than increased acreage will have to be the main source of the desired increase in output.

Significant improvements in the quality of the cotton seeds cultivated in Viet Nam have already been achieved, with the length of the cotton fibre having been extended from a minimum of 27 mm to 30-33 mm. This compares with a fibre length of Egyptian cotton of 35-38 mm. In addition, a considerable measure of success has also been achieved in increasing the resistance of Vietnamese cotton to infestation by insects and variations in climate.

The total area of cotton currently under cultivation is estimated at approximately 15,000 ha, most of which consists of very small lots spread throughout the country. The largest contiguous area is a block of 3,000 ha in the south of the country. Three State-owned plantations account for about 1,000 ha of the total cotton growing area, with the rest being divided in a ratio of 70:30 between co-operatives and small private farmers. Largely as a result of higher levels of fertilizer and pesticide usage the State-owned enterprises attain yields of some 480 kg/ha, well in excess of the average yield of 310 kg/ha achieved by co-operatives and small

Table IV.19. Production, imports and exports of textile raw materials, 1980-1989

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989[a/]
Production:										
Cotton (seeds)										
Output ('000 tonnes)	2	2	4	4	5	5	5	4	...	...
Cultivated area ('000 hectare)	7	7	11	13	14	14	13	13	...	...
Hemp (ramie)										
Output (tonnes)	100	100	100	100	100	100	...	...	...	...
Cultivated area (hectare)	200	200	100	300	200	100	...	...	...	...
Jute										
Output ('000 tonnes)	28	33	38	49	44	47	55	58	...	...
Cultivated area ('000 hectare)	18	17	17	25	20	22	26	32	...	...
Mulberry leaves										
Output ('000 tonnes)	75	66	80	76	72	56	57	54	...	...
Cultivated area ('000 hectare)	9	9	10	11	9	7	7	7	...	...
Raw silk										
Output (tonnes)	136	111	...	...	116	124	126	122	...	...
Imports:										
Course grained cotton										
Volume ('000 tonnes)	42	39	53	44	42	49	54	65	64	55
Value (million rubles/ dollars)	32	44	65	56	56	68	...	...	...	...
Cotton yarn										
Volume (tonnes)	1,790	1,160	880	890	3,440	2,480	4,520[b/]	3,160[b/]	...	...
Value ('000 rubles/ dollars)	7,123	3,256	3,518	2,191	10,809	7,134	...	...	...	...
Viscose, polyester										
Volume (tonnes)		4,140	2,630	4,200	6,500	4,410	...	...	...	...
Value ('000 rubles/ dollars)		4,561	4,131	4,928	8,666	6,048	...	...	...	...
Exports:										
Cotton fibre										
Volume (tonnes)	3,400	1,790	1,870	2,310	2,440	2,300	4,300	6,800	...	...
Value ('000 rubles/ dollars)	5,424	3,670	4,126	5,000	5,455	5,285	...	...	...	...
Cotton/polyester fibre (mixed)										
Volume (tonnes)	1,890	1,170	3,080	2,210	3,480	4,030	800	...	...	...
Value ('000 rubles/ dollars)	4,109	2,630	8,276	6,112	9,865	11,754	...	...	...	...
Jute fibre										
Volume ('000 tonnes)	4	1	4	6	15	10	12	11	...	...
Value ('000 rubles/ dollars)	1,060	270	1,120	1,460	5,410	4,520	...	...	...	...
Silk (silkworm)										
Volume (tonnes)	7		34	71	22	...	31	42	...	...
Value ('000 rubles/ dollars)	154		302	425	287		...	...	...	...

Source: State Planning Commission and IFO Institute, as cited in United Nations Industrial Development Organization, *The Textile and Clothing Industry in Viet Nam: A Filiere Approach*, UNIDO, Vienna, 9 May 1990, pages 8-9.

a/ Plan.
b/ Includes synthetic fibre.

farmers. Recent studies indicate, however, that substantial yield increases are possible, especially in the south of the country where yields of 2,500 kg/ha have been obtained on experimental plots.

Silk represents another major raw material for textile production. It has a great tradition in Viet Nam, even though its cultivation has hitherto been largely limited to the north of the country. The principal centres of silk cultivation are the provinces of Thuan Hai and Lam Dong, although coastal areas throughout the country up to an altitude of 1,000 metres offer good conditions both for the cultivation of mulberry leaves and the rearing of silkworms. Owing to the maintenance of relatively low procurement prices by the State procurement agencies, however, the area planted to mulberry trees has declined considerably in recent years, from 10,800 ha in 1983 to some 6,000 ha in 1988.

Since that time the government has begun to give increased priority to the development of the silk industry, and the achievement of a rapid expansion of output. From some 125 tonnes in 1987, production of raw silk was thus projected to rise to some 500 tonnes in 1990 and 2,000 tonnes by 1995. These forecasts may prove to be overly ambitious, however, since the envisaged new planting and replanting will not yield quick results. After planting, the young trees only yield 5 tonnes/ha in the first year and 8-10 tonnes/ha in the second year. The full yield of 18-20 tonnes/ha is only achieved in the third year.

The projected growth of the silk industry will involve a particularly strong expansion in the south of the country, where the conditions for silk growing differ markedly from those in the north in two important respects. First, the yield of mulberry trees is much higher in the north than in the south, with northern trees producing 20-25 tonnes of leaves per ha while trees in the south produce only 18 tonnes/ha. Second, and mitigating the effects of the lower leaf yields to some extent, breeding conditions are better in the south, where continuously stable weather conditions permit the production of "white silk" with a long thread of up to 1,100 metres. In the north, the white type can only be produced for nine months, and the thread length is reduced to 800 metres. During the three hot months, only the yellow type of silk with a thread length of 350-400 metres can be produced.
The silk industry also suffers from a shortage of adequate equipment. Due to a lack of fine spooling machines, of which two would be required at a cost of $600,000 each, Vietnamese silk has only been able to achieve the quality level 2a, which sells at a considerable discount relative to the higher qualities 4a and 6a. Otherwise the quality of the white silk produced in Viet Nam is comparable to that produced in China, Thailand and Japan.

Negotiations are in progress between Japanese interests and the Union of Textile Enterprises about the possibility of establishing a joint venture for the production of white silk from tapioca. The project is expected to involve a capital investment of $10-15 million, and to cover a total area of 600,000 ha in the central and southern provinces of Binh Dinh, Thuan Hai, and Phu Khanh. When fully operational, this project is estimated to yield an average annual output of 7,000-8,000 tonnes.

Viet Nam produces no synthetic fibres, but several types of trees native to the country are believed to be suitable for the production of cellulose viscose and proposals for the establishment of the necessary manufacturing plants have already been drawn up. In the face of funding constraints, however, it appears unlikely that any of these proposals will be realized in the foreseeable future. Meanwhile, the discovery of commercially viable reserves of crude oil and natural gas in Viet Nam have prompted discussions about the feasibility of establishing a downstream petrochemical industry in the country, which would also include a manufacturing capacity for chemical fibres. An alternative proposal currently under consideration calls for the domestic production of polyester from imported raw materials. Neither of these programmes is likely to be implemented until several years after the turn of the century, however, and in the intervening period Viet Nam will almost inevitably remain dependent on imported supplies.

Recent industrial trends

The production of textiles is the second most important activity in Viet Nam after the production of food, and accounted for 13.1 per cent of the country's gross domestic product in 1987. As shown in Table IV.20, the industry has achieved significant, if erratic, growth during the past decade, with the total volume of fibre and finished silk cloth produced in Viet Nam being doubled between 1980 and 1987. Additional data gleaned by a recent UNIDO mission suggest that the country's total output of yarn and textile material fell from about 38,000 tonnes and 320 million metres respectively in 1978/79 to 22,000 tonnes and 200 million metres in 1980 before gradually rising again to 62,000 tonnes and 420 million metres by 1988.[23/]

Table IV.20. Production of some selected products in the textile industry, 1980-1987

	Fibre (total) ('000 tonnes)	Silk (silkworm) (tonnes)	Finished silk cloth (million)
1980	29.3	136	179.2
1981	31.0	111	167
1982	35.8	-	233.6
1983	44.8	-	306.5
1984	52.7	116	364.5
1985	51.3	124	374
1986	52.4	126	357.3
1987	56.7	122	361.4
Annual growth 1980-1987 (percentage)	9.9	-1.5	10.5

Source: State Planning Commission; Calculations of the IFO Institute.

A statistical summary of developments in the Vietnamese textile industry between 1980 and 1987 is presented in Table IV.21. This shows that State-owned enterprises operated both by the central and provincial governments have historically played a very important role in the industry. By 1987 their total number had risen to 118, and their combined work force to some 110,000 people. Excluding handicraft production, moreover, they accounted for two thirds of the total value of Viet Nam's output of textile materials. The remainder of the industry consisted of approximately 2,800 co-operatives and private firms, which employed approximately 383,500 people.

The textile industry is organized around the Viet Nam Union of Textile Enterprises, which includes 34 major firms with a total labour force of 60,000 as well as a large number of smaller enterprises. Together, these firms operate some 860,000 spindles and 20,000 looms, an undefined number of which are hand-looms. Six of the Union factories are purely spinning mills, and 35 are combined spinning and weaving mills. In addition, the Union operates the foreign trade firm Textimex, a textile research centre, and two technical centres for repairs and spare parts, which produce 700 tonnes of parts per year.

Major constraints

Apart from the raw material constraints discussed above, the principal hindrance to an efficient operation of the textile industry is the obsolescence of much of the equipment it employs. This is underlined by the data in Annex Table A-17, which provide a survey of the age distribution of the machinery in use in Viet Nam's major textile manufacturing plants. With the partial exception of the equipment used in the primarily State-owned spinning mills and the still largely underdeveloped knitwear factories, almost all of this machinery is shown to be older than ten years. This has obvious implications for the efficiency and productivity of the industry.

The spinning mills have a potential capacity of 80,000 tonnes/year, but this is seldom achieved, with the fact that some 60 per cent of the 868,000 spindles used by the industry are more than 20 years old playing a significant part in determining the sub-optimal rates of capacity utilization. The situation is even worse in the weaving industry, where some 80 per cent of the machinery is more than 20 years old, and where, as indicated in Annex Table A-18, the industry wide capacity utilization rate is a mere 66 per cent. The printing and dyeing industry fares little better, with 90 per cent of the equipment exceeding an age of 20 years and the capacity utilization rate shown by the statistics in Annex Table A-19 to be only 67 per cent. The knitwear industry, finally, is shown in Annex Table A-20 to have a capacity utilization rate of only 50 per cent even though about half of its equipment is less than ten years old. With some 50 per cent of knitwear output

being produced by co-operatives, this very unfavourable level of capacity utilization may be explained to a considerable extent by inadequate availabilities of the necessary raw materials.

Table IV.21. Official data of the textile industry, 1980-1987

	Unit	1980	1985	1986	1987	Growth 1980-1987 Percentage per annum
Value of production (fixed prices 1982)						
State sector	Million dong	3,632	6,314	6,517	6,893	9.6
Local sector (including handicraft)	Million dong	4,559	8,192	8,529	9,692	11.4
Only handicraft	Million dong	2,899	5,220	5,843	6,253	11.6
Total	Million dong	8,191	14,506	15,046	16,585	10.6
Share of the total industrial production value						
Total	Per cent	12.2	13.8	13.5	13.1	
Only handicraft	Per cent	10.9	11.4	12.0	11.6	
Number of State enterprises						
Central State sector	Number	42	29	30	29	
Local sector	Number	123	84	86	89	
Total	Number	166	113	116	118	
Number of co-operation and smaller enterprises/handicraft	Number				2,822	
Employment in the textile industry						
Industrial work-force						
Central State sector	Number	48,600	61,000	63,600	63,600	3.9
Local sector	Number	31,400	41,300	41,100	46,800	5.9
Total State	Number	80,000	103,200	104,600	110,100	4.7
Management work-force	Number	10,000	14,300	13,500	12,000	3.1
whereof:						
Skilled work-force of handicraft	Number		374,600	341,400	383,500	

Source: *Statistical Yearbook of Viet Nam 1987*; Calculations of the IFO Institute.

Prospects

Despite the relatively high importance of the textile industry in the Vietnamese economy, its overall output remains low. An admittedly very low and perhaps not quite accurate estimate obtained by a recent UNIDO mission thus shows that domestic sales of cloth currently amount to only 0.6 kg of material per caput per year. Over the coming 10-15 years, however, the government hopes to achieve a dramatic expansion of the industry, with annual per caput availabilities being increased to 1.0 kg by the year 2005. Since Viet Nam's current population of about 66.6 million is expected to have risen to well above 80 million by the year 2000 and more than 92 million by 2005, and since greater efforts are to be made to exploit the export potential of Vietnamese textiles during the coming years, the official targets imply a substantial output increase over this period.

Preliminary plans have already been formulated for the expansion and modernization of the textile industry, with particular emphasis being placed on the upgrading of the spinning mills, dyeing plants and knitwear factories. Priority is to be given to increasing the production of cotton textiles, followed by silk, polyester and viscose. In addition, measures are also being taken to enable a better targeting of foreign markets, and increased collection of information on prices and raw material availability. The Union of Textile Enterprises is also planning to establish marketing bureaus in Japan, the Republic of Korea, Taiwan Province of China, Malaysia, India and Germany.

An important role in the process of modernizing the Vietnamese textile industry and adjusting its outputs to the demand of the international markets is expected to be played by joint ventures with overseas firms. Several such ventures, most of which have been sited in the vicinity of Ho Chi Minh City, have already been arranged with counterparts from the United Kingdom, Malaysia, the Republic of Korea and Japan. Both because of its inherent dynamism and its special circumstances such as the proximity to an international harbour, Ho Chi Minh City is expected to attract the bulk of these foreign investments and play a leading role in the future development of Viet Nam's textile industry.

Clothing

The resource base

The textile industry described above provides the main resource base for the clothing industry, with an increasing number of textile firms setting up their own production lines for clothing. This development is motivated by two separate but related considerations. The first is a desire to exploit the synergy effects of company resources, while the second is the relatively low investment cost in the clothing industry relative to that prevailing in the textiles industry.

Recent industrial trends

Summary data of recent trends in the Vietnamese clothing industry are presented in Annex Table A-21. These indicate a steady annual growth of 6.4 per cent in the inflation adjusted value of the industry's output between 1980 and 1987, when the industry was estimated to have accounted for 2.3 per cent of GDP. A similar trend is exhibited by the data in Table IV.22, which shows that the output volume of most categories of goods produced by the clothing industry experienced a significant annual growth during the early and mid-1980s.

Table IV.22. Production of selected products in the clothing industry, 1980-1987

	Woven garment (million pieces)	Towels (million pieces)	Wool carpet ('000 square metre)	Finished garment (million pieces)
1980	13.8	24.8	375.8	69.2
1981	16.2	27.9	280	52.7
1982	16.8	32	269	55.3
1983	20.5	35	290	74.1
1984	21.7	46.2	302	70.7
1985	19.1	53.1	343	73.6
1986	20.1	57	476.1	102.3
1987	23.1	70.8	301.8	-3.1
Annual growth 1980-1987 (percentage)	7.6	16.2	-3.1	4.8

Source: State Planning Commission; Calculations of the IFO Institute.

Although precise data are not available, it nevertheless is true that the bulk of the output of the Vietnamese clothing industry originates from State-owned enterprises operated both by the central and provincial governments. Of these, 72 were in operation in 1987 with a total work force of 38,100. These State-owned firms were supplemented by 1,610 co-operatives and small privately-owned firms, which employed 39,500

persons but because of the artisanal nature of their production process accounted for only a relatively small proportion of total output.

The clothing industry is structured around the Viet Nam Union of Garment Factories, which brings together most of the larger centrally and locally operated State-owned firms and a few of the other enterprises in the industry. In addition to its membership from within the garment manufacturing industry, the Union also includes the Confectimex trading company responsible for managing the bulk of the industry's international trade, and two companies operated by the central government for the maintenance of the industry's equipment and the production of the necessary spare parts.

The central government operates 32 of Viet Nam's 72 State-owned firms in the clothing industry. These are currently equipped with a total of 8,000 sewing machines, of which about 25 per cent are specialized machines for the stitching of buttonholes and overlocks or for fulfilling other miscellaneous functions. Only about 20 per cent of this machinery is less than ten years old, with 10 per cent being older than 15 years. Approximately 50 per cent of the total output consists of suits, jackets and coats, and 30 per cent of ladies' wear. The remaining 20 per cent is accounted for by shirts (15 per cent) and trousers (5 per cent). In 1989 the total volume of output was estimated to have reached 40 million pieces.

Local governments operate a further 40 firms, which can produce about 30 million pieces of clothing per year. These firms are estimated to have a total of 10,000 sewing machines, of which 20 per cent are special-purpose machines. The age structure of this equipment is even less favourable than that of the machinery employed by firms operated by the central government, with only 10 per cent of all machines being less than 10 years old.

The total production capacity of the centrally and provincially operated State-owned industries is estimated at 70 million pieces. The latest available data indicate, however, that the industry only had orders for 60 million pieces. Of these, 20 million pieces were scheduled to be exported to the USSR, 10 million pieces to other socialist countries, and 1 million pieces to non-socialist countries. In addition, 20 million pieces were to be produced from cotton provided by socialist countries under agreements calling for this cotton to be returned as finished goods.

Major constraints and prospects

The heavy dependence of the clothing industry on exports to the socialist countries represents a major constraint to its future growth. Significant efforts are therefore beginning to be made to promote exports to the market economy countries, which the Vietnamese authorities hope will permit not only a substantial increase in foreign exchange earnings but also a major expansion of the industry itself. Current official projections therefore anticipate an eventual increase in the annual capacity of the clothing industry to 100 million pieces, and a growth of its work force to 1 million employees.

The achievement of these aims will depend to a considerable extent on the successful implementation of measures to raise the quality of the Vietnamese clothing industry's output to internationally acceptable levels. Special priority will therefore have to be given to the procurement of suitable raw materials and accessories for the production of such high quality goods, and increased attention will have to be paid to research on international fashion trends and markets. The establishment of joint ventures with foreign companies is seen as a particularly valuable step in this context. Two jointly-owned enterprises of this kind have already been established between State-owned firms and foreign investors from Hong Kong and Singapore, with the foreign party holding a 60 per cent equity stake in both cases. Some 10-20 joint ventures have also been established between privately-owned Vietnamese clothing manufacturers and foreign companies, some of which are owned by Vietnamese emigres.

C. METALLURGICAL AND ENGINEERING INDUSTRIES

Despite the strong emphasis given to the development of a heavy industrial sector by the authorities in northern Viet Nam since independence and in the southern part of the country since unification, the role of the metallurgical and engineering industries remains relatively small. It is also characterized by outdated machinery generally embodying a low level of technology and frequently suffering from inadequate levels of repair and maintenance. Though fairly diverse in terms of product categories, the output of these industries therefore often fall well short of available capacity and is usually of low quality by international standards.

Metallurgical industry

The resource base and recent industrial trends

Viet Nam is endowed with an extensive range of metallic minerals, including iron ore, tin, chromite, bauxite, manganese and titanium. To a considerable extent, however, these resources remain unexploited at present, largely because of low levels of investment in the mining industry. The resulting inadequacy of raw material supplies has played a significant part in inhibiting the development of the metallurgical and basic engineering industries, with its impact being reinforced by the unavailability of sufficient energy resources.

The metallurgical industry's flagship enterprises are two large iron and steel complexes, of which one is sited in Thai Nguyen in northern Viet Nam and the other in Bien Hoa in the south of the country. Both of these plants use local iron ore, of which Viet Nam has estimated reserves of 600 million tonnes, and together produce between 60,000 and 70,000 tonnes of steel per year. This output level represents only a fraction of their installed capacity, however, with the Thai Nguyen mill alone having a designed capacity of 130,000 tonnes/year of rolled steel but currently producing only about 35,000 tonnes/year.

The principal reason for this low level of capacity utilization is the fact that both plants use conventional blast furnace technology requiring large volumes of coking coal. Viet Nam possesses only limited domestic reserves of such coking coal, however, and has therefore traditionally relied on imported supplies from China to meet the bulk of the steel industry's needs. The Sino-Vietnamese war of February-March 1979 and the subsequent freeze in relations between the two countries resulted in an interruption of these imports, however, and severely strained Viet Nam's steel making abilities.

Some tentative steps have been taken over the years to lessen the dependence of the iron and steel industry on imported coking coal. In 1972 the Government of Viet Nam embarked on a multi-stage plan to substitute coking coal with anthracite, which is abundantly available in the country. In 1976 a pilot plant with a production capacity of 5 tonnes/day was established at the Thai Nguyen complex to test the feasibility of adopting direct reduction processing technology. Encouraged by results obtained at Sponge Iron India Ltd., the government has also decided to build a semi-industrial plant with a production capacity of 75 tonnes/day at Thai Nguyen. The UNDP and UNIDO have agreed to provide assistance (under project DP/VIE/86/031 "Experimental Production of Sponge Iron") to the Institute of Ferrous Metallurgy to adjust for design shortcomings at both plants and in monitoring and evaluating the new processes.

The most important secondary metallurgical industry is the foundry industry, which has a substantial direct impact on wider industrial and overall economic development because it provides a wide variety of basic products for the entire engineering industry. The range of items produced by this industry thus includes engine blocks, brake drums, frames for machine tools and other industrial equipment, construction materials such as pipe couplings, and spare part castings for all industries. The operations of the industry are hampered by input supply constraints resulting from the production shortfalls experienced by the upstream iron and steel industries, however, and consequently suffer from a substantial degree of overcapacity.

The production of tin, currently at a rate of some 500-700 tonnes/year, is another major activity of Viet Nam's metallurgical industry. The tin processing industry is based on the country's large reserves of tin ore, which are comparable to those found in the other countries of the south-east Asian tin belt - Indonesia, Malaysia and Thailand. Though similar in quantity, the Vietnamese reserves of tin ore are more widely dispersed and differ significantly in quality from those found elsewhere in the region. In particular, they have comparatively poor beneficiation characteristics and contain sufficiently large quantities of other valuable minerals such as wolframite, ilmenite, copper and silver to warrant the use of relatively sophisticated beneficiation and smelting technologies. The UNDP and UNIDO are expecting to provide technical assistance to the Institute of Non-Ferrous Metallurgy under project DP/VIE/86/032 for applied research in ore beneficiation, metallurgical processing and semi-final metal production.

The remainder of the metallurgical industry is essentially limited to the production of chromite. This is centred on the Co Dinh mine, which has an annual production capacity of 20,000 tonnes. Owing to market limitations, however, actual annual output levels have hovered in the range of approximately 3,000-3,500 tonnes in recent years.

Viet Nam possesses extensive and hitherto largely unexploited deposits of bauxite, which the government is now seeking to mine on an industrial scale as a prelude to the establishment of an alumina/aluminium

industry fuelled by the substantially increased quantities of hydro-electric power currently being brought on stream. Technical assistance is being provided in this connection by the UNDP and UNIDO to the State Copper and Aluminium Corporation for the establishment of a testing laboratory in the vicinity of the bauxite deposits to support geological explorations and ore evaluations. This project is intended to provide Viet Nam with the required technical ability to assess the applicability of various alternative processing technologies to the Vietnamese context, and to enhance the capabilities of the Vietnamese authorities to conduct feasibility studies for the establishment of industrial mining and processing facilities for bauxite.

Major constraints and prospects

The principal constraints facing the major components of the metallurgical industry are the raw material and energy shortages discussed above, which are often reinforced by inefficiencies arising from the use of outdated technology and poorly maintained equipment. The industry is therefore in considerable need of rehabilitation and make serious efforts to acquire new technology. This is particularly true of the iron and steel industry, the output of which the government is hoping to increase to 150,000 tonnes/year by the mid-1990s. Such an expansion of output can only be achieved through the adoption of radically different technologies from those presently in use, although the precise technologies to be chosen still remains uncertain.

The foundry industry faces a similar need for extensive restructuring to replace its current technology and improve its product quality, both of which are widely acknowledged to be sub-standard. The adoption of a special type of foundry technology known as "investment casting" appears likely to be particularly beneficial as it is well suited to the production of a variety of parts, including inexpensive hand tools, machinery spare parts, and other similar products that do not require the very high tolerances available only through machining. The use of such investment casting would make a major contribution towards meeting Viet Nam's considerable demand for basic hand tools and a wide range of spare parts.

Engineering industries

The resource base and recent industrial trends

The engineering/metalworking industry depends to a large extent on the indigenous metallurgical industries described above, and on the foundry industry in particularly, for its raw material supplies. It is a very important component of the manufacturing sector as a whole, and currently accounts for some 14 per cent of total manufacturing value added in Viet Nam. It also makes a significant contribution to labour absorption, and currently employs some 300,000 people throughout the country, of which about 30,000 are skilled workers.

The engineering industry consists essentially of small- and medium-scale enterprises. A substantial majority of even the approximately 600 centrally and locally managed State-owned firms in the industry are relatively modest operations, and as shown in Table IV.23 had a combined fixed asset base of only 420 million rubles/dollars in 1986. Only 180 of these firms (of which 107 are engaged in manufacturing and the remaining 73 in repairing activities) had fixed assets of more than 200,000 rubles/dollars, and only 20 could be regarded as being of medium-large scale with fixed assets of 4-60 million rubles/dollars.
In addition to the State-owned enterprises, the engineering industry comprises about 750 co-operatives, 3,800 other collective groupings, and an indeterminable number of largely family operated private ventures. The best available estimates suggest that the co-operatively and privately-owned fixed assets in the engineering industry account for about 10 per cent of the total investment resources in all branches of Vietnamese industry.

The products of the engineering industry span a wide range of categories. These include diesel engines of 6-50 hp, electric motors of 0.6-100 kW, electric transformers of 50-320 kVA, as well as water pumps with a pumping capacity of up to 8,000 cu m/hour. In addition, the industry also produces several varieties of transport equipment, including bicycles, tractors and coastal steamers and barges of 1,000 dwt. Agricultural equipment and machine tools of various kinds are also produced in significant quantities.

Table IV.23. Distribution of fixed assets among State-owned engineering firms, 1986

	Million rubles/$[a/]	Percentage share
Controlled by central government	307	73
of which		
Controlled by Ministry of Engineering and Metallurgy	113	27
Controlled by Ministry of Transport	118	28
Controlled by provincial government	113	27
Total	**420**	**100**

Source: United Nations Industrial Development Organization, *Viet Nam's Industrial Development - An Assessment*, Report by the Regional and Country Studies Branch,Industrial Policy and Perspectives Division, UNIDO, Vienna, August 1989, page 31.

a/ Transferable ruble valued at par with US dollar.

Major constraints and prospects

The principal constraint facing the engineering industry is the generally low level of technology and outdated equipment on which it must rely. The total stock of machine tools at the industry's disposal is estimated at approximately 40,000, of which 6,000 are geared to blacksmithing activities. The overwhelming majority of the available machine tools are of 1960s vintage and designed for small-scale jobs requiring low levels of precision. This imposes considerable limitations on the scope and size of the engineering industry's operations, which are exacerbated by a shortage of heating equipment and testing and measuring devices. It also impedes improvements in productivity and the achievement of high and consistent levels of product quality.

Because of the age of the machinery, constant maintenance is required to ensure its optimal operation. This is often rendered impossible, however, because of inadequate knowledge of modern preventative maintenance and rehabilitative technologies, and by serious shortages of spare parts and materials. These shortcomings are frequently compounded, moreover, by a general lack of interest in equipment maintenance.

In addition to the overriding problem of outdated and poorly maintained machinery, the engineering industry also suffers from a number of other weaknesses, the most important of which include the following:

- Many production units are not organized efficiently with regard to such matters as plant lay-out, materials flow and work organization.

- Most products manufactured by the engineering industry, including consumer goods like radios and industrial machinery like tools and agricultural equipment, are of old and outdated design. They make little use modern electronic parts and components, and generally cannot compete with foreign products on the basis of cost or quality.

- While the engineering industries in general have well qualified personnel with good knowledge of mechanical operations, there are serious weaknesses in the areas of material engineering and material sciences, such as the application of paints, coating, electro-plating, heat treatment, hardening and finishing, etc.

- The development of the industry is also hampered to a considerable extent by the lack of a comprehensive and uniform set of engineering standards.

An increasing consensus is beginning to emerge about the urgent need to overcome these constraints and initiate measures to rehabilitate and expand the engineering industry. As noted in a recent report compiled by a Swedish consultancy firm, the development of the engineering industry needs to be given high priority for the following four reasons:[24/]

- The future performance of the manufacturing sector will increasingly depend on the growth, efficiency and depth of the engineering industry.

- The strong backward and forward linkages of the engineering industries will stimulate growth elsewhere in the economy.

- The engineering industry provides entrepreneurial opportunities for relatively small-scale ventures.

- The engineering industry provides a significant potential for employment creation.

Specific areas for attention include the manufacture of improved agricultural machinery and processing equipment, such as rice drying equipment for use in rural areas and good quality sawmilling equipment. Particular attention also needs to be paid to an upgrading and expansion of Viet Nam's capacity for the production and repair of spare parts and components for a wide range of industries including rice, sugar and textile mills. In a country which depends heavily on bicycles for personal transport, considerable scope for improvement also remains in such areas as heat treatment and electro-plating.

A further area for development is the manufacture of intermediate goods used by such export oriented industries as food processing. Of particular importance in this context is a modernization of the production processes employed in the manufacture of tin cans. These are commonly made by the State-owned fruit and vegetable processing factories themselves using very simple raw materials and equipment such as uncoated tin materials and hand tools to spray varnish materials on the fabricated cans. The use of these methods, frequently in conjunction with improper varnish solutions for the packaging of acidic foods, results in the products of the canning industries falling short of international standards and being unexportable to the more sophisticated markets.

D. DOWNSTREAM OIL PROCESSING

The downstream oil processing industry is virtually non-existent in Viet Nam. As summarized in Table IV.24, however, Viet Nam's oil industry has experienced rapid growth during the past decade. Following the signing of numerous exploration agreements with foreign oil companies during the past three years as shown in Table IV.25, moreover, it is expected to expand even more rapidly in the future. One high-ranking Vietnamese official has even been cited as having referred to the oil industry as "the spearhead industry of Viet Nam's national economy".[25/] Against this background, the question about whether Viet Nam should invest in the establishment of a downstream processing industry has become a major point of debate in the country.

The resource base

In view of the only limited degree of exploration conducted to date in Viet Nam, any estimate of the country's total oil reserves must be subject to a considerable margin of error. Consequently, the available estimates range from 20 million barrels of proven recoverable reserves to 50-100 million barrels of probable reserves, with the latter estimate originating from the Soviet-Vietnamese joint venture firm Vietsovpetro, which has so far been the most active company in the Vietnamese oil industry and was the first firm to begin production from its Bach Ho field in 1986. Output from this offshore field has increased dramatically in recent years from a mere 1,000 b/day in 1986-87 to almost 40,000 b/day by the end of 1989, and official sources project that it will have risen further to 60,000 b/day by 1990-91, and 120,000 b/day by 1993. The rush of foreign investment interest in the oil industry following the introduction of the new foreign investment law in 1987 promises an even more rapid output growth in subsequent years as other fields are discovered and brought on stream.

Table IV.24. Chronology of Vietnamese oil industry

1970	Offshore exploration begun with law 011/70 allowing Exxon, Marathon, Mobil, Shell, Sunningdale and Union Texas to take concessions. Discoveries made in two fields, yielding approximately 2,000 barrel/day each.
1978	New concessions signed after 1970 agreements nullified. Consortia based on Agip, Bow Valley, Deminex and Elf join with the State-owned Vietnamese petroleum corporation Petro-Vietnam to drill 12 wells. Results disappointing.
1980	Viet Nam and USSR sign agreement on oil and gas exploration.
1981	Joint venture between State-owned Vietnamese and Soviet petroleum companies, Vietsovpetro, begins 1981-1985 exploration plan.
1983	First offshore wells sunk by Vietsovpetro.
1984	Oil discoveries announced.
1986	New five-year plan for 1986-1990 entails 400 per cent increase in Soviet investment. Bach Ho oil field starts producing from two platforms, with output estimated at 1,000 barrel/day of crude oil and 1,000 cf/day of gas. Total output amounts to 282,000 barrel/year. All production shipped to Singapore for refining.
1987	Two tanker loads of crude oil sold to Japanese refiners. Other cargoes continue to be shipped to Singapore. Total output rises to 1.05 million barrel/year.
1988	Hydrocarbons India Ltd. signs 25 year production agreement. Several other foreign companies sign exploration agreements.

Source: United Nations Industrial Development Organization, *Downstream Options in the Oil Industry for Viet Nam*, Report by the Regional and Country Studies Branch, Industrial Policy and Perspectives Division, UNIDO, Vienna, 10 May 1990, pages 3-4.

Table IV.25. Foreign exploration joint ventures or agreements in the Vietnamese oil industry

Year	Company	Details
1987	Kuwaiti Office of Investment Transcomin (Spain)	Up to $2 billion of infrastructure projects, including an oil refinery and plants for urea and sodium monoglutamate production. Current status of agreement unclear.
1988	Hydrocarbons India Ltd.	Drilling, seismic surveys, training; $5 million per year for five years.
	Shell Oil UK, Petrofina	25 year contract for 15,000 square kilometre in Hue Basin.
	ONGC (India)	$5 million/year in exploration.
	Total	25 year exploration contract in Gulf of Tongkin.
1989	BP Development Ltd.	25 year contract for offshore exploration, spending $60 million in first five years, near Da Nang.
	Enterprise Oil UK (70 per cent) Cie Europeen des Petroles (30 per cent)	Exploration of 9,000 square kilometre in South China Sea. Five year production agreement, extendable for 20 years. Envisages spending $600 million over five years.
	Clyde Petroleum Swedish Exploration Consortium	12,000 square kilometre blocks in Con Son Basin and Gulf Gulf of Tongkin.
	BHP (Australia)	25 year contract to explore 15,000 square kilometre near Da Nang. Commitment to spend $16 million over first five years.

Source: State Planning Commission and IFO Institute, as cited in United Nations Industrial Development Organization, *Downstream Options in the Oil Industry for Viet Nam*, UNIDO, Vienna, 10 May 1990, page 4.

Recent industrial trends

Following the inauguration of the Bach Ho oil field, all of the crude produced in that field was shipped to Singapore for processing by Shell. In December 1988, however, a refinery with an installed capacity of 40,000 tonnes/year was opened at Cat Hai in the vicinity of Ho Chi Minh City. This installation is owned by United Saigon Processing Enterprises (Saigonpetro) but was built by the French firm Serepco, which has a contract to operate it on behalf of Saigonpetro. It is specially designed to process the low-sulphur waxy oil obtained from Viet Nam's offshore fields, which has a high paraffin content.

A further expansion of Viet Nam's refining capacity to supplement the relatively small Cat Hai refinery is being actively considered by the Vietnamese authorities at present. The need for such an increase in refinery capacity is being argued on a number of grounds. These include not only the anticipated rise in Viet Nam's crude oil production, but also the expectation that an acceleration of economic growth in the coming years will stimulate a substantial increase in domestic demand for petroleum products, which as shown in Table IV.26 is currently well below the levels achieved in the early 1970s. In addition, the prospect of increased foreign exchange earnings generated by exports of refined products rather than crude oil also represents a major argument in favour of the establishment of a domestic refining industry to add value to Viet Nam's oil production.

Two major proposals to augment the Cat Hai refinery have been put forward so far. The first involves the construction of a 150,000 tonnes/year facility at Tuy Ha in co-operation with Vietsovpetro. The second scheme is considerably more ambitious, and envisages the installation of a 3 million tonnes/year refinery at Phu My. This project, if it proceeds, is also expected to be implemented in association with Vietsovpetro, although the State-owned Indian civil engineering firm Engineers India is reportedly hoping to be awarded the construction contract. In addition to these refining projects, the feasibility of establishing a comprehensive petrochemical complex at Thanh Tuy Ha is also being considered.

Table IV.26. Domestic consumption of petroleum products, 1973-1989

Year	('000 barrel/day)
1973	120
1980	25
1985	29
1986	30
1987	30
1989	50

Source: State Planning Commission and IFO Institute, as cited in United Nations Industrial Development Organization, *Downstream Options in the Oil Industry for Viet Nam*, UNIDO, Vienna, 10 May 1990, page 5.

Major constraints and prospects

The most obvious constraints inhibiting the implementation of the proposed refinery expansion programme are the severe shortages in Viet Nam of the capital and skilled manpower needed to build and operate petroleum refineries on the envisaged scale. Even if these physical constraints can be overcome in the short term by entering into collaborative ventures with foreign companies, the economic feasibility of such a programme of large-scale capital intensive needs to be assessed with great care in order to make optimal use of Viet Nam's scarce financial resources. The results of this assessment will be determined by a variety of exogenous and endogenous factors, including expected supply and demand developments inside and outside Viet Nam, anticipated economic and political effects on oil price movements, and the likely competitiveness of a domestic refinery industry against its overseas counterparts.

In this context, three basic options for the future development of the refining industry present themselves. The first of these is to refrain from expanding Viet Nam's refining capacity beyond its existing level. The second is to expand capacity, but only to a point which provides domestic self sufficiency. The third is to establish a substantial export oriented refining capacity. Beyond these fundamental decisions, careful consideration will also have to be given to the technical specification of the proposed refineries to ensure the optimal mix of output products for the market(s) which the expanded refinery system is intended to serve.

NOTES TO CHAPTER IV

1/ R. S. Garven, Agricultural and Food Production Sector Review - *Viet Nam - Report of the Agro-Industrial Sector*, State Planning Committee of the Socialist Republic of Viet Nam and Food and Agricultural Organization of the United Nations, DD/DP/VIE/88/033 Field Document No 2, Rome, July 1989, page 7.

2/ *Ibid*, page 8.

3/ *Ibid*, page 8.

4/ Harvey Demaine, "Viet-Nam - Economy", in *The Far East and Australasia 1990*, Europa Publications, London, 1989, page 1037.

5/ State Planning Committee, Socialist Republic of Viet Nam, and United Nations Development Programme, Food and Agriculture Organization of the United Nations, and the World Bank, *Viet Nam - Agricultural and Food Production Sector Review*, Draft Mission Report DD:DP/VIE/88/033, nd, page 38.

6/ R. S. Garven, Agricultural and Food Production Sector Review - *Viet Nam - Report of the Agro-Industrial Sector*, State Planning Committee of the Socialist Republic of Viet Nam and Food and Agricultural Organization of the United Nations, DD/DP/VIE/88/033 Field Document No 2, Rome, July 1989, pages 43-44.

7/ *Ibid*, page 67.

8/ *Ibid*, pages 46-47.

9/ *Ibid*, page 18.

10/ State Planning Committee, Socialist Republic of Viet Nam, and United Nations Development Programme, Food and Agriculture Organization of the United Nations, and the World Bank, *Viet Nam - Agricultural and Food Production Sector Review*, Draft Mission Report, DD/DP/VIE/88/033, nd, page 78.

11/ United Nations Industrial Development Organization, *Viet Nam's Industrial Development - An Assessment*, Report by the Regional and Country Studies Branch, Industrial Policy and Perspectives Division, UNIDO, Vienna, August 1989, page 98.

12/ R. S. Garven, Agricultural and Food Production Sector Review - *Viet Nam - Report of the Agro-Industrial Sector*, State Planning Committee of the Socialist Republic of Viet Nam and Food and Agricultural Organization of the United Nations, DD/DP/VIE/88/033 Field Document No 2, Rome, July 1989, page 20.

13/ United Nations Industrial Development Organization, *Viet Nam's Industrial Development - An Assessment*, Report by the Regional and Country Studies Branch, Industrial Policy and Perspectives Division, UNIDO, Vienna, August 1989, page 100.

14/ R. S. Garven, Agricultural and Food Production Sector Review - *Viet Nam - Report of the Agro-Industrial Sector*, State Planning Committee of the Socialist Republic of Viet Nam and Food and Agricultural Organization of the United Nations, DD/DP/VIE/88/033 Field Document No 2, Rome, July 1989, page 27.

15/ *Ibid*, pages 31-32.

16/ *Ibid*, page 32.

17/ *Ibid*, page 33.

18/ State Planning Committee, Socialist Republic of Viet Nam, and United Nations Development Programme, Food and Agriculture Organization of the United Nations, and the World Bank, *Viet Nam - Agricultural and Food Production Sector Review*, Draft Mission Report DD/DP/VIE/88/033, nd, page 84.

19/ *Ibid*, page 88.

20/ Finding of FAO study of Viet Nam's sawmilling industry, as cited in United Nations Industrial Development Organization, *Viet Nam's Industrial Development - An Assessment*, Report by the Regional and Country Studies Branch, Industrial Policy and Perspectives Division, UNIDO, Vienna, August 1989, page 108.

21/ Report of UNDP/FAO Forestry Programming Mission (VIE/085/003), as cited in United Nations Industrial Development Organization, *Viet Nam's Industrial Development - An Assessment*, Report by the Regional and Country Studies Branch, Industrial Policy and Perspectives Division, UNIDO, Vienna, August 1989, page 108.

22/ United Nations Industrial Development Organization, *The Textile and Clothing Industry in Viet Nam: A Filiere Approach*, Report by the Regional and Country Studies Branch, UNIDO, Vienna, 9 May 1990, page 26.

23/ *Ibid*, page 14.

24/ The Consultants for Trade and Industry AB, *Report on the Study of the Industry Sector in Viet Nam*, CTI, Stockholm, January 1990, pages 8-9.

25/ United Nations Industrial Development Organization, *Downstream Options in the Oil Industry for Viet Nam*, Report by the Regional and Country Studies Branch, UNIDO, Vienna, 10 May 1990, page 3.

ANNEX A

STATISTICAL TABLES

Annex Table A-1. Retail price index, 1981-1989[a/]
(Annual percentage change)

	1981	1982	1983	1984	1985	1986	1987	1988	1989
General price index	69.6	95.1	49.5	64.9	91.6	487.2	301.3	308.2	76.0
of which:									
Food-grains and foodstuffs	52.0	82.1	55.1	55.0	91.6	553.2	314.6	367.3	73.3
of which:									
Food-grains	46.8	52.8	34.4	62.0	188.3	254.2	405.1	446.4	...
Foodstuffs	52.6	85.6	57.3	48.5	81.8	591.6	287.3	340.5	...
Other consumer goods	95.1	105.4	38.8	79.9	90.8	422.7	289.3	265.0	79.8[b/]
Agricultural inputs	27.0	94.3	19.7	39.9	104.4	650.8	291.7	296.0	79.8[b/]
Official price index	102.0	141.8	42.8	55.8	110.9	457.4	289.9	313.2	...
of which:									
Food-grains and foodstuffs	60.0	117.9	50.1	55.1	110.8	546.4	311.2	378.5	...
of which:									
Food-grains	44.1	68.3	35.0	51.7	265.2	227.9	416.8	458.7	...
Foodstuffs	61.0	125.6	53.1	58.9	95.2	602.5	272.4	344.4	...
Other consumer goods	136.0	145.9	30.9	57.2	110.3	395.5	274.9	220.4	...
Agricultural inputs	22.0	150.0	1.5	53.2	120.9	592.0	270.2	287.6	...
Free market price index	47.4	65.0	57.5	76.3	54.7	582.3	337.5	294.8	...
of which:									
Food-grains and foodstuffs	47.8	64.2	59.5	54.5	60.2	568.9	322.5	341.0	...
of which:									
Food-grains	48.6	43.8	34.1	73.9	47.0	458.3	353.2	382.4	...
Foodstuffs	47.6	66.4	63.3	51.9	63.1	573.4	317.0	335.2	...
Other consumer goods	54.0	63.9	50.8	117.4	46.8	536.1	352.9	217.1	...
Agricultural inputs	31.1	66.0	63.9	26.9	79.5	791.7	342.1	315.0	...

Sources: Official data provided by Vietnamese authorities, as cited in International Monetary Fund, *Viet Nam - Recent Economic Developments*, Memo from the Secretary to members of the Executive Board dated May 11, 1988, page 15 (data for 1981-1987). Socialist Republic of Viet Nam, State Planning Committee and United Nations Development Programme, *Report on the Economy of Vietnam*, January 1990, page 49 (data for 1981-1988). Socialist Republic of Viet Nam, General Statistical Office, *Statistical Data of the Socialist Republic of Vietnam 1976-1989*, Statistical Publishing House, Hanoi, 1990, page 114 (data for 1989).

a/ The inflation estimates presented here are based on movements in the official retail price indices, which until 1988 comprised an overall general price index and two subsidiary indices for officially controlled prices of some 200-250 commodities and market determined prices of some 150-200 commodities. The general price index was calculated as a weighted average of the two component indices, with weights of 74 per cent and 26 per cent being assigned to the official and free market indices respectively. As measures of consumer price inflation these indices have several weaknesses, which include the fact that they contain some non-consumer goods such as agricultural inputs and omit consumer services. The suitability of the weighting system used in the computation of these indices is also open to question, since the weights are based on the relative sales values of the included commodities rather than on their relative importance in the household consumption budget. This multiple index was abandoned in early 1989, when the distinction between official and free market prices was dropped and a single-price system was introduced.

b/ "Other consumer goods" and "agricultural inputs" categories amalgamated in 1989.

Annex Table A-2. Balance of payments with the non-convertible area, 1983-1989[a/]
(Millions of transferable rubles)[b/]

	1983	1984	1985	1986[c/]	1987	1988	1989[d/]
Current account	-616	-703	-721	-1,224	-1,276	-1,335	...
of which:							
Trade balance	-616	-703	-721	-1,226	-1,295	-1,320	-954
of which:							
Exports	364	388	410	476	431	622	844
Imports	-980	-1,092	-1,131	-1,702	-1,726	-1,942	-1,798
Services and transfers (net)	-	-	-	2	19	-15	...
of which							
Interest payments	-	-	-	...	...	-97	...
Other	-	-	-	...	...	82	...
Capital account	616	703	721	1,224	1,150	1,130	...
of which:							
Receipt of loans	747	819	807	1,294	1,310	1,600	...
Scheduled repayments	-131	-116	-86	-70	-160	-408	...
Short term (net)	-	-	-	-	-	-62	...
Errors and omissions	-	-	-	-34	37	97	...
Overall balance (before relief)	-	-	-	-34	-89	-108	...
Financing	-	-	-	34	89	108	...
of which:							
Debt rescheduling	-	-	-	-	-	-	...
Change in arrears	-	-	-	34	89	108	...
Memorandum items:							
Debt service as percentage of exports							
Scheduled	...	30.7	21.5	14.7	37.1	81.2	...
Actual	...	30.7	21.5	7.6	16.5	63.8	...

Sources: Official data provided by Vietnamese authorities, as cited in International Monetary Fund, *Viet Nam - Recent Economic Developments*, Memo from the Secretary to members of the Executive Board dated May 11, 1988, page 32 (data for 1983), and Socialist Republic of Viet Nam, State Planning Committee and United Nations Development Programme, *Report on the Economy of Viet Nam*, January 1990, page 61 (data for 1984-1988). Socialist Republic of Viet Nam, General Statistical Office, *Statistical Data of the Socialist Republic of Vietnam 1976-1989*, Statistical Publishing House, Hanoi, 1990, pages 118 and 120 (data for 1989).

a/ Totals may not add due to rounding.

b/ Vietnamese authorities conventionally record trade and payments flows with the non-convertible and convertible areas in terms of transferable rubles and United States dollars respectively, with parity being assumed between the two currencies.

c/ In 1986 certain imports wholly financed by loans and transfers began to be included in official balance of payments statistics for the first time, resulting in an estimated increase of recorded imports by about 600 million transferable rubles.

d/ Data for 1989 not strictly comparable with data for earlier years because of break in series.

Annex Table A-3. Balance of payments with the convertible area, 1983-1989[a/]
(US$ million)

	1983	1984	1985	1986	1987	1988	1989[b/]
Current account	-114	-223	-170	-198	-84	-196	...
of which:							
Trade balance	-106	-192	-123	-146	-35	-138	331
of which:							
Exports	224	276	336	307	430	465	976
Imports	-330	-468	-459	-453	-465	-603	645
Services and transfers (net)	-8	-31	-47	-52	-49	-58	...
of which							
Interest payments	-73	-77	-90	-94	-94	-106	...
Private remittances	-	-	-	5	10	7	...
Official transfers	25	26	20	27	17	13	...
Non-factor services	40	20	23	10	18	28	...
Capital account	-34	-86	-91	-116	-151	-157	...
of which:							
Receipt of loans	53	25	51	10	28	60	...
Scheduled repayments	-129	-149	-197	-237	-166	-284	...
Short term (net)	42	38	55	111	-13	67	...
Errors and omissions	-26	-4	-9	-1	-12	-6	...
Overall balance (before relief)	-174	-313	-270	-315	-247	-359	...
Financing	174	313	270	315	247	359	...
of which:							
Rescheduling and arrears	177	215	284	317	247	359	...
Other	-3	98	-14	-2	-	-	...
Memorandum items:							
Debt service as percentage of merchandise exports							
Scheduled	90	226	286	331	260	390	...
Actual	13	41	23	19	24	31	...

Sources: Official data provided by Vietnamese authorities, as cited in International Monetary Fund, *Viet Nam - Recent Economic Developments*, Memo from the Secretary to members of the Executive Board dated May 11, 1988, page 32 (data for 1983), and Socialist Republic of Viet Nam, State Planning Committee and United Nations Development Programme, *Report on the Economy of Vietnam*, January 1990, page 62 (data for 1984-1988). Socialist Republic of Viet Nam, General Statistical Office, *Statistical Data of the Socialist Republic of Vietnam 1976-1989*, Statistical Publishing House, Hanoi, 1990, pages 118 and 120 (data for 1989).

a/ Totals may not add due to rounding.

b/ Data for 1989 not strictly comparable with data for earlier years because of break in series.

Annex Table A-4. Employment, 1984-1989[a/]

(Thousands of persons)

	1984	1985	1986	1987	1988	1989
Total employed labour force	25,114	26,025	27,399	27,968	28,922	28,745
(Per cent change)	3.1	3.6	5.3	2.1	3.4	-0.6
Distribution by institutional sector:						
State sector	3,586	3,744	3,960	4,033	4,284	...
of which:						
Central government	327	337	337	332	332	...
Local government	918	936	1,009	1,031	1,218	...
State enterprises	2,341	2,469	2,614	2,670	2,734	...
of which:						
Central management	1,196	1,289	1,257	1,209	1,255	...
Local management	1,147	1,180	1,357	2,670	2,734	...
Co-operatives	15,845	18,616	19,787	20,332	21,015	...
Private sector	5,683	3,665	3,652	3,603	3,623	...
Distribution by industrial sector:						
"Productive" sectors	23,341	24,257	25,553	26,053	26,941	26,898
of which:						
Agriculture	17,994	18,808	19,797	20,246	20,891	20,374
Forestry	165	171	177	173	211	97
Industry[b/]	2,685	2,800	2,917	3,047	3,150	3,367
Construction	797	832	882	825	856	581
Transportation	412	444	449	429	426	541
Telecommunication	39	40	37	42	40	35
Trade and material supply	1,225	1,117	1,258	1,268	1,331	1,880
Other	24	45	31	23	21	22
"Non-productive" sectors	1,773	1,768	1,845	1,915	1,980	1,847
of which:						
Public service and housing	252	228	235	253	...	...
Science	63	64	64	57	60	41
Education	656	683	706	750	830	738
Arts and culture	37	40	38	46	45	57
Public health	273	277	300	297	305	263
Finance	64	74	95	93	...	...
State management	288	289	273	289	247	305
Other	140	113	134	130	...	...
Memorandum items:						
Population	58,653	59,872	61,109	62,452	63,727	64,412
(Per cent change)	2.2	2.1	2.1	2.2	2.2	1.1
of which:						
Urban	11,102	11,360	11,817	12,271	12,662	12,737
Rural	47,551	48,512	49,292	50,181	51,065	50,630

Sources: Official data provided by Vietnamese authorities, as cited in Socialist Republic of Viet Nam, State Planning Committee and United Nations Development Programme, *Report on the Economy of Vietnam*, January 1990, page 40 (data for 1984-1988). Socialist Republic of Viet Nam, General Statistical Office, *Statistical Data of the Socialist Republic of Vietnam 1976-1989*, Statistical Publishing House, Hanoi, 1990, page 13 (data for 1988-89).

a/ Totals may not add due to rounding. Some totals do not add in original sources.

b/ Predominantly manufacturing.

Annex Table A-5. Industrial employment, 1976-1988[a/]
(Thousand persons)

	1976	1980	1985	1986	1987	1988
State-owned firms	519.2	643.5	773.7	810.2	860.2	843.9
By sector:						
Heavy industry	298.1	369.7	426.3	439.2	458.9	410.1
Light industry	221.1	273.8	347.4	371.0	401.4	433.8
By type of management:						
Central government	311.4	343.2	404.3	416.7	434.8	432.5
Local government	207.8	300.3	369.4	393.5	425.4	411.4
By industry:						
Electric power	19.2	18.9	23.6	25.7	26.8	28.4
Fuel	29.1	34.4	45.0	49.8	53.3	49.1
Metallurgy	22.2	27.8	26.9	25.1	26.7	27.6
Machinery, engineering	99.4	126.4	141.6	148.7	157.5	150.7
Chemical industry	45.5	48.8	64.1	67.1	70.0	70.7
Construction materials	59.5	92.4	97.9	105.9	108.7	108.8
Ceramics, glassware	9.2	16.4	21.4	21.7	21.8	22.1
Wood and products	63.3	67.0	82.5	81.1	84.0	51.1
Food and foodstuffs	65.6	76.3	103.6	110.6	122.5	131.4
Textiles, leather	87.6	110.3	137.2	144.1	155.4	170.7
Other	18.6	25.1	29.9	30.4	33.5	33.1
Co-operative and private firms	...	1,604.6	...	1,842.8	2,012.9	2,102.1
Total	...	2,248.1	...	2,653.0	2,837.1	2,946.0

Source: Data provided by Vietnamese authorities as cited in United Nations Industrial Development Organization, *Viet Nam's Industrial Development - An Assessment*, Report by the Regional and Country Studies Branch, Industrial Policy and Perspectives Division, UNIDO, Vienna, August 1989, page 25. Socialist Republic of Viet Nam, General Statistical Office, *Statistical Data of the Socialist Republic of Vietnam 1976-1989*, Statistical Publishing House, Hanoi, 1990, pages 89 and 91.

a/ Totals may not add due to rounding.

Annex Table A-6. Labour productivity, 1983-1987[a/]
(State sector only, thousand dong at constant 1982 prices)

	1983	1984	1985	1986	1987[b/]
Gross industrial production per employee	43.2	47.2	48.0	49.3	51.3
By sector:					
Heavy industry	27.7	29.8	30.3	30.5	30.8
Light industry	60.7	66.1	67.0	69.4	72.9
By type of management:					
Central government	100.2	107.1	110.4	117.0	112.1
Local government	33.0	36.4	37.2	37.9	40.0
Percentage change per annum	...	9.2	1.7	2.7	4.1
By sector:					
Heavy industry	...	7.6	1.7	0.7	1.0
Light industry	...	8.9	1.4	3.6	5.0
By type of management:					
Central government	...	6.9	3.1	6.0	-4.2
Local government	...	10.3	2.2	3.6	5.0

Source: Data provided by Vietnamese authorities as cited in United Nations Industrial Development Organization, *Viet Nam's Industrial Development - An Assessment*, Report by the Regional and Country Studies Branch, Industrial Policy and Perspectives Division, UNIDO, Vienna, August 1989, page 27.

a/ Totals may not add due to rounding.

b/ Estimate.

Annex Table A-7. The State budget, 1983-1989[a/]
(Billion dong)[b/]

	1983	1984	1985	1986	1987	1988	1989[d/]
Revenue	4.1	9.4	19.0	83.6	379.3	1,634	3,227
of which:							
Tax	1.5	2.0	3.1	18.3	67.7	391	1,020
Non-tax	2.6	7.4	15.9	65.3	311.6	1,243	2,307
of which:							
Transfers from State enterprises	2.6	6.8	14.7	60.4	284.8	971	1,690
Other	-	0.6	1.2	4.9	26.8	272	617
Expenditure	5.9	11.6	34.6	120.8	514.9	2,710	5,720
of which:							
Recurrent expenditure	3.9	8.9	23.9	87.4	398.8	2,161	4,480
of which:							
Wages and salaries	0.5	0.3	1.8	5.5	29.5	255	1,175
Subsidies[c/]	0.7	3.4	6.1	18.2	150.9	812	-
Interest	...	0.1	0.3	1.1	2.1	26	360
Other recurrent expenditure	2.7	5.1	15.7	62.6	216.3	1,068	2,945
Capital expenditure	2.0	2.7	10.7	33.4	116.1	549	1,500
Overall deficit	-1.8	-2.1	-15.7	-37.2	-135.7	-1,076	-2,393
Financing	1.8	2.1	15.7	37.2	135.7	1,076	2,393
of which:							
Foreign loans and grants	1.7	1.5	6.4	14.3	43.5	356	1,198
State Bank of Vietnam (net)	0.1	0.4	9.3	22.9	89.1	453	1,175
Bonds	-	0.2	-	-	3.0	27	...
Expenditure arrears	-	-	-	-	-	253	-
Memorandum items							
As percentage of expenditure:							
Overall deficit	-28.8	-18.1	-45.4	-30.8	-26.4	-39.7	-41.8
Recurrent expenditure	66.1	76.7	69.1	72.4	77.5	79.7	74.9
Capital expenditure	33.9	23.3	30.9	27.6	22.5	20.3	25.1
As percentage of overall deficit:							
Foreign loans and grants	94.1	71.4	40.8	38.4	32.1	33.1	45.2
State Bank of Vietnam (net)	5.9	19.0	59.2	61.6	65.7	41.8	54.1
Bonds	-	9.5	-	-	2.2	2.5	0.8

Sources: Official data provided by Vietnamese authorities, as cited in International Monetary Fund, *Viet Nam - Recent Economic Developments*, Memo from the Secretary to members of the Executive Board dated May 11, 1988, page 21 (data for 1983), and Socialist Republic of Viet Nam, State Planning Committee and United Nations Development Programme, *Report on the Economy of Vietnam*, January 1990, page 51 (data for 1984-89). Incompatibilities between the overlapping data for 1984-1988 between the two sources suggest that the link between the data for 1983 and 1984 presented here may be tenuous.

a/ Totals may not add due to rounding.

b/ Expressed in new dong; i. e. pre-1985 data divided by 10.

c/ Subsidies for basic consumer goods, exports, and losses of public enterprises.

d/ Estimate.

Annex Table A-8. Monetary survey, 1983-1990[a/]
(Billion dong, end of period)

	1983	1984	1985	1986	1987	1988	1989	1990
Net foreign assets	-1	-1	-12	-23	-210	-277	...	...
Net domestic assets	11	13	66	134	680	2,662	...	...
of which:								
Domestic credit	8	10	34	152	531	2,633	...	...
Government (net)	-	-	1	19	80	669	...	...
Other credit	7	9	33	134	451	1,964	...	...
of which:								
State enterprises	...	...	...	117	376	1,709	...	...
Co-operatives	...	...	...	13	44	171	...	...
Private sector	...	...	...	4	32	84	...	...
Other items	3	3	32	-18	149	29	...	...
Total liquidity (M2)	4	5	20	111	471	2,385	...	...
of which:								
Cash in circulation	1	2	5	55	205	1,024	...	...
Deposits	2	3	16	55	267	1,360	...	...

Sources: Official data provided by Vietnamese authorities, as cited in International Monetary Fund, *Viet Nam - Recent Economic Developments*, Memo from the Secretary to members of the Executive Board dated May 11, 1988, page 26 (data for 1983-85), and Socialist Republic of Viet Nam, State Planning Committee and United Nations Development Programme, *Report on the Economy of Vietnam*, January 1990, page 54 (data for 1986-1988).

a/ Totals may not add due to rounding.

Annex Table A-9. Research and Development personnel in Viet Nam, 1982

	Total	Of which: Post-graduate degree holders	Scientists and engineers	Technicians
Total Research and Development scientific and technical personnel	697,430	5,934	248,223	443,273
- of which engaged in Research and Development				
- Subtotal	21,907	957	12,078	8,872
- In percentage	3.14	16.12	4.86	2.00

Source: *Statistical Data 1930-1984*, Hanoi, Statistics Publishing House, 1985, (in Vietnamese), page 30.

Annex Table A-10. Gross national expenditures on Research and Development as percentage of GDP (estimates)

Year	
1965	0.49
1970	0.67
1975	0.54
1980	0.44
1985	0.70

Source: Estimates by the Institute for Science Management, State Commission for Science and Technology, Hanoi, 1988.

Annex Table A-11. Patents, filed and granted, in Viet Nam, from 1 January 1982 to 30 October 1987

	Total	Resident	Non-resident
Patent applications filed	367	360	7
Patents granted	35	33	2

Source: Institute for Science Management, State Commission for Science and Technology, Hanoi, 1988.

Annex Table A-12. Area cultivated to rice in Viet Nam, 1987
(Thousand hectare)

Regions	Cultivated area	Total area harvested	Cropping intensity
Northern Region	537.1	748.3	1.4
Red River Delta	586.8	1,053.5	1.8
Old 4th Region	420.0	687.0	1.6
Old 5th Region	271.8	461.6	1.7
Western Region	143.1	167.5	1.2
North Ho Chi Minh City	266.6	351.8	1.3
Mekong Delta	1,923.0	2,520.2	1.3
National	4,148.4	5,989.8	1.4

Source: State Planning Committee, Socialist Republic of Viet Nam, and United Nations Development Programme, Food and Agriculture Organization of the United Nations, and the World Bank, *Viet Nam - Agricuitural and Food Production Sector Review*, Draft Mission Report DD:DP/VIE/88/033, nd, page 38.

Annex Table A-13. Area, production and yields of rice, 1980-1995

	1980	1985	1988	1990[a/]	1995[a/]
Total					
Production ('000 tonnes)	11,647	15,875	17,000	18,286	20,542
Area ('000 hectare)	5,600	5,704	5,726	6,000	6,200
Yield (tonne/hectare)	2.1	2.8	3.0	3.0	3.3
Winter/Spring					
Production ('000 tonnes)	3,874	6,191	6,974	7,606	8,708
Area ('000 hectare)	1,707	1,765	1,882	2,050	2,150
Yield (tonnes/hectare)	2.3	3.5	3.7	3.7	4.1
Rainy Season					
Production ('000 tonnes)	6,180	6,828	6,647	6,600	7,084
Area ('000 hectare)	3,212	3,084	2,850	2,750	2,800
Yield (tonnes/hectare)	1.9	2.2	2.3	2.4	2.5
Summer/Autumn					
Production ('000 tonnes)	1,594	2,855	3,379	4,080	4,750
Area ('000 hectare)	681	857	994	1,200	1,250
Yield (tonnes/hectare)	2.3	3.3	3.4	3.4	3.8

Source: State Planning Committee, Socialist Republic of Viet Nam, and United Nations Development Programme, Food and Agriculture Organization of the United Nations, and the World Bank, *Viet Nam - Agricultural and Food Production Sector Review*, Draft Mission Report DD:DP/VIE/88/033, nd, page 66 (data for 1980, 1985, 1990 and 1995). Socialist Republic of Viet Nam, General Statistical Office, *Statistical Data of the Socialist Republic of Viet Nam 1976-1989*, Statistical Publishing House, Hanoi, 1990 pages 34-35.

a/ Projection.

Annex Table A-14. Rice recovery rates at State-owned mills, 1985
(45% broken content)

	Recovery rate (Percentage)
National average	66.4
Centrally owned (north)	70.6
Centrally owned (south)	69.0
Provincially owned (all)	66.0
Export quality rice (15% broken)[a/]	52-53
Head rice (whole rice without brokens)	50-53

Source: R.S.Garven, *Agricultural and Food Production Sector Review - Viet Nam - Report of the Agro-Industrial Sector*, State Planning Committee and FAO, Rome, July 1989, page 15.

a/ For repayment of rice loans.

Annex Table A-15. Estimated national rice recovery rate

	Paddy input (Tonnes)	Rice output (Tonnes)	Estimated recovery (Percentage)
Mechanical	10,151,130	6,579,213	64.8
Centrally owned	315,000	209,160	66.4
Provincially owned	3,122,100	2,073,074	66.4
Small scale	6,714,030	4,296,979	64.0
Manual	6,448,870	4,573,698	71.0
Total	**16,600,000**	**11,157,911**	**67.2**

Source: R.S.Garven, *Agricultural and Food Production Sector Review - Viet Nam - Report of the Agro-Industrial Sector*, State Planning Committee and FAO, Rome, July 1989, page 16.

Annex Table A-16. Estimated national sugar recovery rates

	Cane input (Tonnes)	Sugar output (Tonnes)	Sugar lost in bagasse (Tonnes)
Centrally owned	834,930	50,096 @ 6.0%	33,397 @ 4.0%
Provincially owned	1,391,550	83,500 @ 6.0%	55,662 @ 4.0%
Small scale	3,308,690	148,891 @ 4.5%	181,978 @ 5.5%
Total	**5,535,170**	**320,835 @ 5.8%**	**271,037 @ 4.9%**

Source: R.S.Garven, *Agricultural and Food Production Sector Review - Viet Nam - Report of the Agro-Industrial Sector*, State Planning Committee and FAO, Rome, July 1989, page 21.

Annex Table A-17. Age distribution of textile equipment

Name of the Factories	Spinning of cotton and mixture				Weaving of fabric				Dying and printing of fabric						
	total number of spindles	used for more than 20 years	used for more than 10 years	used for less than 10 years	total number of looms	used for more than 20 years	used for more than 10 years	used for less than 10 years	Total capacity mill. ms - p.a.	used for more than 20 years		used for more than 10 years		used for less than 10 years	
										Bleaching and dying	Printing	Bleaching and dying	Printing	Bleaching and dying	Printing
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Nam Dinh Text.Fact.	120000	20000	80000	20000	2200	1810	370	20	50	35	0	0	0	8	7
2. March 8th Text.Fact.	70000	52000	18000	0	1360	1360	0	0	42	27	7			2	6
3. Vinh Phu Text.Fact.	60000	0	60000	0	2000	.	2000	20	30	0	0	22	8	0	0
4. Viet Thang Text.Fact.	66000	66000	0	0	1500	1270	300	20	40	10	10	20	0	0	0
5. Thang Loi	129000	.	.	65000	1000	750	250	0	20	0	0	10	10	0	0
6. Phong Phu	20000	20000	0	0	480	400	70	20	20	20	0	0	0	0	0
7. Dong Nam	65000	30000		35000											
8. Khanh Hoi	10000	10000													
9. Nha Trang Spinning Fact.	100000	.		100000											
10. Hun Tho	20000	20000	0	0	500	400	0	100							
11. Hue Spinning Factory	51000	0	0	51000											
12. Vonh Spinning Fact.	53000	0	0	53000											
13. Hanoi Spinning Fact.	100000	0	0	100000											
14. Nam Dinh Silk Fct.					500	234	200	63	10	5	0	0	0	5	0
15. Ha Dong Text.& Dying					155	45	0	110	10	5	0	0	0	5	0
16. Dong A Text. Fact.					550	530	0		19	14	2	0	0	3	0
17. Phuoc Long Text.Fact.					728	508	200	20	30	20	0	10	0	0	0
18. Thanh Cong Text.Fact.					176	.	146	20	15	0	0	8	0	7	0
Knitting Factories:															
19. Dong Xuan					140	40	70	30							
20. Thanh Cong					20	0	0	20	1200 t	600	0	600 t	0	0	0
21. Dong Phuong					33	22	0	11							
22. Phuoc Long					40	30	0	10	800	.	0	200		600	0
Wool Spinning Fact.:															
23. Ha Dong									700 t p.a.			700 t p.a.			
24. Hai Phong									200 t p.a.	200	0	0	0	0	0
25. Bien Hoa															
26. Vinh Thinh															
27. Hanoi Thread Fact.									500tp.a.						
28. Thu Binh Jute Fact.	7000 t p.a.		7000 t p.a.						3000 t p.a.			3000 t p.a.			
Blanket Weaving Fact.															
29. Binh Loi Ind.Fabr.Fact.					60	60	0	0							
30. Hanoi Ind.Fabr.Fact.					180	180	0	0							

Source: State Planning Commission and IFO Institute, as cited in United Nations Industrial Development Organization, *The textile and clothing industry in Viet Nam: A filiere approach*, UNIDO, Vienna, 9 May 1990, page 18.

Annex Table A-18. Weaving facilities

Name of factories	Site	Designed number of machines	Actual number of machines	Designed capacity (mill.qm)	Actual production of 1988 (mill.qm)	Production/ capacity ratio (%)
March 8th Textile Factory	Hanoi	1,360	1,360	28.0	21,967	78
Vinh Phu Textile Factory	Vinh Phu	2,000	2,059	48.0	18,448	46
Nam Dinh Textile Factory	Nam Dinh	2,200	2,059	48.0	34,020	71
Hoa Tho Textile Factory	Da Nang	500	400	8.0	6,915	86
Nam Dinh Silk Factory	Nam Dinh	500	459	11.6	4,800	41
Industrial Fabrics Factory	Hanoi	100	70	3.2	1,132	35
Viet Thang Textile Factory	Ho Chi Minh City	1,500	1,300	35.0	22,054	63
Thang Loi Textile Factory	Ho Chi Minh City	1,000	800	18.5	11,816	64
Phong Phu Textile Factory	Ho Chi Minh City	480	465	10.0	7,595	76
Dong A Textile Factory	Ho Chi Minh City	550	504	10.0	3,449	34
Thanh Cong Textile Factory	Ho Chi Minh City	176+20	176+20	8.2	11,773	144
Phuoc Long Textile Factory	Ho Chi Minh City	728+40	711+40	24.0	16,904	70
Dong Phuong Textile Factory	Ho Chi Minh City	33 a/	33 a/	4.8	2,657	55
Production of sector (central)		11,094+9	9,954+93	249.3	163,490	66
Production of local sector b/				110,000		
Total production of fabrics					273,490	

Source: State Planning Commission and IFO Institute, as cited in United Nations Industrial Development Organization, *The textile and clothing industry in Viet Nam: A filiere approach*, UNIDO, Vienna, 9 May 1990, page 19.

a/ Knitting machines.

b/ Including also statal enterprises under the direct control of town, having about 3,000 weaving machines (looms) (50 per cent of this number have been used for more than 30 years, the remaining have been used for more than 20 years. The quantity of new machines is very small - about 20 machines). Number of looms in co-operative and private sector: about 20,000 looms, most of them are made from wood or are leg machines.

Annex Table A-19. Facilities of printing and dying fabrics

Name of factories	Site	Designed capacity (mill.qm)	Actual production of 1988 (mill.qm)	Production/ capacity ratio (%)
Nam Dinh Textile Factory	Nam Dinh Province	50	52,525	105
March 8th Textile Factory	Hanoi	42	27,459	65
Vinh Phu Textile Factory	Vinh Phu Province	50	23,061	46
Viet Thang Textile Factory	Ho Chi Minh City	40	30,568	76
Thang Loi Textile Factory	Ho Chi Minh City	30	14,771	49
Phong Phu Textile Factory	Ho Chi Minh City	20	11,494	57
Dong A Textile Factory	Ho Chi Minh City	16	4,312	27
Phuoc Long Textile Factory	Ho Chi Minh City	30	21,131	70
Nam Dinh Silk Factory	Nam Dinh City	10	9,302	93
Dong Phuong Textile Factory	Ho Chi Minh City	5	3,322	46
Ha Dong Dying Enterprise	Ha Dong Province	15	924	6
Thanh Cong Textile Factory	Ho Chi Minh City	10	14,667	147
Total		318	213,536	67

Source: State Planning Commission and IFO Institute, as cited in United Nations Industrial Development Organization, *The textile and clothing industry in Viet Nam: A filiere approach*, UNIDO, Vienna, 9 May 1990, page 20.

Annex Table A-20. Knitting factories in Viet Nam at present time (only strtal sector)

Name of factories	Production ability (tonnes p.a.)						Materials, products
	Round knitting			Longways knitting			
	Designed capacity	Actual production	Production/ capacity ratio (%)	Designed capacity	Actual production	Production/ capacity ratio (%)	
Dong Xuan knitting factory	3,000	2,000	67				) Knitted underwear of various
Thang Long	1,200	900	75				) kinds which is made of knitted
Thang Loi	700	450	64				) fabrics of 100 per cent cotton
Phu Xuan	200	200	100				) most of the products is for
Da Nang	200	200	100				) exporting
Thanh Cong	1,000	500	50				- Knitted fabrics and clothes made from Peco-, Petex fibres
Phuoc Long	500	500	100	1,000	500	50	- Knitted fabrics of various kinds made from Peco-, Petex and Patex fibres
Dong Phuong	1,000	500	50	600	300	50	- Kintted underwear made of 100 per cent cotton fibre and various kinds of fabrics, curtain and mosquito nets made from Petex and Patex
Hanoi October 10th				200	100	50	- Mosquito nets made from Patex and Patex
Xuan Dinh[a/]	200						- Stockings of various kinds made from Patex and cotton fibres
Hanoi Spinning[a/] factory	250						- Knitted underwear made of 100 per cent cotton
Vinh, Nghe Tinh Spinning factory	750						- Knitted clothes and underwear made of 100 per cent cotton
Hanoi May 19th Textile factory	750						
Hong Gam Textile factory (In Ho Chi Minh City)	2,000	1,000	50	1,000	500	50	- Various kinds of fabrics, knitted clothes made from Peco, Petex and Patex fibres
Total actual	9,800	6,250	64	2,800	1,400	50	
Total potential	11,750						

Source: State Planning Commission and IFO Institute, as cited in United Nations Industrial Development Organization, *The textile and clothing industry in Viet Nam: A filiere approach*, UNIDO, Vienna, 9 May 1990, page 21.

a/ The factories are under installation, production will be started in 1990.

Annex Table A-21. Official data of the clothing industry 1980-1987

	Unit	1980	1985	1986	1987	Growth 1980/87 % p.a.
Value of industrial production (fixed prices from 1982)						
State sector	Million dong	399	496	530	565	5.1
Local sector (incl. handicraft)	Million dong	1,387	1,703	1,983	2,200	6.8
Only handicraft	Million dong	1,019	1,280	1,415	1,491	5.6
Total	Million dong	1,786	2,199	2,513	2,765	6.4
Share of the total industrial production value - Total	Per cent	2.7	2.1	2.3	2.3	
Only handicraft	Per cent	3.8	2.8	2.9	2.8	
Number of state enterprises						
Central state sector	Number	43	13	13	15	
Local sector	Number	123	54	57	57	
Total	Number	166	67	70	72	
State home trading per capita fabric and silk	Million	2.1	3.8	3.6	3.4	7.1
Employment						
Industrial workforce						
Central state sector	Number	14,100	16,400	17,600	18,700	4.1
Local sector	Number	11,700	14,000	17,900	19,400	7.5
Total state	Number	25,800	30,400	35,500	38,100	5.7
Management workforce						
Central state sector	Number	1,700	2,300	2,400	2,200	3.8
Local sector	Number	1,700	1,800	2,400	2,100	3.1
Total state	Number	3,400	4,100	4,800	4,300	3.4
Skilled workforce of handicraft	Number		82,400	92,500	93,500	
Index of development (handicraft) 1980=100			126	139	146	

Source: State Planning Commission and IFO Institute, as cited in United Nations Industrial Development Organization, *The textile and clothing industry in Viet Nam: A filiere approach*, UNIDO, Vienna, 9 May 1990, page 24.

ANNEX B

INVESTMENT ENVIRONMENT

ANNEX B1

LAW ON FOREIGN INVESTMENT IN VIET NAM

With a view to expanding economic co-operation with foreign countries, achieving domestic economic development, stepping up exports based on effective exploitation of natural resources, manpower and other potentialities;

In accordance with Article 16, Article 21 and Article 83 of the Constitution of the socialist Republic of Viet Nam;

The present Law sets forth the provision concerning investment effected by foreign organizations or persons in the Socialist Republic of Viet Nam.

Chapter I
General provisions

Article 1.

The State of the Socialist Republic of Viet Nam welcomes and encourages investment by foreign organizations or persons of their capital and technology in Viet Nam on the principles of respect for the Independence and sovereignty of Viet Nam, observance of Vietnamese laws, equality and mutual benefit.

The State shall guarantee the ownership of invested capital and other rights of foreign organizations or persons and extend to the latter favourable conditions and easy formalities for their investment in Viet Nam.

Article 2.

For the purpose of this Law, the following terms shall have the respective meanings ascribed to them hereunder:

1) "foreign partner" refers to the party consisting of one or more economic organizations enjoying the status of juridical person(s), or foreign person(s).
2) "Vietnamese partner" refers to the party consisting of one or more Vietnamese economic organizations enjoying the status of juridical person(s). Private Vietnamese shall be allowed to share capital with Vietnamese economic organizations to form the "Vietnamese partner" to a co-operative business with the foreign partner.
3) "foreign investment" refers to direct introduction into Viet Nam by foreign organizations or persons of a capital in a foreign currency or any asset as may be approved by the Vietnamese Government for contractual business co-operation or for the establishment of a joint venture or an enterprise with 100 per cent foreign invested capital in accordance with the provisions of this Law;
4) "the two partners" refers to the Vietnamese partners and the foreign partner;
5) "business co-operation contract" refers to the contract between the foreign and Vietnamese partners for business co-operation;
6) "joint venture contract" refers to the contract between the foreign and Vietnamese partners for the establishment of a joint venture;
7) "capital contribution" refers to the contribution made by the foreign or Vietnamese partners to the capital of a joint venture, which forms part of this capital but does not include any loans or other credits provided to the joint venture;
8) "reinvestment" refers to the addition of any part of the investor's share of profits to his capital contribution to a joint venture or anew investment in Viet Nam in any of the forms mentioned in Article 4 of this Law;
9) "prescribed capital" refers to the initial capital of a joint venture mentioned in its charter;
10) "joint venture" refers to an enterprise jointly set up in Viet Nam by the foreign and Vietnamese partners, based on a joint venture contract or an agreement concluded between the Government of the Socialist Republic of Viet Nam and a foreign government to this effect;

11) "enterprise with 100 per cent foreign invested capital" refers to an enterprise which a foreign organization or person is authorized by the Government of the Socialist Republic of Viet Nam to establish on the territory of Viet Nam, the capital of which is wholly (100 per cent) owned by the same foreign organization or person;
12) "enterprise with foreign invested capital" refers to a joint venture and an enterprise with 100 per cent foreign invested capital.

Article 3.

Foreign organizations or persons may invest, in Viet Nam, in different sectors of the national economy.

The Vietnamese State encourages investment by foreign organizations or persons in the following sectors:

1) Implementation of major economic programmes, export production and production of import-substitution products.
2) High-technology industries using skilled labour; intensive investment for exploitation and exhaustive utilization of possibilities and for raising the output capacities of the existing economic establishments.
3) Labour-intensive production using materials and natural resources available in Viet Nam.
4) Building of infrastructure.
5) Foreign currency-earning services: tourism, ship-repair, airport, seaport services and other services.

A detailed list of those branches and sectors where foreign investment is encouraged shall be published by the State organ responsible for management of foreign investment.

Chapter II
Forms of investment

Article 4.

Investment in Viet Nam by foreign organizations or persons may be made in the following forms:

1) contractual business co-operation
2) joint venture enterprise or company, referred to as joint venture
3) private enterprise with 100 per cent foreign invested capital.

Article 5.

A foreign partner and a Vietnamese partners may enter into contractual business co-operation, such as production sharing and other forms of business co-operation.

The scope and line of business, the rights, obligations and liabilities of each of the two parties and the relationships between the two parties shall be mutually agreed upon and stated in the business co-operation contract.

Article 6.

The two partners may co-operate to establish a joint venture. The joint venture shall be a juridical person subject to the Vietnamese laws.

Article 7.

1) The capital contribution by a foreign partner to a joint venture may be made in the form of the following assets:

1. foreign currencies;
2. plant, other buildings, equipment, machinery, tools, components and spare parts;
3. patents, technical know-how, technological processes and technical services;

2) The capital contribution by the Vietnamese partner to a joint venture may be made in the form of the following assets:
   1. Vietnamese currency;
   2. natural resources;
   3. building materials, fittings and furnishings;
   4. rights to the use of land, water surface, sea surface;
   5. plant, other buildings, equipment, machinery and tools, components and spare parts;
   6. services for the construction and commissioning of the plant, patents, technical know-how, technological processes and technical services.

The two partners may mutually agree upon other forms of capital contribution.

Article 8.

There shall be no ceiling on the maximum contribution to the prescribed capital by a foreign partner to a joint venture which by mutual consent shall not, however, be less than thirty per cent (30%) of the combined capital of the two partners.

The value of the partners' respective capital contribution shall be assessed according to international market prices and expressed in the deed of establishment of the joint venture in Vietnamese currency or in a mutually agreed foreign currency.

Article 9.

Assets of the joint venture shall be insured by Viet Nam Insurance Company or by qualified insurance companies to be mutually agreed upon by both partners.

Article 10.

The profits and risks of a joint venture shall be shared by the two partners in proportion to their respective capital contributions.

Article 11.

The two partners to a joint venture shall mutually agree upon the percentages of products to be allocated for export and for consumption in Viet Nam respectively on the principle of self-provision in respect of foreign currency needs. Foreign currency earnings from exports and other sources shall be at least sufficient to meet all the foreign currency needs of the joint venture and ensure its normal operation and the benefits of the foreign partner.

Article 12.

The leading body of the joint venture shall be its board of management.

Each partners to the joint venture shall appoint their nominees to the Board of Management in proportion to their respective capital contribution to the venture, provided, however, that they shall each have at least two of their nominees on the Board.

The Chairman of the Board shall be appointed by both partners by mutual agreement.

The General Director and Deputy General Directors shall be nominated by the Board of Management to handle the daily business of the joint venture and shall be responsible to the Board of Management for the operation of the joint venture.

The General Director of the first Deputy General Director of the Board of Management shall be a Vietnamese citizen.

Article 13.

The most important matters related to the organization and operation of the joint venture, including the orientation of its activity, business planning, key personnel shall be decided by the Board of Management on the principle of unanimity.

Article 14.

Foreign organizations or persons may establish in Viet Nam private enterprises with the invested capital wholly (100 per cent) owned by them, in which case they shall assume full management of the enterprise, be subject to control of the State organ for management of foreign investment, be entitled to enjoy the rights and liable to carry out all obligations stated in the investment licence.

The enterprise shall be a juridical person subject to the laws of Viet Nam.

Article 15.

The duration of the enterprise with foreign invested capital shall not exceed twenty (20) years. When necessary, it may be extended for a longer period.

Article 16.

Vietnamese citizens shall be given priority in the recruitment of personnel for an enterprise with foreign invested capital.

When high technical qualifications are required for which Vietnamese personnel are not available, the enterprise may recruit expatriate personnel.

The rights and obligations of the Vietnamese personnel working in an enterprise with foreign investment shall be guaranteed by their labour contracts.

The salaries, wages and fringe benefits of the Vietnamese personnel shall be payable in Vietnamese currency originating from foreign currencies.

Article 17.

The enterprise with foreign invested capital shall open its account(s) in Vietnamese currency and in foreign currencies with the Bank for Foreign Trade of Viet Nam or with branches of foreign banks established in Viet Nam as may be approved by the State Bank of Viet Nam.

Article 18.

The enterprise with foreign invested capital shall keep its books of accounts following generally accepted international principles and standards approved by the Ministry of Finance of the Socialist Republic of Viet Nam and shall be subject to control by the financial authorities of Viet Nam.

Article 19.

The enterprise with foreign invested capital shall be established and authorized to operate, to transfer its capital and to dissolve itself according to its charter and in full accordance with Vietnamese laws.

The enterprise with foreign invested capital shall be come a juridical person from the date of registration of its charter with the State organ for management of foreign investment.

Chapter III
Investment guarantee

Article 20.

The Government of the Socialist Republic of Viet Nam shall guarantee a fair and equitable treatment in regard to any foreign organization or person investing in Viet Nam.

Article 21.

In the course of its investment in Viet Nam, the invested capital, property and assets of a foreign organization or person shall not be requisitioned or confiscated under administrative procedure. The enterprise with foreign invested capital shall not be nationalized.

Article 22.

The foreign organizations or persons investing in Viet Nam shall have the right to repatriate or remit abroad:

1) their share of the profits derived from business operation;
2) any approved payments due to them for provision of technology or services;
3) the principal and interest due on any loan made in the course of business operation;
4) their invested capital;
5) other sums of money and assets in their legal ownership.

Article 23.

The expatriate personnel working in Viet Nam for an enterprise with foreign invested capital or to carry out a business co-operation contract shall, after payment of income taxes prescribed by Vietnamese laws, be authorized to repatriate or remit abroad their incomes, in accordance with the provisions of the Foreign Exchange Control Regulation of Viet Nam.

Article 24.

The conversion of Vietnamese currency into a foreign currency shall be effected at the official exchange rate to be made public by the State Bank of Viet Nam.

Article 25.

Any dispute between the two partners arising out of a business co-operation contract or a joint venture contract as well as by dispute arising between a joint venture or a private enterprise with 100 per cent foreign invested capital and the Vietnamese economic institutions or between those enterprises shall be first resolved through mutual consultation and amicable settlement.

If, however, the two parties to a dispute fail to reach an agreement, the dispute shall be referred to the Vietnamese economic arbitration body or any other arbitration or law-enforcement institution as may be mutually agreed upon.

Chapter IV
Rights and obligations of the foreign organizations and persons investing in Viet Nam

Article 26.

The enterprise with foreign invested capital and the foreign partner operating under a business co-operation contract shall be liable to pay a corporate income tax amounting from 15 per cent to 25 per cent of the earned profits.

For oil and gas and some other valuable and rate resources, the income taxes shall be levied at higher rates in accordance with international practice.

Article 27.

Depending on the branch or sector of its investment, the scale of its capital investment, the volume of its exports, its nature and duration, a joint venture may be exempted by the State organ for management of foreign investment from payment of income tax for a maximum period of two years counting from the first profit-making year and allowed a 50 per cent reduction of income tax for a maximum period of two (2) succeeding years.

In the course of its operation, losses incurred by a joint venture in any tax year may be carried over to the next tax year and made up with the profits of the succeeding years but not exceeding five (5) years.

Article 28.

In exceptional cases where encouragement of investment is needed, reduction of income tax may be granted by the State organ for management of foreign investment up to 10 per cent of the earned profits and the period of income tax exemption or reduction may be extended for a longer period than that provided for in Article 27 of the present Law.

Article 29.

The enterprise with foreign invested capital and the foreign partner of a business co-operation contract shall be liable to pay rents for the use of land, water surface or sea surface in Viet Nam. In case of exploitation of natural resources, they shall have to pay a royalty.

Article 30.

After payment of its income tax, a joint venture shall use 5 per cent of its profits to set up a reserve fund. Such reserve fund shall be limited to 25 per cent of the prescribed capital of the venture. The percentage of profits which shall be used to set up other funds shall be determined by mutual agreement between the two partners and stated in the charter of the venture.

Article 31.

The enterprise with foreign invested capital shall deposit with the Vietnamese national budget the required sums to cover social insurance for the personnel of the enterprise in accordance with the provisions of Vietnamese laws.

Article 32.

When any foreign organization or foreign person reinvest part of their share of the profits, they may receive a refund by the tax authorities of the income tax already paid on the reinvested profits.

Article 33.

Upon repatriation or remittance of their profits abroad, the foreign organization or persons concerned shall be liable to pay a tax amounting from 5 per cent to 10 per cent of the actual amount of such repatriated or remitted profits.

A tax exemption or reduction may be granted by the State organ for management of foreign investment in exceptional cases where encouragement of investment is needed.

Article 34.

The enterprise with foreign invested capital shall be liable to take necessary steps for protection of the environment in the course of its operations.

Article 35.

Export and import duties on export/import products of the enterprise with foreign invested capital as well as those of contractual business co-operation shall be levied according to the Law on Export/Import Duties.

The State organ for management of foreign investment may decide a tax exemption or reduction in each individual case where investment is exceptionally encouraged.

Chapter V
State organ for management of foreign investment

Article 36.

The State organ for management of foreign investment of the government of the Socialist Republic of Viet Nam is vested with competence to solve matters related to the investment operation of foreign organizations and persons in Viet Nam.

The State organ for management of foreign investment shall have the following rights and responsibilities:

1) to assist and guide the potential foreign and Vietnamese partners in the negotiation and conclusion of business co-operation and joint venture contracts; to assist and guide foreign organizations or persons in the establishment in Viet Nam of private enterprises with 100 per cent foreign invested capital and to act as a focal point for settlement of all matters at the request of foreign investing organizations or persons.
2) to consider and approve business co-operation and joint venture contracts; authorize the establishment by foreign organizations or persons of private enterprises with 100 per cent foreign invested capital and approve the Charters of enterprises with foreign invested capital.
3) to decide and grant preferences to an enterprise with foreign invested capital and the foreign partner to a business co-operation contract.
4) to monitor and control the execution of business co-operation and joint venture contracts and the operation of the enterprises with 100 per cent foreign invested capital.
5) to analyse the economic activities of the enterprises with foreign invested capital.

Article 37.

An application for approval of a business co-operation or a joint venture contract, for the establishment of a private enterprise with 100 per cent foreign invested capital and for investment incentives shall be submitted by both partners or either partner or the foreign investing organizations or persons to the State organ for management of foreign investment. The application shall accompanied by the business co-operation contract or the joint venture contract, the charter of the joint venture or private enterprise with 100 per cent foreign

invested capital, the feasibility study of the project concerned and any related document as may be required by the State organ for management of foreign investment.

Article 38.

The application shall be considered by the State organ for management of foreign investment and its decision communicated to the partners concerned within three months from the date of receipt of the application. The approval shall be communicated in the form of an investment license.

Chapter VI
Final provisions

Article 39.

Pursuant to the provisions of the present Law, the Government of the Socialist Republic of Viet Nam, shall enact regulations to facilitate the overseas Vietnamese residents to make investment in Viet Nam as their contribution to national reconstruction.

Article 40.

Pursuant to the principles prescribed in the present Law, the Government of the Socialist Republic of Viet Nam may conclude with foreign governments agreements on co-operation and investment in accordance with the economic relations between Viet Nam and each foreign country.

Article 41.

The Regulations on Foreign Investment in the Socialist Republic of Viet Nam issued in conjunction with Government Decree No. 115/CP dated 18th April 1977 and other provisions contrary to the present Law are hereby repealed.

Article 42.

The Council of Ministers of the Socialist Republic of Viet nam shall issue detailed provisions for the implementation of the present Law.

The present Law was approved by the 7th Legislature of the National Assembly of the Socialist Republic of Viet Nam at its 2nd Session, on 29 the December 1987.

ANNEX B2

COMPARISON OF VIET NAM'S TAX HOLIDAYS WITH SELECTED ASIAN AND PACIFIC COUNTRIES

	Basis for remittances	Tax holidays (years)
Afghanistan	EC	8
Bangladesh	EC	4-8
People's Republic of China	Balanced	2
Territory of Hong Kong	NL	NA
India	Balanced	3
Indonesia	NL	5
Iran	NL	NA
Malaysia	NL	2-8
Republic of Korea	EC	5
Nepal	EC	5
Pakistan	EC	5
Philippines	NL	5
Singapore	NL	3
Sri Lanka	EC	5
Thailand	EC	3-8
Viet Nam	Balanced	2-4

Source: Christopher F. Bruton and Mathilde L. Genovese, "Vietnam: An Investor's Appraisal", *Business International* (Asia-Pacific), Hong Kong, June 1990, page 103.

NA = Not available.
NL = No limitation.
EC = Exchange controls.

ANNEX B3

COMPARISON OF VIET NAM'S INVESTMENT AND TECHNOLOGY TRANSFER STANDARDS WITH OTHER ASIAN AND PACIFIC COUNTRIES

	Patents	Trademarks	Royalties	Tie-ins
Afghanistan	Law	Law	NL/EC	NL/EC
Bangladesh	Law	Law	NL/EC	NL/EC
People's Republic of China	Law	Law	NL/EC	NL/EC
Territory of Hong Kong	Law	Law	NL	NL
Indonesia	No Law	Law/L	NL	NL
India	Law/L	Law/L	L/EC	NA
Iran	NA	NA	NA	NA
Republic of Korea	Law	Law	L	NL
Malaysia	Law	Law	NL	NL
Nepal	Law	Law	NL/EC	NL/EC
Pakistan	Law	Law	NL/EC	NL/EC
Philippines	Law	Law	NL	NL
Singapore	Law	Law	NL	NL
Sri Lanka	Law	Law	NL/EC	NL/EC
Thailand	Law/L	Law/L	NL/EC	NL/EC
Viet Nam	Law	Law	NL/EC	NL/EC

Source: Christopher F. Bruton and Mathilde L. Genovese, "Vietnam: An Investor's Appraisal", *Business International* (Asia-Pacific), Hong Kong, June 1990, page 104.

L = Limited.
NA = Not available.
NL = No limitation.
EC = Exchange controls.

ANNEX B4

THE APPROVED AND/OR OPERATIONAL TECHNICAL CO-OPERATION PROJECTS OF UNIDO

Project Number	Backstopping Responsibility	All.Acc.Code	Project Title
DP/VIE/80/027	IO/IIS/IMR	J12209	Production of wooden textile industry accessories
DP/VIE/80/028**	IO/T/MET	J13210	Manufacture of magnetic materials and components for use in electronic engineering
DP/VIE/80/030**	IO/T/CHEM	J13428	Pilot plant for scientific glass products
DP/VIE/80/032**	IO/T/CHEM	J13422	Pilot production of medicines using indigenous raw materials
DP/VIE/80/039**	IO/T/ENG	J13313	Electronic and optical maintenance and repair centre
DP/VIE/80/040*	IO/T/AGRO	J13103	Production of baker's yeast in Hanoi
DP/VIE/84/006*	IO/T/CHEM	J13422	Production of standards and reagents for quality control of medicines
DP/VIE/84/010**	IO/T/CHEM	J13422	Development of industrial production of essential oils, aromas and flavours
DP/VIE/85/001**	IO/T/CHEM	J13420	Development of dyes and pigments
DP/VIE/85/006**	IO/T/MET	J13207	Technical assistance for the establishment and operation of a laboratory for bauxite processing technology
DP/VIE/85/007**	IO/T/MET	J13209	Castings and heat treated products
DP/VIE/85/009*	IO/T/ENG	J13313	Assistance to the Maintenance and Repair Centre for testing and measuring equipment (CMR)
DP/VIE/85/010**	IO/T/ENG	J13313	Technology transfer for the design, test and pilot manufacture of high voltage power capacitors for electricity distribution system
DP/VIE/85/012**	IO/T/CHEM	J13420	Plastics Technology Centre
DP/VIE/85/013**	IO/T/AGRO	J13104	Assistance to applied research in the leather industry
DP/VIE/86/013**	IO/T/AGRO	J13103	Assistance to the Food Industries Research Institute (FIRI)
DP/VIE/86/014**	IO/T/AGRO	J13102	Research and development on various methods of spinning short staple cotton
DP/VIE/86/015*	IO/T/AGRO	J13102	Testing of textile raw materials, yarns and fabrics and product development

Project Number	Backstopping Responsibility	All.Acc.Code	Project Title
DP/VIE/86/016*	IO/T/CHEM	J13422	Pharmaceuticals from animal by-products
DU/VIE/86/029	IO/IIS/IMR	J12209	Reduction of forest timber wastage, and improved utilization of forest residues (Executing Agency: FAO)
DP/VIE/86/031**	IO/T/MET	J13208	Experimental production of sponge iron
DP/VIE/86/032**	IO/T/MET	J13207	Technical assistance for the establishment and operation of a laboratory for tin ore processing technology
DP/VIE/86/033*	IO/T/CHEM	J13422	Processing of aroma chemicals and fragrance materials
DP/VIE/86/034**	IO/T/CHEM	J13420	Improvement of the efficiency of lubricating oil usage and development of lubricating oil additives
DP/VIE/86/035**	IO/T/CHEM	J13420	Development of paint and glues from laccol modified epoxy resins
DP/VIE/86/037**	IO/IIS/INFR	J12102	Assistance to strengthen technical facilities for the national network for standardization, metrology and quality testing and calibration services (phase III) (continuation of DP/VIE/81/006)
DP/VIE/86/040*	IO/T/CHEM	J13420	Development of rubber seed oil and damar resin based paints
DP/VIE/86/042	IO/T/ENG	J13316	Hand-tools blanks and dies production - preparatory assistance (jointly backstopped with IO/T/MET)
DP/VIE/86/046**	IO/T/ENG	J13320	Packaging Technology and Development Centre
DP/VIE/87/001**	IO/T/ENG	J13316	Strengthening the Mechanical and Electrical Refrigeration Centre
DP/VIE/87/002*	IO/T/AGRO	J13103	Canning and quality control of marine products
DP/VIE/87/003	IO/IIS/INFR	J12103	Assistance to handicraft and small industry in Hai Phong - preparatory assistance
DP/VIE/87/009*	IO/T/AGRO	J13103	Strengthening quality control and testing facilities of non-alcoholic liquid foods including fish sauce and soy-bean sauce
DP/VIE/87/011*	IO/T/CHEM	J13420	Quality improvement of rubber products (see also US/VIE/89/167)
DP/VIE/87/013*	IO/T/ENG	J13316	Assistance to the Institute for Tropical Technology in Vietnam (ITTV) in the field of marine corrosion
DP/VIE/87/015**	IO/T/CHEM	J13420	Experimental production and quality improvement of pure chemicals and reagents at the Duc Giang Chemical Factory

Project Number	Backstopping Responsibility	All.Acc.Code	Project Title
DP/VIE/87/016**	IO/T/CHEM	J13420	Strengthening the Design Institute of Chemical Industry, Hanoi
DP/VIE/87/022	IO/T/MET	J13209	Establishment of a textile spare parts foundry with regional services and training foundry laboratory - preparatory assistance
DP/VIE/87/024	IO/T/ENG	J13312	Strengthening test capacity of bogies - preparatory assistance
DP/VIE/88/011	IO/T/ENG	J13313	Design and development of low-cost electronic instrument prototypes - preparatory assistance
DP/VIE/88/036**	IO/T/ENG	J13320	Demonstration tin plate coating plant and laboratory facilities
DP/VIE/89/007	PPD IPP/REG	E03200	National seminar and international forum on Viet Nam's industrial development - preparatory assistance
DP/VIE/89/012*	IPCT II/IPAP	G01400	Integrated programme for the identification, formulation and promotion of investment projects for Viet Nam (Forum of Investors)
DP/VIE/89/027**	IO/T/CHEM	J13428	Improved exploitation of marble and granite
US/VIE/89/167	IPCT II/IPAP	G01400	Project d'investissement entre le gouvernement vietnamien et un société belge dans le domaine du caoutchouc (related to DP/VIE/87/011)
US/VIE/89/238	IO/T/AGRO	J13103	Assistance préparatoire pour l'amélioration des moyens de transformation, de stockage et d'approvisionnement de crevettes dans le Delta du Mekong (under completion)
SI/VIE/89/801	IPCT II/IPAP	G01400	Assistance to formulate a joint venture agreement between the 'Compagnie du caoutchouc de DONG NAI' and a Belgium company on a rubber production
SI/VIE/89/802	IO/T/CHEM	J13424	Technical assistance for processing and use of coal briquettes in the domestic sector
XP/VIE/90/108	IO/T/CHEM	J13400	Training in implementation and monitoring UNIDO's technical co-operation programme
XP/VIE/90/157	IO/T/ENG	J13313	Fellowship in the field of energy management in small and medium-scale industries
SI/VIE/90/801	IO/T/CHEM	J13428	Improving the quality of ultramarine pigments

* Large-scale project (= total allotment $150,000 or above)
** Total allotment $1 million or above

ANNEX BS

LIST OF MANUFACTURING PROJECTS SEEKING EXTERNAL ASSISTANCE

UNIDO
UNDP

Socialist Republic of Viet Nam

VIET NAM INVESTMENT FORUM

Ho Chi Minh City
Viet Nam
11-15 March 1991

LIST OF PROJECTS

A profile of each project is available from the Industrial Investment Division, UNIDO
or
the UNIDO Investment Promotion Services

Issued by the Industrial Investment Division of UNIDO on the basis of information provided by the project sponsors. It is the wish of the project sponsors to present their projects in the present form. UNIDO, therefore, does not accept responsibility for any inaccuracy or incompleteness.

October 1990

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ISIC no.	Project no.	Project title/ Products and annual output	Location	Total investment (US$ million)	Type of foreign co-operation sought
1110/ 3113	VIE/1	Cultivation of flowers and vegetables Flowers: 9 million pieces Potatoes: 2,700 tons Fresh vegetables: 12,000 tons	Hanoi	1.18	Joint venture, technology, equipment, export marketing, expertise: training
1210/ 3511	2	Pine resin processing Gum resin: 2,300 tons Turpentine: 600 tons	Lam Dong Province	1.25	Joint venture, equipment, export marketing, expertise: management, technical, marketing, training
1210	3	Eucalyptus round timber and fire wood Eucalyptus round timber: 105,000 tons Fire wood: 36,000 ster	Quang Ninh Province	17.60	Joint venture, equipment, export marketing, expertise: management, marketing
1301/ 3509	4	Processing of sea shells and mother of pearl Capacity to be discussed with foreign partner	Hanoi	1.55	Joint venture, technology, equipment, export marketing, expertise: technical, marketing, training
2302	5	Exploitation and processing of lead 1,000 tons	Hanoi	2.00	Joint venture, technology, subcontracting, equipment, export marketing, expertise: technical, training
2302	6	Ilmenite concentrate and zirconium oxide Ilmenite concentrate: 10,000 tons Zirconium oxide: 2,000 tons	Hanoi	3.86	Joint venture, buyback, technology, equipment, export marketing, expertise: management, technical, marketing, training
2901/ 2902	7	Kaolin and pyrophyllite exploitation Kaolin: 5,000 tons Pyrophyllite: 15,000 tons	Quang Ninh Province	0.58	Joint venture, non-traditional financing, technology, equipment, export marketing
2909/ 3699	8	Production of quartz (1 KHz - 100 MHz) 100,000 units	Hanoi	1.09	Joint venture, technology, subcontracting, equipment, expertise: technical, training
3111/ 3231/ 3909	9	Frozen meat (pork, beef and duck), dried duck, duck down, salted cowhide Frozen/dried meat: 1,900 tons Duck down: 40 tons Cowhide: 43.2 tons	Long An	2.49	Joint venture, buyback, expertise: training
3111	10	Meat processing plant Pate, ham, sausages, etc.: 9,000 tons	Ho Chi Minh City	2.13	Joint venture, buyback/barter, technology, subcontracting, licensing, equipment, export marketing, expertise: management, technical, marketing, training
3113	11	Fruit juice canning 5 million cans	Phu Ly Ha Nam Ninh Prov.	2.95	Joint venture, buyback/barter, equipment, export marketing, expertise: management, technical, marketing
3113	12	Tropical fruit processing Condensed fruit juice: 10,000 tons Canned fruit: 10,000 tons Fruit juice in paper containers: 10,000 tons	Ho Chi Minh City	9.44	Joint venture, buyback, technology, subcontracting, licensing, equipment, export marketing, expertise: technical, marketing, training
3113	13	Fruit juice and tomato and chili paste Fruit juice: 300 tons Tomato paste: 500 tons Chili paste: 500 tons	Hanoi	2.05	Joint venture, technology, equipment, export marketing, expertise: management, technical, marketing, training
3114	14	Frozen shrimp and cuttlefish and dried cuttlefish Frozen shrimp: 1,200 tons Frozen cuttlefish: 120 tons Dried cuttlefish: 50 tons	Vinh City	4.07	Joint venture, barter, export marketing, expertise: management, technical, marketing, training
3114	15	Shrimp processing 1,000 tons	Dong Hoi Quang Binh Prov.	3.00	Joint venture, technology, export marketing, expertise: management, technical, marketing, training
3114	16	Frozen shrimp 365 tons	Thanh Hoa	1.18	Joint venture, export marketing, expertise: technical, marketing

3114	17	Shrimp farming/processing 500 tons	Quang Ngai	2.88	Joint venture, equipment, export marketing, expertise: technical, marketing
3114	18	Prawn and shrimp fingerlings Prawn fingerlings: 5 million pieces Shrimp fingerlings: 5 million pieces Compound feed: 1,000 tons	Haiphong	0.95	Joint venture, technology, licensing, equipment, export marketing, expertise: management, technical, marketing, training
3114	19	Shrimp farming/processing 300 tons	Quang Nai	1.30	Joint venture, counterpurchase, technology, equipment, expertise: technical, training
3114	20	Freshwater fish/shrimp farming/processing Shrimp fingerlings: 12 million pieces Fish fingerlings: 5 million pieces Fry 150 million pieces Shrimp: 100 tons Fish: 10 million pieces	Haiphong	0.54	Joint venture, buyback, equipment, export marketing, expertise: management, marketing
3114	21	Lobster and cuttlefish Lobster: 100 tons Cuttlefish: 100 tons	Binh Dinh Province	0.80	Joint venture, non-traditional financing, equipment, export marketing, expertise: technical, training
3114	22	Frozen seafood Frozen shrimp, fish, eel and crab and shrimp shell powder: 4,000 tons	Hinh Hai Province	4.91	Joint venture, barter, technology, equipment, export marketing, expertise: management, technical
3114	23	Frozen fish, shrimp and cuttlefish 5,500 tons	Ho Chi Minh City	3.85	Joint venture, buyback/barter, technology, equipment, subcontracting, export marketing, expertise: technical, management, marketing, training
3114	24	White shrimp processing 18,000 tons	Ho Chi Minh City	41.81	Joint venture, barter, technology, equipment, expertise: management, technical, training
3114	25	Coconut and peanut oil Coconut oil: 3,600 tons Peanut oil: 1,000 tons	Long An Province	0.75	Joint venture, non-traditional financing, export marketing, expertise: marketing, training
3115	26	Shelled dried cashew nuts and crude cashew nut oil Cashew nuts: 500 tons Cashew nut oil: 17.5 tons	Long An Province	1.59	Joint venture
3115	27	Groundnut oil processing Groundnut oil: 2,500 tons Oilcake: 3,000 tons	Thach Ha Nghe Tinh Province	3.53	Joint venture, barter, technology, licensing, equipment, export marketing, expertise: management, technical, marketing, training
3116/ 3529	28	Rice debunking processing line Debunked rice: 45,000 tons Bunk essential oil: 1,000 tons	Hai Hung Hai Hung Province	5.34	Joint venture, technology, equipment, export marketing, expertise: management, technical, marketing, training
3116	29	Bran oil extraction Bran oil: 2,700 tons Bran cake: 10,000 tons	Ho Chi Minh City	1.69	Long-term loans (inc. suppliers' credits), export marketing, expertise: technical, training
3121	30	Dried carrots 960 tons	Ho Chi Minh City	5.78	Joint venture, non-traditional financing, technology, subcontracting, equipment, export marketing, expertise: management, technical, marketing, training
3121	31	Tea planting and processing Planting of 1,000 ha with capacity of 12 tons/ha Dry tea (all types): 1,200 tons	Hanoi	7.37	Joint venture, non-traditional financing, technology, export marketing, expertise: management, technical, marketing, training
3121	32	Tea processing Black, green and CTC tea: 600 tons	Vinh City	1.37	Joint venture, barter, licensing, export marketing, expertise: marketing, training
3121	33	Black tea processing Black tea CTC and OTD: 2,000 tons	Lam Dong Province	4.33	Joint venture, technology, equipment, export marketing, expertise: management, technical, marketing, training

3121	34	Tea bags 2 g tea bags: 75 million pieces	Hanoi	1.62	Joint venture, buyback/barter/counterpurchase, technology, subcontracting, licensing, equipment, export marketing, expertise: technical, marketing, training
3121	35	Essence extraction Peppermint essence: 30 tons Citronella: 15 tons Cinnamon: 5 tons Oxiningredisium: 20 tons	Tan Dao District Vinh Phu Province	1.74	Joint venture, non-traditional financing, technology, equipment, export marketing, expertise: technical, marketing, training
3121	36	Cassava starch and maize flour Cassava starch: 3,000 tons Maize flour: 1,000 tons	Ha Bac	0.71	Joint venture, equipment, export marketing, expertise: technical, marketing, training
3122/ 3909	37	Feather processing and production of high-protein (25%) animal fodder Feathers: 75 tons Fodder (dry meal form): 3,000 tons	Thai Binh	1.14	Joint venture, buyback/counterpurchase, technology, equipment, export marketing, expertise: management, technical, marketing, training
3211	38	Wool spinning and weaving Wool material: 500,000 pieces Wool/synthetic fibre: 50 tons	Haiphong	3.52	Joint venture, buyback/barter, equipment, export marketing, expertise: management
3211	39	Spinning and weaving of yarn and fabric Fabric: 3.5 million sq m Yarn: 1,200 tons	Hanoi	14.13	Joint venture, non-traditional financing, technology, licensing, equipment, export marketing, expertise: management, technical, marketing, training
3211	40	Silk thread and fabric Silk thread: 87 tons Silk fabric: 976,000 m	Thai Binh	4.19	Joint venture, barter, technology, equipment, export marketing, expertise: marketing
3211	41	Silkworm farming and silk spinning Silk thread: 800 tons Silk fabric: 1.2 million m Silk fibre: 160 tons	Ha Nam Ninh	32.55	Joint venture, equipment, export marketing
3211	42	Silkworm farming and silk processing Silk: 100 tons	Ha Nam Ninh	2.10	Joint venture, buyback/barter, equipment, export marketing, expertise: management, technical, marketing, training
3211	43	Silk processing Silk: 100 tons Knot silk: 30 tons	Quang Ngai	1.38	Equipment, export marketing, expertise: training
3211	44	Nylon twine (210D/2-210D/18) 300 tons	Ho Chi Minh City	2.70	Joint venture
3211/ 3513	45	Cotton and polyester fabric Polyester fabric: 5.7 million m Cotton fabric: 4.3 million m	Ho Chi Minh City	11.75	Joint venture, technology, subcontracting, equipment, export marketing, expertise: management, technical, marketing
3211/ 3513	46	Cotton, polyester and silk fabric 10 million m	Ho Chi Minh City	15.31	Joint venture, buyback, equipment, export marketing
3211	47	Woolen cloth and fine cotton material Woolen cloth: 1.2 million pieces Fine cotton material: 400,000 pieces	Hanoi	4.81	Joint venture, barter, technology, licensing, expertise: management, technical, marketing, training
3211	48	Textile weaving, dyeing and finishing 5,000,000 m	Ho Chi Minh City	12.68	Joint venture, licensing, equipment, export marketing, expertise: technical
3211	49	Elastic tape Flat elastic tape: 15 million m Round elastic tape: 5 million m	Hanoi	0.97	Joint venture, barter, technology, licensing, equipment, expertise: technical, marketing, training
3212	50	Curtains and lace 15,000 sq m	Haiphong	0.24	Joint venture, non-traditional financing, technology, equipment, export marketing, expertise: technical, marketing
3212/ 3213	51	Towels (40 x 80 cm) 30 million pieces	Ho Chi Minh City	11.96	Joint venture, subcontracting, equipment, export marketing, expertise: technical, marketing, training

3212/ 3213	52	Towels (28 x 28 cm) 35 million pieces	Ho Chi Minh City	5.50	Joint venture, buyback, subcontracting, equipment, export marketing, expertise: management, technical, marketing, training
3213	53	Cotton and synthetic fibre knitwear Underwear: 9.2 million pieces Garments: 11 million pieces Leisure wear: 2.8 million pieces	Hanoi	15.38	Joint venture, technology, subcontracting, licensing, equipment, export marketing, expertise: management, technical, marketing, training
3220	54	Children's, ladies' and men's clothing Production to be determined according to demand	Viet Tri Vinh Phu Province	1.16	Joint venture, non-traditional financing, technology, subcontracting, expertise: management, technical, marketing, training
3220	55	Garments Shirts, blouses, trousers, embroidered dresses and shirts, jackets and coats: 5 million pieces	Hanoi	5.32	Joint venture, non-traditional financing, technology, subcontracting, licensing, equipment, export marketing, expertise: management, technical, marketing, training, provision of raw materials
3220	56	Jeans 3 million pieces	Hanoi	8.08	Joint venture, non-traditional financing, subcontracting, equipment, export marketing, expertise: technical, marketing
3220	57	Clothing High quality clothing, dresses, overalls: 3 million pieces	Thanh Hoa Province	1.08	Joint venture, technology, subcontracting, licensing, equipment, export marketing, expertize: technical, marketing, training
3220	58	Garments Shirts, blouses, T-shirts and jackets: 3 million pieces	Ho Chi Minh City	5.03	Joint venture, non-traditional financing, technology, subcontracting, licensing, equipment, export marketing, expertise: management, technical, marketing, training
3220	59	Jackets Spring and winter jackets: 1 million pieces	Ho Chi Minh City	7.00	Joint venture, technology, equipment, export marketing, expertise: management, technical
3220	60	Garments High quality garments, leisure wear, work clothes, leather shoe covers: 4 million pieces	Thanh Hoa Province	2.62	Joint venture, buyback/barter/counterpurchase, technology, subcontracting, licensing, equipment, export marketing, expertise: management, technical, marketing
3220	61	Jackets and shirts 1 million pieces	Ho Chi Minh City	3.00	Joint venture, technology, licensing, equipment, export marketing, expertise: technical
3220	62	Garments Shirts, dresses, sweaters, underwear and children's clothing: 1.6 million pieces	Ho Chi Minh City	1.37	Joint venture, buyback, subcontracting, equipment, export marketing, expertise: management, technical, training
3220	63	T-shirts and polo shirts T-shirts: 3 million pieces Polo shirts: 1 million pieces	Ho Chi Minh City	6.23	Joint venture, technology, equipment, export marketing, expertise: management, technical
3231	64	Tanned leather Wet blue hides: 1,000 tons Chrome tanned leather: 50 million sq dm Tannin tanned leather: 200 tons	Hanoi	10.00	Joint venture, buyback/barter, technology, equipment, export marketing, expertise: management, technical, marketing, training
3231/ 3233	65	Finished tanned leather and leather products Finished tanned leather: 1,000 tons Leather products: 200 tons	Binh Dinh	2.86	Joint venture, buyback, subcontracting, equipment, export marketing, expertise: management, technical, marketing, training
3231	66	Tanned leather 450 tons	Ho Chi Minh City	4.28	Joint venture, licensing, equipment, export marketing, expertise: management, technical
3233/ 3240	67	Production of leather Box calf: 2 million pied (30 x 30 cm) Pig skin: 1 million pied	Haiphong	5.20	Joint venture, technology, subcontracting, equipment, expertise: management, technical, marketing, training
3240	68	Sports shoes 1 million pairs	Hanoi	4.43	Joint venture, technology, subcontracting, licensing, equipment, export marketing, expertise: management, technical, marketing, training
3240	69	Leather shoe uppers and complete shoes Shoe uppers: 3 million pieces Complete shoes: 1 million pairs	Hanoi	7.55	Joint venture, technology, equipment, expertise: technical, marketing, training

3240	70	Leather/artificial leather shoes 1.5 million pairs	Ho Chi Minh City	2.56	Joint venture, barter, technology, subcontracting, equipment, expertise: technical, marketing
3240	71	Leather and sports shoes 2 million pairs	Haiphong	4.55	Joint venture, technology, subcontracting, equipment, expertise: management, technical, marketing, training
3240/ 3559	72	Cloth shoes and rubber boots Cloth shoes: 2 million pairs Rubber boots: 100,000 pairs	Ho Chi Minh City	2.47	Joint venture, buyback, technology, equipment, export marketing, expertise: technical, marketing, training
3240	73	Leather and sports shoes Ladies' leather shoes: 300,000 pairs Sports shoes: 600,000 pairs	Ho Chi Minh City	1.64	Joint venture, technology, subcontracting, equipment, export marketing, expertise: management, technical, marketing, training
3240	74	Sports shoes 1.5 million pairs	Vinh City	2.05	Joint venture, barter, licensing, equipment, export marketing, expertise: technical, marketing, training
3240	75	Sports shoes 1 million pairs	Nghe Tinh	2.30	Joint venture, technology, equipment, export marketing, expertise: management, technical, marketing, training
3240/ 3220	76	Sports shoes and work gloves Sports shoes: 1 million pairs Work gloves: 500,000 pairs	Hanoi	2.02	Joint venture, technology, equipment, export marketing, expertise: management, technical, marketing, training
3240/ 3220/ 3312/ 3909	77	Development of industrial estate producing footwear and garments (1 million pieces), bamboo mats (1,500 pieces), and duck feathers (120 tons)	Ho Chi Minh City	3.30	Joint venture, technology, licensing, equipment, export marketing
3311	78	Plywood 7,000 cu m	Ha Nang Province	0.97	Joint venture, buyback, technology, equipment, expertise: management, technical, marketing
3311/ 3320	79	Wood blocks and wooden furniture Wood blocks: 57,000 cu m Furniture: 2,850 cu m	Dong Nai	3.56	Joint venture
3311/ 3320	80	Roofing, flooring and covering elements for walls and ceilings Roofing: 1.2 million sq m Flooring: 0.6 million sq m Wall elements: 1.2 million sq m Ceiling elements: 0.6 million sq m	Hanoi	1.95	Joint venture, buyback/barter/counterpurchase, equipment, export marketing, expertise: management, technical, marketing, training
3311/ 3312/ 3320	81	Wood products/furniture and rattan products Timber: 3,000 cu m Floor boards: 1,000 cu m Inlaid wood furniture: 500 cu m Rattan products: 100,000 pieces	Vinh City	1.24	Joint venture, barter, technology, equipment, export marketing, expertise: technical, marketing, training
3311/ 3319	82	Wood products Sawn timber: 3,400 cu m Wooden lattices: 30,000 pieces Wooden screens: 15,000 pieces Flooring: 600 cu m	Ho Chi Minh City	1.00	Joint venture, barter, technology, subcontracting, equipment, export marketing, expertise: management, technical, marketing
3311/ 3320/	83	Production line for timber products Timber flooring: 2,500 m3 Sawn timber: 2,500 m3 Sliding chairs: 22,000 units Fine sawn timber: 90,000 units Furniture for export: 600 m3	Hoang Lien Son	0.84	Joint venture, buyback, subcontracting, equipment, export marketing
3311/ 3320	84	Wood products Panels: 6,000 cu m Furniture: 1,240 cu m Finished parquet: 8,000 cu m Pellets: 24,000 cu m	Ho Chi Minh City	8.76	Joint venture, buyback/barter, technology, subcontracting, equipment, export marketing, expertise: management, technical, marketing, training
3411	85	Reforestation to obtain raw material for the paper industry 10,000 ha of eucalyptus and acacia yielding 1.2 million tons of wood	Ho Chi Minh City	11.37	Joint venture, non-traditional financing, equipment, export marketing, expertise: marketing

3411	86	Pulp and paper Pulp: 45,000 tons Insulation paper: 3,000 tons High quality paper: 2,500 tons	Lam Dong	14.49	Joint venture, buyback, technology, equipment, export marketing, expertise: management, technical, marketing, training
3411/ 3412	87	Toilet paper and duplex carton Toilet paper: 600 tons Duplex carton: 1,500 tons	Hanoi	2.73	Joint venture, technology, equipment, expertise: management, technical, marketing, training
3412	88	Packaging material Packaging material for cement: 30,000 tonss Paperboard: 20,000 tons Boxes and cartons: 10,000 tons	Thanh Hoa	145.10	Joint venture, technology, licensing, equipment, expertise: management, technical, training
3412/ 3560/ 3529	89	Packaging material Carton packaging: 15,000 tons Simple packaging: 200 tons Plastic packaging: 200 tons Adhesive tape: 240 tons	Dong Nai	6.82	Joint venture, technology, subcontracting, licensing, equipment, export marketing, expertise: technical, marketing
3420	90	Plate making Laser letter plate pages: 230,000 Graphic plate pages: 75,000 Proof printing pages: 300,000 Designed pages: 15,000	Ho Chi Minh City	3.05	Joint venture, equipment, expertise: technical, training
3511/ 3523	91	Glycerine, sodium alkyl-sulphate and fatty alcohol Glycerine: 150 tons Sodium alkyl-sulphate: 100 tons Fatty alcohol: 1,200 tons	Cuu Long	3.93	Joint venture, technology, equipment, expertise: management, technical, marketing, training
3511	92	Hydrogen peroxide 3,000 tons	Ho Chi Minh City	4.97	Joint venture, buyback, technology, equipment, export marketing, expertise: management, technical, marketing, training
3511	93	Soda chlorous Soda: 30,000 tons PVC powder: 20,000 tons HCl acid: 20,000 tons Chlorous rubber: 5,000 tons Chlorous liquid: 2,000 tons	Ho Chi Minh City	13.74	Joint venture, technology, equipment, expertise: management, technical, marketing, training
3511	94	Sodium hydroxide and chloric products 30-48% sodium hydroxide liquid, liquid chlorine silicon matri, chloric acid, detergent, chloride rubber and other products: 27,300 tons	Dong Nai	20.18	Joint venture, technology, licensing, equipment, export marketing, expertise: management, technical, marketing, training
3511	95	Soda and calcium carbide Soda: 100,000 tons Calcium carbide: 25,000 tons	Ngho Tinh	103.63	Joint venture, technology, equipment, export marketing, expertise: management, technical, marketing, training
3511	96	Aluminium hydroxide 22,600 tons	Ho Chi Minh City	4.37	Joint venture, counterpurchase, technology, equipment, export marketing, expertise: management, technical, marketing, training
3511	97	Alkylbenzene sulphuric acid 10,000 tons	Ho Chi Minh City	4.95	Joint venture, technology, licensing, equipment, export marketing, expertise: management, technical, marketing, training
3511	98	Insecticide, acetic acid, formaldehyde and sodium sulphate Insecticide: 600 tons Acetic acid: 3,000 tons Formaldehyde: 1,500 tons Sodium sulphate: 5,000 tons	Hanoi	To be determined	Joint venture, non-traditional financing, technology, equipment, export marketing, expertise: technical
3511/ 3512	99	Oxygen and nitrogen fertilizer Oxygen: 525,000 cu m Fertilizer: 50 tons	Ho Chi Minh City	1.08	Joint venture, technology, licensing, equipment
3512	100	Methanidophos insecticide 1,000 tons	Song Be	2.33	Joint venture, buyback

3512	101	Biological fertilizer 100,000 tons	Dong Nai	6.04	Joint venture, non-traditional financing, technology, equipment, export marketing, expertise: technical, marketing, training
3513	102	PVC and plastic pipes PVC and plastic pipes (21-600 mm): 3,000 tons Accessories: 300 tons	Hanoi	3.86	Joint venture, technology, equipment, expertise: management, technical, marketing, training
3513/ 3560	103	Plastic and PVC products Corrugated sheets: 150 tons Laminated plastic sheets: 100 tons PVC water pipes (20-250 mm): 150 tons Plastic products for household and industrial use (buckets, etc): 600 tons	Ho Chi Minh City	2.22	Joint venture, buyback, technology, equipment, export marketing, expertise: technical, training
3513	104	PVC roof and (UPP) corrugated sheets 420,000 pieces	Ho Chi Minh City	1.13	Joint venture, licensing, expertise: training
3513/ 3819	105	Bakelite electrical accessories 1-5 mm bakelite: 100,000 sq m 1-3 mm bakelite copper covering: 50,000 sq m	Hanoi	1.64	Joint venture, technology, subcontracting, equipment, export marketing, expertise: technical, training
3521	106	Ship coating paint 2,000 tons	Haiphong	2.05	Joint venture, technology, equipment, expertise: technical
3522	107	Pharmaceutical products Tablets: 1 billion units Injections: 100 million units	Ho Chi Minh City	3.90	Joint venture, equipment
3522	108	Paracetamol 250 tons	Ho Chi Minh City	3.20	Joint venture, expertise: technical
3522	109	Infusion fluid Hormin solution: 282,000 bottles (500 ml) Glucose solution: 498,000 bottles (500 ml) NaCl solution: 99,200 bottles (500 ml)	Hanoi	1.48	Joint venture, counterpurchase, technology, equipment, expertise: technical, training
3529	110	Ground water treatment Potable water: 100,000 cu m/day	Ho Chi Minh City	21.00	Equipment, expertise: technical, training
3529	111	Citronella ethereal oil 200 tons	Song Be	1.76	Joint venture, equipment, export marketing, expertise: management, technical, marketing, training
3529	112	Circle rubber for paint and printing ink production 300 tons	Hanoi	1.58	Joint venture, barter, technology, equipment, export marketing, expertise: management, technical, marketing
3551/ 3559/ 3560	113	Rubber processing and plastic products Processed rubber: 9,000 tons Rubber tyres: 900,000 sets Plastic products (tables, chairs, raincoats): 600,000 pieces Water pipes: 1.5 million m	Ho Chi Minh City	4.00	Joint venture, licensing, export marketing
3559/ 3320/ 1210	114	La. . .d rubber products Rubber gloves: 30 million pairs Rubber mattresses: 15,000 pieces Foam rubber sheets: 450,000 sq m Rubber bathing caps: 1.2 million pieces Centrifuged later: 7,620 tons	Song Be Province	4.70	Joint venture, non-traditional financing, technology, equipment, export marketing, expertise: management, technical, marketing
3559	115	Rubber boots 600,000 pairs	Hanoi	1.14	Joint venture, technology, equipment, export marketing, expertise: management, technical, marketing, training
3560	116	PVC paving tiles (1.2, 1.5 and 2 mm thick) 68 million pieces	Hanoi	4.05	Joint venture, technology, equipment, expertise: technical, training
3610	117	Ceramic decorative articles Vases, elephant figurines, pots: 113,000 pieces	Dong Nai	1.08	Joint venture, buyback/barter/counterpurchase, subcontracting, equipment, expertise: marketing, training

3610	118	Porcelain sanitary ware Wash-basins, lavoratories: 1,000 tons	Vinh Phu Province	3.00	Joint venture, buyback, technology, equipment, export marketing, expertise: management, technical, marketing
3610	119	Insulation porcelain 600,000 pieces	Song Be	2.09	Joint venture, technology, export marketing, expertise: technical, marketing, training
3610/ 3691	120	Tiles and sanitary ware Glazed tiles: 150,000 sq. m Lavoratories: 150,000 pieces	Thai Binh Province	7.94	Joint venture, technology, equipment, export marketing, expertise: management, technical, marketing, training
3620	121	Glass products Glasses: 60,000 pieces Lampshades: 50,000 pieces Other glass products: 20,000 pieces	Hanoi	2.31	Joint venture, technology, equipment, export marketing, expertise: technical, training
3620	122	Glass bottles (200 ml and 700 ml) 4,000 tons	Ha Nang	4.83	Joint venture, equipment, expertise: management, technical, marketing
3691	123	Clay Kaolin, light industrial clay for filling and coating, etc: 40,000 tons	Song Be	1.95	Joint venture, equipment, expertise: training
3692	124	Portland cement (P400-P500) 600,000 tons	Song Be	73.14	Joint venture, equipment, expertise: management, training
3699	125	Granite and marble blocks and stones Marble blocks: 3,000 cu m Marble stones: 120,000 sq m Granite blocks: 3,000 cu m Granite stones: 120,000 sq m	Vinh City	3.58	Joint venture, non-traditional financing, technology, equipment, export marketing, expertise: management, technical, marketing, training
3699	126	Marble processing Wash-basins: 15,840 pieces Bath-tubs: 1,056 pieces Panels: 9,504 pieces	Dong Hai	0.49	Joint venture, technology, equipment, expertise: technical, marketing
3699	127	Granite processing 104,000 m2	Lam Dong Province	3.71	Joint venture, technology, licensing, equipment, export marketing, expertise: management, technical marketing, training
3699	128	High quality graphite Graphite (88% carbon): 500 tons Graphite (92%-95% carbon): 500 tons Graphite powder (92% carbon): 600 tons	Hoang Lien Son	1.80	Joint venture, barter, technology, licensing, export marketing, expertise: technical, marketing
3699	129	Marble and granite slabs and granite blocks Marble slabs: 25,000 sq m Granite slabs: 25,000 sq m Granite blocks: 12,000 cu m	Ho Chi Minh City	5.19	Joint venture, barter/counterpurchase, equipment, export marketing, expertise: marketing, training
3699	130	Processing of asbestus fibre 3,000 tons	Hanoi	0.78	Joint venture, technology, subcontracting, equipment, expertise: technical, training
3720	131	Antimony processing 600 tons	Ha Son Binh	1.39	Joint venture, technology, subcontracting, equipment, export marketing, expertise: technical, training
3811	132	Three ball track locks 1 million units	Haiphong	1.17	Joint venture, buyback, technology, equipment, export marketing, expertise: management, technical, marketing
3813/ 3841	133	Scrap iron and steel from old ships 30,000 tons	Haiphong	5.71	Joint venture, technology, equipment, export marketing, expertise: management, technical, marketing, training
3819	134	Wire drawing and cable manufacture ACSR cables: 1,000 tons Copper cables (2.5-10 sq mm): 500 tons	Hanoi	1.66	Joint venture, technology, equipment, expertise: technical, training
3821	135	Diesel engines 4-30 KW diesel engines: 25,000 units	Hanoi	19.84	Joint venture, technology, equipment, export marketing, expertise: technical, marketing, training
3821	136	Parts for internal combustion engines Aluminium pistons, cast iron piston rings, chassis, axles, bearings, gaskets: 445,000 units	Ho Chi Minh City	6.12	Joint venture, technology, licensing, equipment, export marketing, management, technical, training

3824	137	Spare parts for and assembly of printing machines Offset presses: 35 units Paper cutters: 30 pieces Wire stitchers: 60 pieces Spare parts: 15 tons	Hanoi	2.74	Joint venture, equipment, export marketing, expertise: management, technical, marketing, training
3829	138	Assembly line for electrical appliances Refrigerators: 7,000 units Freezers: 3,000 units Air conditioners: 500 units	Hanoi	1.36	Joint venture, technology, equipment, expertise: technical, marketing, training
3829/ 3831	139	Electrical household appliances Table and ceiling fans: 40,000 units Refrigerators: 10,000 units Air conditioners: 1,000 units Motors (0.6-4.5 kW): 5,000 units	Da Nang	1.00	Joint venture, technology, subcontracting, licensing, equipment, export marketing, expertise: management, technical, marketing, training
3829/ 3832	140	Electrical household goods and appliances Televisions/radio-cassettes: 10,500 units Electric fans,motors: 75,750 units Refrigerators/air conditioners: 3,000 units	Ha Bac Ninh	2.20	Joint venture, equipment, export marketing, expertise: management, technical, marketing, training
3831	141	Petrol engines 1-10 HP petrol engines: 10,000 units	Hanoi	2.68	Joint venture, technology, equipment, expertise: technical, training
3831	142	Power capacitors (4-60 MF) 200,000 units	Hanoi	1.89	Joint venture, technology, subcontracting, equipment, export marketing, expertise: technical, training
3831/ 3833	143	Electric fans and motors and and transformers Electric fans: 100,000 units Electric motors: 3,000 units Transformers (5-15 kVA): 3,000 units	Hanoi	3.55	Joint venture, technology, equipment, expertise: technical, training
3832	144	CKD television set assembly B/W (14") and colour (14" and 21") TVs: 120,000 sets	Hanoi	4.48	Joint venture, technology, equipment, export marketing, expertise: management, technical, marketing, training
3832	145	Electrodynamic microphones 300,000 pieces	Ha Bac Ninh	1.35	Joint venture, buyback/barter, technology, subcontracting, licensing, equipment, export marketing, expertise: management, technical, marketing, training
3832	146	Assembly line for electronic equipment TV transmitters (10 W- 1 kW): 300 units Equipment and parabolic antennas for video signals from artificial satellites: 5,000 units	Hanoi	2.27	Joint venture, technology, subcontracting, equipment, expertise: technical, training
3832	147	Light emitting diodes Red LEDs: 35 million units Green and yellow LEDs: 15 million units	Hanoi	4.51	Joint venture, leasing, technology, equipment, export marketing, expertise: management, marketing, training
3832	148	Assembly of photovoltaic solar cell modules PV modules (8-43 W): 17,100 pieces	Hanoi	1.06	Joint venture, buyback, technology, equipment, expertise: management, technical, marketing, training
3832	149	Manufacture of piezoelectric products Piezoceramic discs, cylinders and other products: 10 tons	Hanoi	3.15	Joint venture, buyback, technology, equipment, export marketing, expertise: management, technical, marketing, training
3832/ 3851	150	Assembly of IID information equipment FM transceivers (5-25 W): 5,000 units SSB transceivers (20-100 W): 2,000 units Radiotelephones (1-10 km): 10,000 units	Hanoi	1.91	Joint venture, technology, subcontracting, equipment, expertise: technical, training
3832	151	CKD production line for assembly of televisions, radio-cassettes and radios Television receivers: 300,000 units Radio-cassette players: 100,000 units Radios: 100,000 units	Hanoi	22.67	Joint venture, technology, equipment, export marketing, expertise: management, technical, marketing, training
3833	152	Electrical household appliances Heaters (800 W-2 kW): 100,000 units Irons (1 kW): 100,000 units Stoves: (1-2 kW): 10,000 units	Hanoi	1.84	Joint venture, technology, subcontracting, equipment, export marketing, expertise: technical, training
3839	153	Fluorescent lamps (20 and 40 W) 4 million pieces	Ho Chi Minh City	4.90	Joint venture, technology, subcontracting, equipment, expertise: technical, training

3839	154	Dry cells and storage batteries Dry cells: 60 million pieces Lead acid storage batteries: 100,000 kVh	Dong Nai	7.91	Joint venture, technology, equipment, export marketing, expertise: management, technical, marketing, training
3839	155	Dry batteries (1.5 - 12 V) 100,000 pieces	Hanoi	1.35	Joint venture, technology, subcontracting, equipment, expertise: technical, marketing, training
3839	156	Ballast neon tubes (40 W/200 V) and high voltage ballast (80-40° W/220 V) Ballast neon tubes: 1,000,000 units High voltage ballast: 500,000 units	Hanoi	1.73	Joint venture, technology, subcontracting, equipment, export marketing, expertise: technical, training
3851	157	Blood administration sets (filter surface 10 sq cm, mesh width 200 Um, tubing length 150 cm) 2 million sets	Ho Chi Minh City	2.87	Joint venture
3851	158	Electric measuring instruments Single-phase watt hour meters: 400,000 Three-phase watt hour meters: 100,000 Current transformers: 50,000 Volt/ampere meters: 50,000	Hanoi	3.00	Joint venture, technology, equipment, expertise: technical, training
3903	159	Badminton rackets Wood and aluminium frame rackets: 1 million pieces	Thai Binh	2.82	Joint venture, non-traditional financing, technology, licensing, equipment, export marketing, expertise: management, technical, marketing, training
3909	160	Feather processing Washed feathers: 340 tons Bed feather products: 300,000 pieces	Hanoi	2.87	Joint venture, buyback/barter/counterpurchase, technology, equipment, export marketing, expertise: management, technical, marketing, training
3909	161	Stuffed toys Stuffed animals from cotton, wool, cloth and rubber: 2.5 million pieces	Haiphong	1.84	Joint venture, equipment, export marketing
5000	162	Renovation and construction of housing Renovation of 400 sq m, construction of 2 storey houses of 600 sq m area each	Hanoi	1.50	Joint venture, expertise: training in construction technology
5000/ 6320	163	Construction of a 10-storey hotel/ offices Hotel rooms: 3,191 sq m (4 floors) Office space: 5,825 sq m (6 floors)	Ho Chi Minh City	5.99	Joint venture, equipment, export marketing, expertise: management, technical, marketing, training
5000	164	Construction of a fishery harbour Capacity for handling 200,000 - 250,000 tons/year of fish	Ho Chi Minh City	12.00	Joint venture, barter, technology, equipment, expertise: management, technical, training
5000/ 6320	165	Construction of Hanoi Trade Service Centre Meeting rooms, showrooms, offices, restaurant and hotel rooms	Hanoi	8.95	Joint venture, equipment, expertise: management, training
5000/ 6320	166	Upgrading 77-room hotel to 3-star category	Lam Dong	6.50	Joint venture
5000/ 6320	167	Upgrading two hotels (110 rooms each) to 4- and 5-star category and construction of a golf course	Lam Dong	20.50	Joint venture, equipment, expertise: training
5000/ 6320	168	Construction of a cultural and tourist centre for domestic and foreign tourists	Ha Bac	3.25	Joint venture, equipment, expertise: management, technical
5000/ 6320	169	Construction of 60-room beachfront hotel	Nghe Tinh	1.07	Joint venture, equipment, expertise: management, technical, marketing, training
5000	170	Construction of trade centre/office block Trade centre: 2,680 sq m Office space: 7,927 sq m	Ho Chi Minh City	8.91	Joint venture, equipment, export marketing, expertise: management, technical, training
5000	171	Construction of apartment block and service centre (shops, swimming pool, parking, etc.) 150 apartments/125-150 sq m each Service area: 6,000 sq m	Ho Chi Minh City	15.52	Joint venture, equipment, expertise: management, technical, training)

5000	172	Expansion and modernization of a 4-storey trade centre/office block/apartments 70 offices: 7,000 sq m Trade centre: 3,000 sq m 20 apartments: 2,200 sq m	Ho Chi Minh City	14.42	Joint venture, equipment, expertise: management, technical, marketing, training
5000/ 6320	173	Expansion and upgrading of hotel to 100 rooms	Ho Chi Minh City	4.00	Joint venture, equipment, export marketing, expertise: management, technical, marketing, training
5000/ 6320	174	Construction of a 12-storey hotel/offices Hotel: 110 rooms Office space: 1,020 sq m Restaurant/shops: 1,274 sq m	Ho Chi Minh City	10.68	Joint venture, equipment, export marketing, expertise: management, technology, marketing, training
5000/ 6320	175	Tourist area construction Resort accomodation, entertainment facilities, restaurants: 165 ha construction area on 500 ha land area	Ho Chi Minh City	To be determined	Joint venture, technology, licensing, equipment, export marketing, expertise: management, technical, marketing, training
3211	176	Fabric knitting, dyeing and printing Knitted fabric: 3.1 million m	Ho Chi Minh City	7.23	Joint venture, subcontracting, expertise

Supplementary list of projects

The Government of Viet Nam is inviting foreign companies, institutions and organizations involved in industrial development to discuss the following additional projects, for which project profiles will be available at the Investment Forum for Viet Nam in Ho Chi Minh City.

ISIC No.	Project no.	Project title/ Products and annual output	Location	Total investment (US$ million)	Type of foreign co-operation sought
3530	177	Oil refinery 3 million tons	Dong Nai	200.00	Joint venture
2302/ 3720	178	Bauxite exploitation and aluminium processing 3 million tons	Lam Dong	1,000.00	Joint venture
3720	179	Aluminium smelter 150,000 tons	Quang Ninh	800.00	Joint venture
3720/ 4101	180	aluminium smelter and hydropower plant complex Aluminium: 120,000 tons Hydropower: 670 MW	Gialai Kontum	1,200.00	Joint venture
2301	181	Iron ore mining 3 million tons	Nghe Tinh	1,000.00	Joint venture
2302	182	Copper mining 350,000 tons	Hoang Lien Son	200.00	Joint venture
3512	183	Nitrogen fertiliser NH3: 1,360 tons/day	Dong Nai	300.00	Joint venture
4101	184	Thermal power plant from associated gas 600 MW	Dong Nai	300.00	Joint venture
5000	185	Highway Noi Bai-Hanoi (30 km)	Hanoi	20.00	Joint venture
5000	186	Highway Hanoi-Haiphong (100 km)	Hanoi/Haiphong	50.00	Joint venture
3843	187	Car production 150,000 cars	Da Nang	600.00	Joint venture

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