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UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

INDUSTRIAL DEVELOPMENT REVIEW SERIES

BOLIVIA

Prepared by the
Regional and Country Studies Branch
Division for Industrial Studies

Preface

Within the framework of UNIDO country surveys and studies, a series of industrial development reviews on developing countries is prepared by the Regional and Country Studies Branch of the Division for Industrial Studies.

The reviews provide a general survey and brief analysis of each country's industrial development, both as a service to those within UNIDO and other international agencies concerned with industrial policy, planning, investment promotion, project development and implementation, and as a ready source of information for Governments. It is hoped that the reviews will prove useful as well to financial and industrial enterprises, both public and private, to research institutes and to aid agencies in developed countries. The reviews also aim at providing a basis for undertaking in-depth studies of specific aspects of industrial policies, strategies and programmes in the developing countries and at providing a basis for informed discussion and analyses of industrial development trends and policies.

The reviews draw on information provided by the UNIDO data base, material available from national and international statistical publications, and other sources. While up-to-date national statistics are not always available on every aspect of industrial development, the reviews will be updated periodically and efforts are being made to improve the UNIDO data base and to monitor industrial progress and changes in industrial policy on a regular basis.

The present review was prepared towards mid-1985 on the basis of information available at UNIDO headquarters. It is divided into two rather distinct parts. Chapters 1 and 2 are analytical in character, giving first a brief overview of the country's economy and its manufacturing sector and then a more detailed review of the structure and development of its manufacturing industries. Chapters 3 and 4 contain various kinds of reference material - which it is hoped will be useful to readers - on national plans and policy statements relevant to industrial development, on the country's natural,

human and financial resources for industrial development and on the more important governmental and other institutions involved in industrial development. The Review also contains relevant basic indicators, graphical presentation of manufacturing trends as well as statistical and other appendices.

It should be noted that the reviews are not official statements of intention or policy by Governments or by UNIDO, nor do they represent an official assessment by UNIDO of industrial development in the countries concerned. Readers are invited to comment on the findings and analyses and thereby assist UNIDO in improving and updating the reviews.

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EXPLANATORY NOTES

Regional classifications, industrial 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 (1970/71) indicate a crop year or a financial year. Dates divided by a hyphen (1970-71) indicate the full period, including the beginning and end years.

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

In tables:

Three dots (...) indicate that data are not available or are not separately reported;

A dash (-) indicates that the amount is nil or negligible;

A blank indicates that the item is not applicable;

One dot (.) indicates that there is insufficient data from which to calculate the figure;

Totals may not add precisely because of rounding.

The following abbreviations are used in this document:

CBF	Bolivian Development Corporation
COFADENA	Armed Forces Industrial Holding Corporation
COMIBOL	Corporation Minera de Bolivia
ECLAC	Economic Commission for Latin American and Caribbean
ENAF	National Tin Smelting Plant
GDP	gross domestic product
GNP	gross national product
INACPRE	National Pre-investment Institute
INI	National Investment Institute
ISIC	International Standard Industrial Classification
ITC	International Tin Council
JUNAC	Junta del Acuerdo de Cartagena
LAIA	Latin American Integration Association
MTOE	Million Tons of Oil Equivalent
MVA	manufacturing value added
NSI	National Statistical Institute
ODA	Official Development Assistance
PETROBRAS	Brazilian State Oil Company
SITC	Standard International Trade Classification
YPFB	State Oil Company Yacimiento Petroliferos

BASIC INDICATORS 1
The economy

GDP: (1983)	$3,340 million at current market prices						
Population (1983):	6.08 million						
Average annual growth of population (1973-83)	2.6 per cent						
Labour force: (1985)	1.96 million						
GDP per capita: (1983)	$510						
Average annual growth rate of GDP(per cent):	1960-70	1970-76	1976-80	1981	1982	1983	1984
	5.5	5.9	2.5	-1.1	-9.1	-3.7	1.8

GDP by sector of origin: (per cent)	1963	1981
Agriculture	28.8	16.7
Services	45.6	56.1
Mining	7.6	7.4
Manufacturing	13.6	14.6
Construction	3.6	3.9
Utilities	0.9	1.2

Inflation rate (per cent per year)	1979	1980	1981	1982	1983	1984	1985
	19.7	4.7	32	123	375	1,860	Above 14,000

Currency exchange rate: (Peso equivalents to $1)	1979	1982	1984 average	March 1985
	20	200	2,174	45,000

BASIC INDICATORS 2
Resources and transport infrastructure

Resources	
Cash crops Leading products by value:	Oilseeds, cotton, tobacco, sugar-cane, coffee, tea, cacao
Livestock (total number in millions, 1982):	Cattle (5.1), sheep (9.7), goats (2.0), pigs (1.7), llama, alpaca
Fisheries total catch (average 1982):	5,300 tons
Forests	564,684 sq. km. 51.4 per cent of total area
Mining:	Tin, lead, antimony, bismuth, tungsten, copper, silver, gold
Hydrocarbons:	Oil, natural gas
Electric energy production (1979):	1,438 Giga watt-hours
of which hydroelectric	1,014 Giga watt-hours
thermal	424 Giga watt-hours
Transport	
Roads:	39,824 km. of which 3.5 per cent paved, 20.1 per cent gravel
Railways:	3,733 km.
Major Ports:	As a landlocked country, Bolivia depends on rail and river links to Atlantic and Pacific ports in neighbouring countries.
Airports: (International)	La Paz, Santa Cruz and Cohabamba

BASIC INDICATORS 3
Foreign trade and balance of payments

Exports (1984) Total value:	$730 million
Main goods:	Tin, natural gas, zinc, silver, wood and wood products, coffee, sugar, rubber, cotton
Main destinations:	USA, Argentina, German F.R., U.K. Netherlands, Switzerland, Brazil, Peru, Chile
Imports (1984) Total value:	$482 million
Main goods:	Industrial and mining inputs, capital goods, transport equipment, pharmaceuticals
Main origins:	USA, U.K., Japan, Argentina, Brazil, Peru, German F.R., Chile

Balance of Payments:				
Current account deficit (1983)	$183.6 million			
Net reserves: (October 1984)	$ 52 million			
Foreign Debt: (December 1984)	$4,868 million			
Debt Service:	1974	1979	1982	1983
As per cent of exports:	11.4	31.4	28.3	30.5
As per cent of GNP:	3.2	6.2	4.8	4.4
Total debt service (in $ millions):				
Official creditors	25.5	76.7	99.1	120.1
Private creditors	42.6	193.0	161.1	146.6

BASIC INDICATORS 4
The manufacturing sector

Manufacturing value added: (1981)				$390 million (1975 dollars)			
MVA per capita: (1981)				$68.2 (1975 dollars)			
Employment in manufacturing (1979):				147,000			
as per cent of total labour force:				8.6 per cent			
MVA per employee: (1979)				$3,667			
Annual growth rate of MVA: (per cent)	1960-70	1970-76	1976-80	1981	1982	1983	1984
	6.9	6.6	3.1	-2.5	-2.8	-1.2	5.0
Sectoral composition of MVA: (per cent)			1973		1979		
Mainly Consumer goods			72.8		67.3		
Mainly Intermediate goods			24.9		29.6		
Mainly Capital goods			2.3		3.1		
Trade in manufactures[a/] (1979):							
Total value - Exports:			$ 18.2 million				
- Imports:			$658.6 million				
Share of manufactures[a/]							
- in total exports:			2.2 per cent				
- in total imports:			78.2 per cent				

a/ SITC 5-8 less 68.

BASIC INDICATORS 5
Trade in manufactured goods

In 1979

MANUFACTURED EXPORTS[a] total value: $18.2 million

Principal manufactured exports [b]	per cent of total	Destination (in per cent)				
		Developing countries	Developed market Countries			Centrally planned developed countries
			EEC	USA	Japan	
Sugar, sugar preparations and honey	(34.7)	50.8	4.5	44.7	0.0	0.0
Wood, shaped or simply worked	(18.9)	60.4	7.2	26.2	3.2	0.0
Cotton	(11.8)	19.0	77.8	0.0	3.2	0.0
Machinery and transport equipment	(6.1)	99.6	0.4	0.0	0.0	0.0

MANUFACTURED IMPORTS[a] total value: $658.6 million

Principal manufactured imports [b]	per cent of total	Origin (in per cent)				
		Developing countries	Developed market Countries			Centrally planned developed countries
			EEC	USA	Japan	
Machinery and transport equipment	(59.0)	17.99	22.3	37.9	12.8	1.9
Chemicals	(11.1)	32.5	37.5	19.2	1.1	0.38
Iron and steel	(6.6)	38.5	13.7	10.7	32.7	1.39
Rubber manufacturers	(2.6)	34.5	4.3	19.3	37.1	1.84
Textile yarn, fabric and made-up articles	(2.4)	34.3	13.2	23.9	22.4	0.34

a/ SITC 5-8 less 68.
b/ Products with high degree of processing in SITC 0-8 less 68.

BASIC INDICATORS 6
Inter-country comparison of selected indicators

	Unit	Bolivia	Chile	Colombia	Ecuador	Peru	Venezuela
I. Demographic indicators							
Population (mid-1983)	millions	6.0	11.7	27.5	8.2	17.9	17.3
Population growth (1973-83)	per cent per annum	2.6	1.7	1.9	2.6	2.4	3.5
Infant mortality (1983)	per 1000	123	40	53	76	98	38
Area (1980)	'000 Km^2	1,099	757	1,139	284	1,285	912
Density (1983)	persons per km^2	6	16	24	29	14	19
II. Economic indicators							
GDP (1983)	$ billion	3.34	19.29	35.31	10.70	17.63	8.17
GDP growth (1973-83)	per cent per annum	1.5	2.9	3.9	5.2	1.8	2.5
GNP per capita (1983)	US $	510	1,870	1,430	1,420	1,040	3,840
Agriculture (1983)	per cent of GDP	23	10	20	14	8	7
Industry (1983)	per cent of GDP	26	36	26	40	41	40
Manufacturing (1983)	per cent of GDP	16	20	17	18	26	17
Services (1983)	per cent of GDP	52	55	51	46	51	53
Exports of goods and non-factor services (1983)	per cent of GDP	19	24	10	25	21	26
Gross domestic investment (1983)	per cent of GDP	7	8	19	17	13	12
External public debt (1983)	per cent of GNP	77.7	39.2	18.3	63.0	48.1	19.8
III. Industrial indicators							
MVA (1982)	million $ at constant 1975 prices	344	1,694	2,686	1,247	3,963	5,709
MVA share of world MVA (1981)	per cent	0.02	0.12	0.18	0.06	0.20	0.26
Share of manufactured exports in total exports (1982) a/	per cent	2.2 b/	7.39 c/	24.1	2.9	13.9	12.5
Average annual growth of MVA (1973-83)	per cent	1.7	0.5	1.9	8.9	0.4	3.7

a/ SITC 5-8 less (67 + 68).
b/ 1979.
c/ 1981.

Executive Summary

The Bolivian economy experienced a fairly impressive growth rate of around 6 per cent during 1970-76. Growth declined to 2.5 per cent during 1976-80. Negative growth rates characterized the three consecutive years 1981, 1982 and 1983 which were accompanied by deteriorating economic situation culminating in hyperinflation, two-digit unemployment rate and inreasing difficulties in obtaining external financing. As a result, the Bolivian Government suspended debt-service payments thrice since 1980. GDP is calculated to have grown by around 1.8 per cent in 1984. This mild recovery was largely due to a 12 per cent rise in agricultural output and a 5 per cent increase in manufacturing value added. The "informal" sector is growing at the expense of wage labour and now accounts for an estimated three-quarters of the economy.

The present economic difficulties are the result of both internal and external developments. The international prices of some of Bolivia's mineral exports - particularly tin - have fallen significantly in recent years. On the other hand, investments undertaken during the 1970s, mostly capital intensive, have not led to an increase in Bolivia's economic growth.

During the 1970s Bolivia pursued an import-substituting industrialization strategy. Consumer goods industries (such as food production, beverages, tobacco and wood products) grew rapidly. They employed capital-intensive technology and the proportion of imported raw materials was generally high. Moreover, industrial development was slow and levels of government protection were high. This stimulated the growth of enterprise inefficiencies - particularly within the large and rapidly growing public sector. Despite an MVA growth rate of 5.5 per cent over the decade 1970-1981, productivity has risen only marginally. Capacity under-utilization has become a serious problem - the utilization rate was estimated at about 60 per cent in 1980 and is likely to have fallen to around 45 per cent by the end of 1984. Manufacturing production remains domestic demand oriented; its contribution to total exports of processed manufactures, excluding non-ferrous metals, is limited to about 2 per cent.

Restructuring the pattern of industrial development is an important objective of the current Development Plan (1984-1987). Industries producing basic needs goods and export-oriented goods are to be encouraged. The import content of industrial production is to be reduced. An effort is to be made to increase self-financing within the industrial corporate sector. The industrial financing system is to be reorganized and easier access to credit is to be made available to small-scale enterprise within the agro-industrial branches.

The current problems of natural resource-based industries stem largely from lack of exploration. Revitalization of processing industries calls for consistant efforts to explore reserves and to improve the productive process that makes efficient use of low grade ore.

The resumption of industrial recovery depends critically upon the restoration of financial stability and further vigorous thrusts to control hyperinflation. The newly elected Government which assumed office in August 1985 seems to have determined to pronounce decisive reforms and initiate new measures towards rehabilitation of the economy, with a renewed emphasis on curtailing inflation, concluding agreements with creditors and encouraging foreign investments in mining and petroleum industries. The new Government seems to encourage renewed negotiations with the IMF to work out an arrangement for rescheduling of debt. As a bid to curb one of the world's highest inflation rates, the new Government devalued the peso by 95 per cent and froze public sector wages.

Favourable rescheduling loans have been obtained by Bolivian firms from some international creditors. Increased concessional multilateral assistance can play an important part in the revitilization of the economy. Multilateral assistance could concentrate on the provision of management development and training, exploring regional export markets for Bolivian manufacturing and on the development of small-scale enterprises within the manufacturing sector.

Resumen para ejecutivos

De 1970 a 1976 la economía boliviana registró una tasa de crecimiento del 6%, que es bastante considerable. De 1976 a 1980 el crecimiento disminuyó al 2,5%. Tres años consecutivos, 1981, 1982 y 1983, se caracterizaron por tasas de crecimiento negativas, acompañadas por el deterioro de la situación económica que culminó en la hiperinflación, una tasa de desempleo de dos cifras y mayores dificultades para obtener financiación externa. En consecuencia, desde 1980 el Gobierno suspendió en tres oportunidades los pagos por servicio de la deuda. Se calcula que en 1984 el PIB creció en aproximadamente el 1,8%. Esta leve recuperación se debió principalmente a un aumento del 12% en la producción agrícola y del 5% en el valor agregado manufacturero (VAM). Se estima que el sector no estructurado, que crece a expensas de la mano de obra asalariada, ahora representa un 75% de la economía.

Las dificultades económicas actuales son resultado de circunstancias internas y externas. Los precios internacionales de algunos de los minerales que exporta Bolivia - sobre todo el estaño - han caído considerablemente en los últimos años. Por otra parte, las inversiones hechas durante el decenio de 1970, principalmente en empresas capital intensivas, no se han traducido en un mayor crecimiento económico del país.

Durante el decenio de 1970 Bolivia siguió una estrategia de industrialización con miras de la sustitución de importaciones. Las industrias de bienes de consumo (tales como las productoras de alimentos, bebidas, tabaco y productos de madera) se desarrollaron rápidamente. Emplearon tecnología capital intensiva, y la proporción de materias primas importadas en general fue elevada. Además, el crecimiento industrial fue lento y el grado de protección oficial elevado, lo cual se tradujo en deficiencias en las empresas, sobre todo en el vasto sector público, que crecía rápidamente. A pesar de que en el período de 1970-1981 la tasa de crecimiento del VAM fue del 5,5%, la productividad sólo ha registrado un aumento marginal. La subutilización de la capacidad de producción se ha convertido en un grave problema: en 1980 se calculaba que era de un 60%, y probablemente ha caído a un 45% para fines de 1984. La producción manufacturera sigue orientada hacia la demanda interna; su contribución al total de las exportaciones de manufacturas, excluídos los metales no ferrosos, se limita a un 2%.

La reestructuración del desarrollo industrial constituye un objetivo importante del actual Plan de Desarrollo (1984-1987). Se promoverán las industrias que producen bienes para satisfacer las necesidades básicas y las de exportación. Se reducirá el contenido de importación de la producción industrial, y se procurará aumentar la autofinanciación en el sector de las empresas industriales. Se reorganizará el sistema de financiación industrial y se facilitará el crédito para las pequeñas empresas de los ramos agroindustriales.

Los problemas actuales de las industrias basadas en recursos naturales se deben principalmente a la falta de exploración. La revitalización de las industrias de proceso, requiere de esfuerzos concertados para la exploración de reservas y para mejorar los procesos de producción que hagan un mejor uso de minerales de baja ley.

La reanudación de la recuperación industrial depende en grado sumo del restablecimiento de la estabilidad económica y de un nuevo y vigoroso impulso a las medidas para controlar la hiperinflación. El Gobierno recientemente electo, que asumió el poder en agosto de 1985, parece resuelto a introducir reformas decisivas y a aplicar nuevas medidas de rehabilitación de la economía, intensificando los esfuerzos por frenar la inflación, celebrando acuerdos con los acreedores y alentando las inversiones extranjeras en las industrias minera y petrolera. Al parecer el nuevo Gobierno promueve la reanudación de las negociaciones con el FMI con miras a un acuerdo de reestructuración de la deuda. En un esfuerzo para contrarrestar una de las más altas tasas de inflación en el mundo, el nuevo Gobierno devaluó el peso en 95% y congeló los salarios del sector público.

Empresas bolivianas han obtenido de algunos acreedores internacionales condiciones favorables en la reestructuración del reembolso de los préstamos. El aumento de la asistencia multilateral en condiciones de favor puede desempeñar un papel importante en la revitalización de la economía. La asistencia multilateral podría concentrarse en el desarrollo en materia de gestión y capacitación, exploración de los mercados regionales de exportación para las manufacturas bolivianas y establecimiento de pequeñas empresas manufactureras.

1. THE BOLIVIAN ECONOMY

1.1 Recent economic trends

The Bolivian economy grew at an annual average rate of 6 per cent during 1970-76. This fairly impressive growth was not sustained since 1977. GDP registered a 4.8 per cent growth in 1977, but fell to 1.8 per cent in 1979. The recession which took hold in 1980 has been followed by three years of negative growth rates, accompanied by two-digit unemployment and five-digit inflation rates. GDP is estimated to have grown by 1.8 per cent in 1984. This mild recovery was largely the result of a 12 per cent rise in agricultural output (which was hard hit by prolonged drought during the preceding few years) and of a 5 per cent increase in manufacturing output. However, recession continues in the mining and petroleum sectors.

Hydrocarbons, ores and metals account for 95 per cent of total export earnings. A series of strikes halted production, and low commodity prices - particularly tin prices - adversely affected export earnings in recent years. Exports declined from $740 million in 1983 to $730 million in 1984. A fall in imports from $544.7 million in 1983 to $482 million in 1984 is a reflection of the scarcity of foreign exchange and low level of economic activity. Non-traditional exports, e.g., coffee, sugar, wood, rubber, leather and metal manufactures, declined from $150 million in 1980 to $50 million in 1983. According to recent estimates, there was further contraction in 1984.

Inability to earn foreign exchange has led to rising arrears in debt-service payments. Total external debt stood around $4.9 billion in 1984. In the early 1980s the military regimes then in power suspended Bolivia's debt servicing to the international private banking sector and fell behind in repaying multilateral agencies and foreign government creditors - an obligation accounting for more than 70 per cent of Bolivia's total public sector debt. In 1982 the constitutionally elected new Government dealt with its debt inheritance responsibility. The new Government's first move was to renegotiate 26 per cent of its public debt and to standardize its multilateral obligations. In 1983, it resumed the

payments in an effort to surmount the international blockade against Bolivia. Foreign exchange shortage was such that Bolivia suspended interest payments on its debt in March and principal in June 1984.

Massive increase in fiscal deficit, sharp depreciation in the value of the Bolivian peso and hyperinflation coupled with wage demands and frequent political upheaval resulted in a deteriorating economic situation for well over eight years.

The Government has sought to deal with this situation. In February 1985 the Government devalued the peso by 80 per cent in relation to the dollar. Other measures include: quarterly control of the public budget; new regulations for the payment of taxes by private business sector; and special concessions to exporters to control 30 per cent of their foreign earnings, 40 per cent in the case of non-traditional private sector exports.

A new development strategy has been formulated and is incorporated in the 1984-87 National Development Plan. The Plan emphasises the need for national control and utilization of economic surplus. The Plan accords priority to promoting key exports and to satisfying the basic needs of the population.

Subsidies on essential commodities have been reduced. Transport and food prices have been increased. Interest rates and legal reserve limits of commercial banks have also risen. However, these measures have not proved sufficient for concluding an IMF standby agreement for rescheduling of Bolivia's debt.

Though 1984 was a relatively better year for Bolivia, the economic situation remains extremely difficult. Bolivia has the potential to recover from the present economic crisis by sustaining the current revival of the agricultural sector and by obtaining foreign capital for financing modernization of key industrial projects. This process can be further facilitated by encouraging the small-scale sector and by bringing the informal sector progressively into the economy.

Since the manufacturing sector has been hampered by shortages of raw materials and capital goods, the Government approved $30 million credit in June 1984 to pay for imported industrial inputs and disbursed $182 million in August for the purchase of machinery. Bolivia has been negotiating a global credit deal to revitalize its economy. It includes a $220 million credit from the USSR for the purchase of machinery and equipment. After several years of deceleration, with chemicals, metal products and clothing as the worst hit industries, the manufacturing sector showed signs of recovery in 1984.

In early August 1985 the new President-elect announced an Economic Reforms package which would aim at combating hyper-inflation, reducing the budget deficit, relaxing controls on prices, and devaluing the currency. An agreement would be sought with the IMF and thereafter with the Foreign Commercial Banks to whom Bolivia owes $3.3-5.0 billion of debt which it has not serviced for more than two years. There are indications that the Government would welcome foreign capital for new investments in mining and petroleum projects and would decentralize the large state-owned mining corporation COMIBOL. In late August 1985 the new Government devalued the peso by 95 per cent and froze public sector wages in an effort to curb one of the highest inflation rates in the world, exceeding 14,000 per cent.

1.2 Economic structure

Bolivia had a per capita GDP of $510 in 1983 and was classified by the World Bank as a middle-income developing country. Bolivia's per capita GDP is 38 per cent of the average for Latin American countries. Per capita MVA in Bolivia is about 20 per cent of the Latin American average.

Table 1 shows that the 1960s and 1970s saw significant structural change within the economy. The GDP share of the service sector grew from 45.6 per cent in 1963 to 56.1 per cent in 1981. Agriculture declined in relative terms with its share falling from 28.8 per cent to 16.7 per cent over the same period. During the latter half of the 1970s mining has also declined. It accounted for 15.2 per cent of GDP in 1973. By 1981 its

share had fallen to 7.4 per cent. Manufacturing increased its GDP share marginally from 13.6 per cent in 1963 to 14.6 per cent in 1981. The current economic crisis has seriously affected the manufacturing sector, and a contraction in manufacturing output occurred during 1981-1983.

Table 1. Distribution of GDP by sector of origin, 1963-1981
(at current prices)

Year	Agri-culture	Mining & quarrying	Manufact-uring	Utilities	Construct-tion	Services	GDP
	(P e r c e n t a g e)						($ million)
1963	28.8	7.6	13.6	0.9	3.6	45.6	497.2
1964	26.7	9.3	14.1	0.9	3.3	45.7	559.0
1965	26.1	9.5	14.5	0.9	4.9	44.2	620.4
1966	24.8	9.5	15.1	1.1	3.6	46.0	686.9
1967	22.1	10.5	14.8	1.2	3.7	47.7	776.6
1968	21.1	9.6	14.5	1.3	4.3	49.1	880.4
1969	21.3	9.2	14.9	1.3	4.0	49.3	957.7
1970	18.1	10.3	14.5	1.3	4.1	51.7	1,041.6
1971	18.5	8.4	14.5	1.3	4.2	53.0	1,139.2
1972	18.0	12.5	14.0	1.3	3.8	50.4	1,301.1
1973	18.1	15.2	13.9	1.2	4.3	47.4	1,307.5
1974	18.9	17.3	13.1	0.8	3.8	46.1	2,191.4
1975	18.2	11.2	13.3	0.9	4.4	51.9	2,473.4
1976	17.4	11.0	13.5	1.0	4.7	52.4	2,889.3
1977	16.9	10.8	13.6	1.0	5.2	52.5	3,337.1
1978	17.2	11.3	13.8	1.1	4.4	52.3	3,823.7
1979	16.3	11.7	13.4	1.0	4.2	53.5	4,529.1
1980	16.6	9.9	14.1	1.0	4.1	54.4	5,507.5
1981	16.7	7.4	14.6	1.2	3.9	56.1	7,225.9

Source: Statistics and Survey Unit, UNIDO. Based on data supplied by the Office of Development Research and Policy Analysis and the UN Statistical Office, with estimates by the UNIDO Secretariat.

Fifty per cent of the labour force in Bolivia is in agriculture which accounts for 17 per cent of GDP. Manufacturing accounted for 13.4 per cent of GDP in 1981, but grew more rapidly than both agriculture and mining over the period 1970-1981. It recorded a real annual average growth rate of 6.5 per cent, as against 2.7 per cent for agriculture and 0.9 per cent for mining.

Services, construction and the utilities sectors grew more rapidly than manufacturing during 1970-1981. The "informal" sector is growing at the expense of wage labour. About three quarters of the Bolivian economy is now estimated to be "informal", and the proportion is growing fast.

Bolivian economy faces severe internal and external difficulties. Since the middle of the 1970s the budget deficit has tended to grow rapidly. In 1982, the budget deficit was equivalent to 82 per cent of budgeted expenditure and 28 per cent of GDP - one of the highest levels in Latin America. On the other hand, Government revenue as a proportion of GDP has been falling rapidly - from 11.7 per cent in 1977 to 4.8 per cent in 1982. The growing budget deficit has fuelled inflation. Money supply increased from 10,304 million pesos in 1979 to 111,399 million pesos by October 1983. The consumer prices index (1980 = 100) rose from 67.9 in 1979 to 1109.4 in 1983 and to over 2000 per cent in 1984. The inflation rate is estimated at over 14,000 per cent during 1985.

The external situation is also serious. Exports (valued in $ terms) fell for the fourth consecutive year in 1983 and were then below the level attained in 1970. Imports were reduced from $768.7 million in 1979 to $44.7 million in 1982 - a fall of almost 30 per cent. However, a large net outflow on the service account - service payments increased by 14 per cent during 1980-1982 - ensures the existence of a substantial current account deficit - up from $93.3 million in 1982 to $183.6 million in 1983. There has also been a rapid growth in external debt - from $618 million in 1978 to over $4,868 million in 1984. In 1984, the debt service to export ratio reached 30.5 per cent. In May 1984 Bolivia announced a suspension of interest payments on its external debt. Attempts to achieve a standby agreement with the IMF to facilitate a restructuring of Bolivia's debt have not so far been successful.

The internal and external difficulties faced by the Bolivian economy reflect both a rapidly depleting natural resource base and an inadequate policy response to economic opportunities. Bolivia is a landlocked and sparsely populated country (population 6.0 million, density 6 persons per sq. km., 1983), with small internal market, weak linkages among the major economic sectors and low levels of infrastructural investment. During the early 1970s

growth prospects seemed bright. Bolivia entertained expectations of becoming a major oil exporter. Commodity prices were rising and foreign credit was readily available. This optimism led to a rapid growth in public and private consumption - symbolised by the expansion of the public sector - investment in costly projects and the emergence of a large trade imbalance stimulated by the over-valuation of the Bolivian currency.

By the late 1970s it was clear that the optimism had been misplaced. Oil wells were quickly exhausted leaving significant excess capacity in the refining industry. The quality of mineral production deteriorated due to a neglect of essential modernization and upgrading investment. Low producer prices and the unavailability of essential inputs restricted the growth of agriculture. Finally, many manufacturing sectors - agro-industries, mineral products and oil refining - generated substantial excess capacity due to a growing import dependence and an increasing unavailability of foreign exchange. The 1970s also saw adverse trends in regional export markets, as both Argentina and Brazil started to develop domestic capacity for the production of natural gas. These two countries have been the most important customers of Bolivia's natural gas.

1.3 An overview of the manufacturing sector

The manufacturing sector has been seriously affected by the present economic crisis. Over the period 1981-1983 manufacturing output fell by 26 per cent. Manufacturing employment - estimated at 10 per cent of the total labour force in the late 1970s - has also fallen. Initial reports suggest that there has been recovery during 1985.

Production by the manufacturing sector is primarilly oriented towards the domestic market which is small and static. The manufacturing sector is largely composed of non-durable consumer goods such as food, beverages, tobacco, as well as textiles which account for 60 per cent while handicrafts, intermediate goods and petroleum refining account for the remaining proportion of MVA. Intermediate goods industries - particularly chemicals and metal products - have been severely affected by the crisis. Linkages with the mining sector are weak. Small firms are characterized by low productivity and

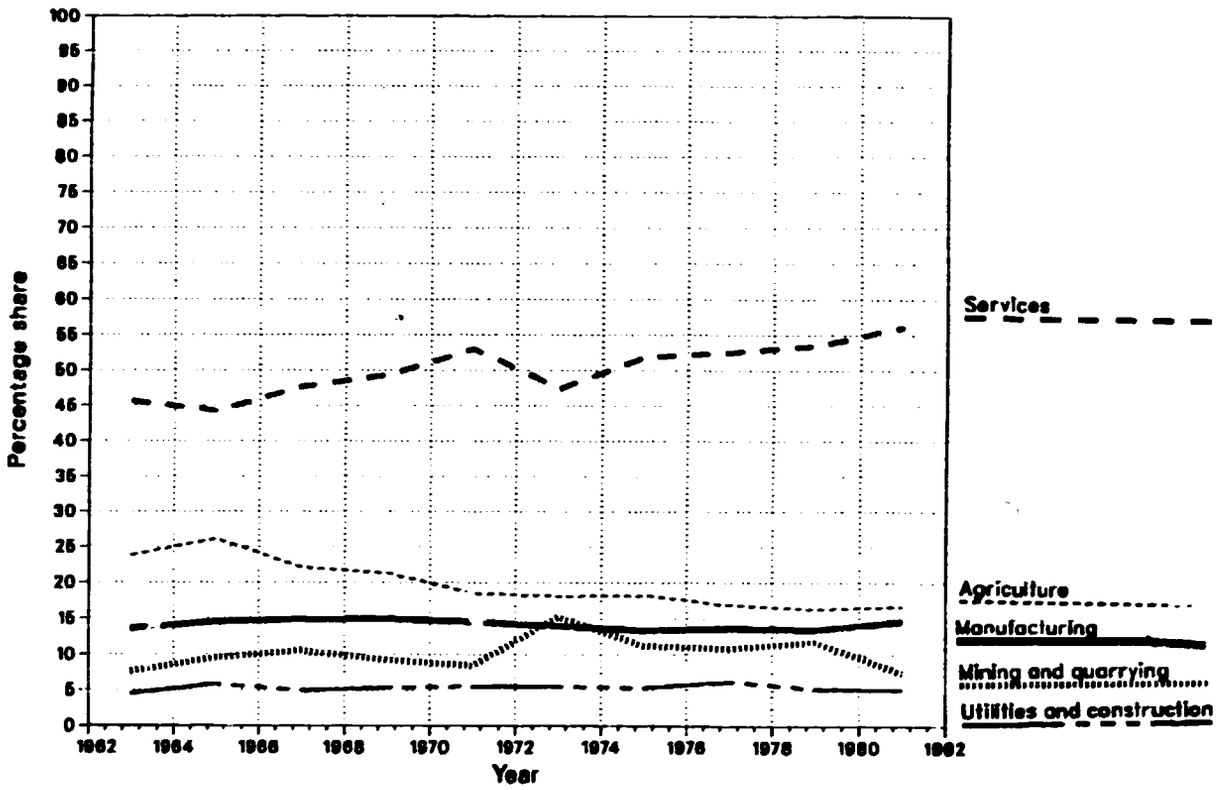
the larger ones are heavily dependent on imported inputs. The present foreign exchange shortages have led to the serious problems of underutilization of capacity in a wide range of Bolivian manufacturing branches. Capacity underutilization also reflects shortages of supply of energy, transport facilities and skilled labour. A typical example is the Bolivian oil seed industry. It has a productive capacity of 44,000 tonnes, but produces only 22,000 tonnes.

In the 1970s the Andean Group industrialization schemes initiated steps towards the development of the Bolivian manufacturing sector. However, the sectoral programmes of the Andean Group were not implemented and Bolivia was not able to take advantage of non-reciprocal concessions in trade liberation and project allocations made available by the Andean Pact countries to Bolivia.

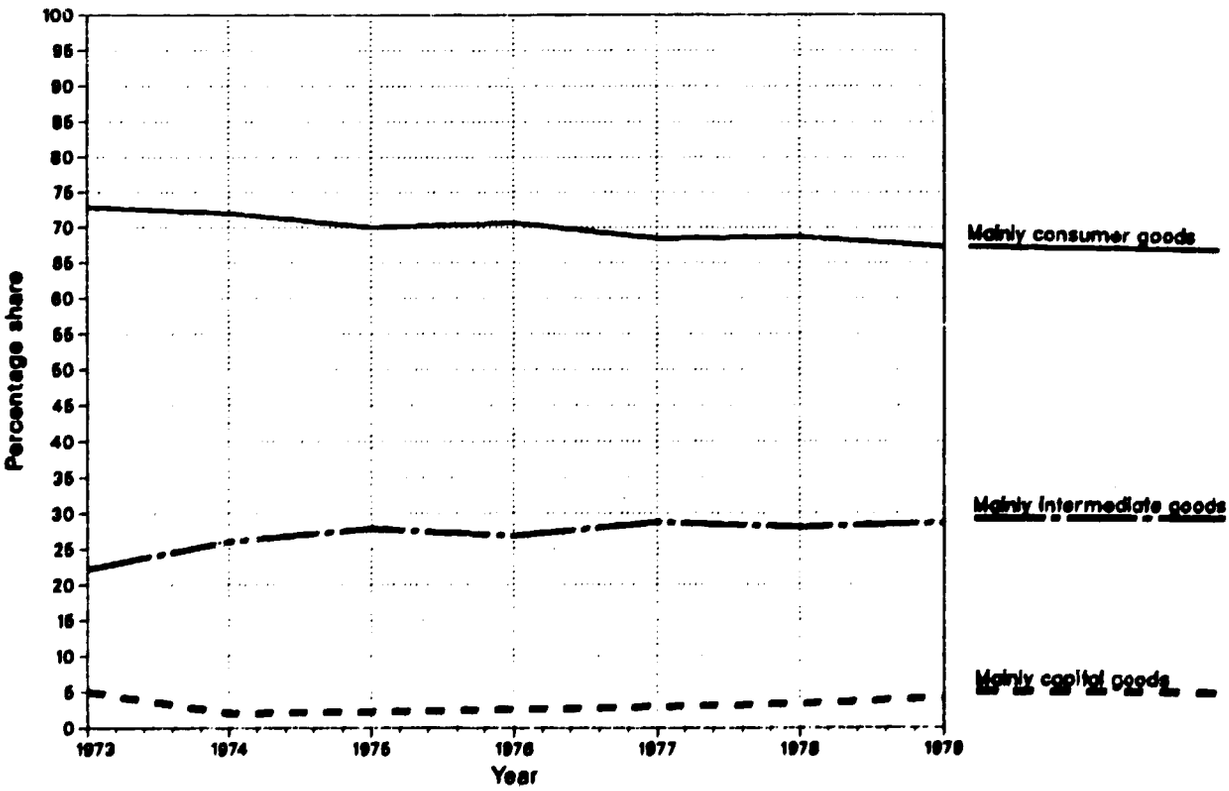
The manufacturing sector is 'dualistic' in structure. There is a small number of large-scale industries heavily dependent on imported raw material and technology, on the one hand, and numerous small enterprises employing traditional production technologies on the other. Productivity in the latter group of enterprises is very low. The State participates in many of the large manufacturing enterprises through the Bolivian Development Corporation (CBF) and the Armed Forces Industries (COFADENA). The State also owns the national tin smelting plant (ENAF). The share of the public sector in manufacturing investment rose from 15 per cent in 1970 to 40 per cent in 1979. CBF invested $30 million annually during this period. Many public enterprises suffer from management problems and other operational inefficiencies. The 1984-1987 National Plan emphasises the need to improve industrial efficiency, promote the growth of export-oriented manufacturing branches and branches (such as agro-industries) which produce 'basic needs' commodities for the mass of the population. The Plan recognises the need for restructuring and revitalization of the Bolivian manufacturing sector.

MANUFACTURING TRENDS

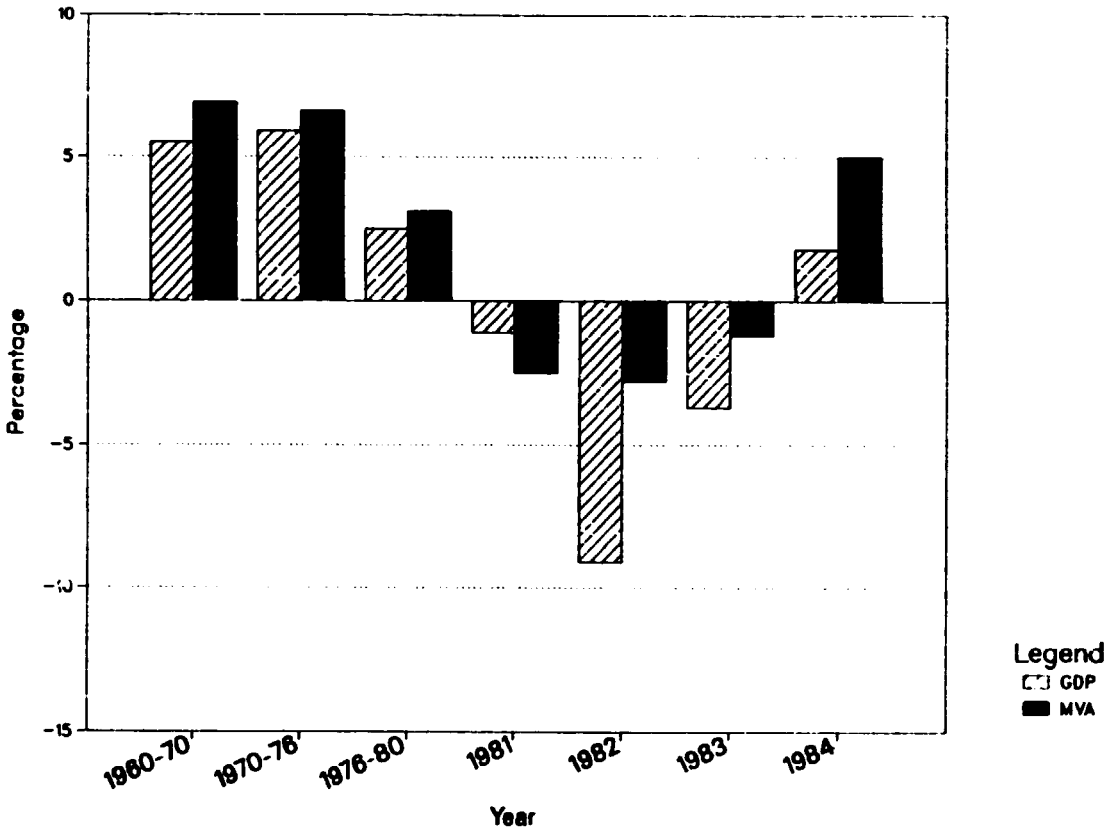
GDP BY ECONOMIC SECTOR, 1963-1981



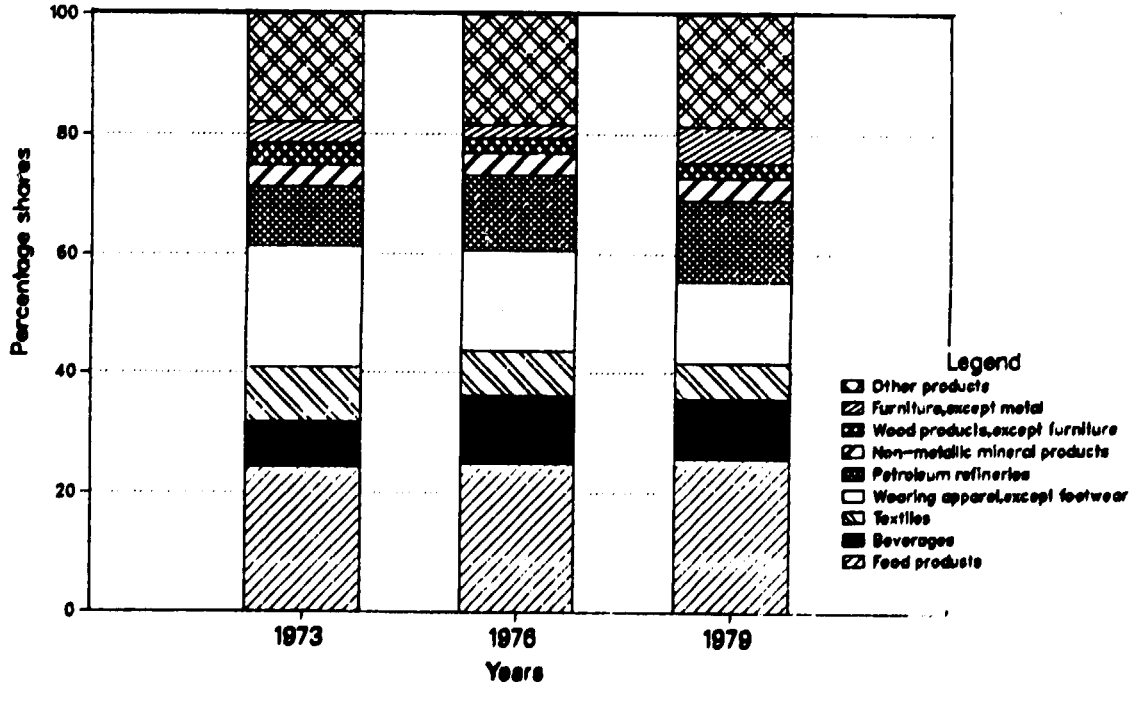
MANUFACTURING VALUE ADDED BY END USE, 1973-1979



ANNUAL RATES OF GROWTH OF GDP AND MVA, 1960-1984

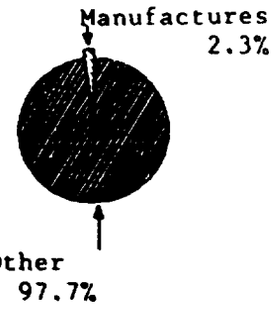


COMPOSITION OF MVA BY MAIN BRANCHES, 1973,1976 AND 1979

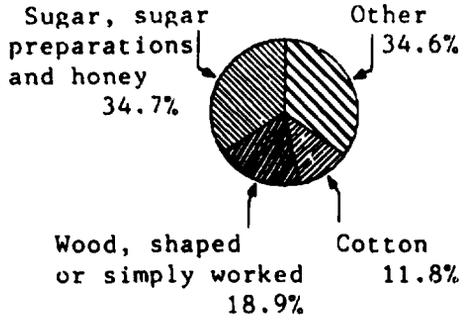


EXPORTS AND IMPORTS IN 1979

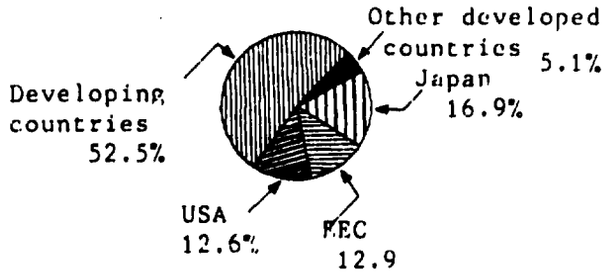
SHARE OF MANUFACTURES IN TOTAL EXPORTS



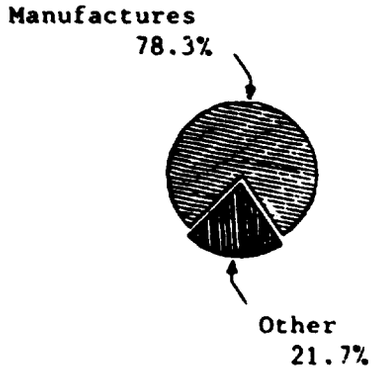
COMPOSITION OF MANUFACTURED EXPORTS



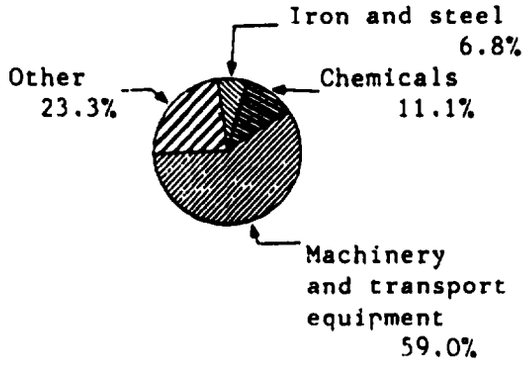
DESTINATION OF MANUFACTURED EXPORTS



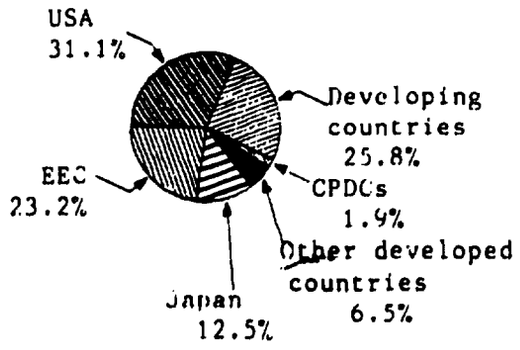
SHARE OF MANUFACTURES IN TOTAL IMPORTS



COMPOSITION OF MANUFACTURED IMPORTS



ORIGIN OF MANUFACTURED IMPORTS



2. STRUCTURE AND PERFORMANCE OF THE MANUFACTURING SECTOR

2.1 Growth and structural change

MVA grew at a real rate of 6.6 per cent over the period 1970-1976. This exceeded the rate of both agriculture and mining and was second only to the growth experienced by the hydrocarbon sector. During 1977-1981, MVA growth dropped to 1.5 per cent. Growth during the early 1980s has been negative. Manufacturing output of 1984 is about 30 per cent lower than the level achieved in the late 1970s. However, most other sectors experienced a greater decline in the early years of the present crisis than manufacuturing (Appendix Table A-2).

A breakdown of the interbranch comparison of growth rates (based on UNIDO data) within the manufacturing sector for the period 1973-1981 is provided in Table A-3. Beverages, non-ferrous metals, metal working industries, iron and steel and non-metallic furniture had above average growth rates during this period. Textiles, clothing, leather products and other manufactured products experienced negative growth. High growth rates for the basic metals, metal products and petrochemical sectors during the 1970s are also indicated by data provided by national and international sources such as JUNAC and the World Bank. This reflects investments in tin smelting and in capital goods construction. The growth of the petrochemical industry was due to investments aiming at a rapid expansion of the country's refining capacity at a time when international petroleum prices were expected to remain relatively high. The growth that occurred was concentrated in a relatively larger number of new industries.

Table 2 reveals that during 1970-81 there had been significant structural change within the manufacturing sector. The share of chemicals, plastics and petroleum derivatives in total MVA increased from 19.21 per cent in 1970 to 35.13 per cent in 1981. Food, beverages and tobacco continued to dominate the manufacturing sector; their share of MVA increased from 33.01 per cent in 1970 to 37.03 per cent in 1981. Textile and leather products seem to have been severely hit by input constraints and depressed demand; their relative importance in total MVA declined from 34.41 per cent in 1970 to 8.63 per cent

in 1981. Basic metals tend to emerge as an important sector through its increasing contribution to MVA from 0.11 per cent in 1970 to 6.18 per cent in 1981.

Table 2. Composition of MVA, [a/] 1970-1981
(percentage share)

	1970	1975	1978	1981
Food, beverages and tobacco	33.01	34.56	36.06	37.03
Textiles and leather	34.41	23.86	19.25	8.63
Wood and wood products	3.01	3.42	2.27	2.27
Paper products and printing	1.22	1.73	1.60	2.29
Chemicals, plastics and petroleum derivatives	19.21	23.34	26.49	35.13
Non-metallic minerals	4.80	6.35	6.06	4.05
Basic metals	0.11	1.56	2.91	6.18
Metal products	1.23	2.25	3.04	1.84
Other	2.90	2.89	2.27	2.58
Total [b/]	100.00	100.00	100.00	100.00

Sources: World Bank, Bolivia: Structural Constraints and Development Prospects, Report No. 4194-130, January 1983; UN, Industrial Statistics Yearbook, 1982, Vol. I.

a/ Including metallurgy.
b/ Total does not add up to 100 because of rounding.

The deceleration in growth rates experienced during the latter part of the 1970s has persisted during the current economic crisis. Most of the large capital and import-intensive plants are located within those industries which have been particularly severely affected by foreign exchange shortages. Problems of under-utilization of capacity have also become serious, not only due to a shortage of imported inputs but also because of falling domestic and export demand. The existence of this excess capacity necessitates a reorganization of industrial investment and the adoption of policies which stimulate the growth of enterprise efficiency within the manufacturing sector.

2.2 Performance of the manufacturing sector

Estimates of employment in manufacturing sector vary widely. According to the 1976 Population Census, manufacturing employment stood at about 145,000 in 1976. According to the Ministry of Labour, manufacturing employment in Bolivia increased from 108,000 in 1970 to 147,000 in 1979. According to national statistics, employment in formal manufacturing was around 43,349 in 1979. The International Labour Organization reports 155,500 persons as paid employees engaged in all two-digit ISIC manufacturing enterprises in 1982. Discrepencies between data sources are largely explained by differences in establishment coverage. Table 3 presents the structure of manufacturing employment between 1974 and 1982. What is striking is a sharp increase in manufacturing employment from 48,400 in 1974 to 115,000 in 1976. Total manufacturing employment fell to 96,920 in 1979, but increased to 168,500 in 1981 and contracted in 1982. During the period of rapid growth in the first half of the 1970s manufacturing employment grew rapidly and the impact of the slow-down in economic activity which started after 1976 fell severely on manufacturing employment. Food, beverages and tobacco increased their contribution to manufacturing employment from 18.3 per cent in 1974 to 40.07 per cent in 1982. Employment in textiles, wearing apparel and leather industries showed signs of contraction after 1979 when their share in total employment stood at 28.3 per cent. The share of fabricated metal products, machinery and equipment is tending to increase.

Employment estimates[1/] show that the intermediate branches - such as metal products, non-ferrous metals - had the highest rate of employment growth: the share of the intermediate and capital goods branches (ISIC 34 to ISIC 38) in total manufacturing employment is seen to increase from 22.5 per cent in 1973 to 36.3 per cent in 1981. The share of these branches in MVA grew from 31.2 per cent in 1973 to almost 40 per cent in 1979. There is thus some evidence of higher levels of productivity in the intermediate and capital

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1/ Estimates reported in Appendix Table A-4 are unlikely to cover more than a third of total manufacturing employment.

Table 3. Structure of manufacturing employment, 1974-82
(percentage share)

ISIC	Manufacturing sub-sector	1974	1976	1979	1981	1982
31	Food, beverages, and tobacco	18.3	15.3	29.6	40.06	40.07
32	Textile, wearing apparel and leather industries	17.3	14.4	28.3	23.36	23.35
33	Wood and wood products, including furniture	3.1	5.5	11.1	10.4	10.4
34	Paper, paper products, printing and publishing	2.4	2.4	4.9	4.2	4.3
35	Chemical, petroleum, coal, rubber and plastic products	0.9	3.8	7.6	5.9	5.9
36	Non-metallic mineral products	3.2	2.8	5.6	4.2	4.6
37	basic metal industries	1.3	0.9	2.6	1.8	1.8
38	Fabricated metal products, machinery and equipment	3.2	4.4	8.9	7.9	7.9
	Total[a/] (in thousands)	48.4	115.0	96.92	168.5	155.5

Source: ILO, Yearbook of Labour Statistics, Geneva, 1984.

a/ Including other industries.

goods branches. If the sample contains a disproportionally large share of intermediate and metal products producers (since they are likely to be large and 'formal' enterprises), it over-estimates the share of the intermediate branches in total manufacturing employment. Estimates of their share in MVA are taken from the Ministry of Labour data (reported by the World Bank) which cover the whole of the manufacturing sector - not just the formal part.

If it is accepted that the share of the intermediate branches in total manufacturing employment is significantly lower than that shown in the UNIDO estimates then there are grounds for believing that intermediate branches have a much higher relative level of productivity than that indicated by a direct

comparison of World Bank and UNIDO estimates. Such assertions are likely to remain speculative, however, as long as the nature of the basis in Bolivian industrial statistics gathering procedures is not explicitly taken into account. Doubt is cast on the validity of such assumptions when analysing figures on the inter-branch distribution of real productivity growth provided by UNIDO for the period 1973-1981 and reproduced in Table 4. These estimates show that only nine branches (out of a total of 28) experienced positive productivity growth during this period. Six of these nine could be classified as intermediate or capital goods branches. But some of the intermediate and capital goods branches - such as petroleum refineries, iron and steel, non-ferrous metals, transport equipment and plastic products - had exceptionally high negative productivity growth rates.

UNIDO also provides data on the inter-branch dispersion of the value added to output and the wages to value added ratios for the period 1973-1981. Table 5 shows that the share of value added to total output has increased marginally. This contradicts findings by Bolivian sources that the value added to gross output ratio declined during the 1970s[1/]. Both estimates, however, confirm that the share of wages in value added fell substantially during this period. There is thus some ground for arguing that while raw material and equipment costs may have risen, labour declined substantially and the amount of gross surplus generated within the sector probably increased. On the basis of the UNIDO figures largest gains in the value added ratio were enjoyed by tobacco, wood products, other chemicals, rubber products, plastic products and the electrical machinery branches. There is a positive correlation between growth in value added and decline in the wage share of value added. It is the capital-intensive production branches which have tended to increase their rate of surplus mobilization. However, the relationship between the two variables is a weak one. It is more surprising to find a negative (though not significantly different from zero) correlation between productivity growth and growth in the value added ratio. There is some evidence for the view that falling wage rates stimulated an excessive

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1/ Junta del Acuerdo de Cartegena; Politicas industrial de Bolivia Durante la decade de los anos (JUN/di 607.1).

Table 4. Indicators of industrial growth, by branch of manufacturing, 1973-1981

BOLIVIA

Description (ISIC)	Growth of value added at 1975 prices		Growth of employment		Growth of value added per employee	
	1973-1981		1973-1981		1973-1981	
TOTAL MANUFACTURING(300)	-0.84		7.96		-8.15	
Food products(311)	6.06		6.67		-0.57	
Beverages(313)	13.64	a/	4.73		8.42	a/
Tobacco(314)	-1.63		-4.06		2.53	
Textiles(321)	-1.52	b/	0.44		-2.92	b/
Wearing apparel,except footwear(322)	-1.52	b/	-0.54		-1.05	b/
Leather products(323)	-2.43	a/	10.78		-14.13	a/
Footwear,except rubber or plastic(324)	5.32	a/	-7.59		6.85	a/
Wood products,except furniture(331)	-1.60		13.40		-13.23	
Furniture,except metal(332)	14.27		10.54		3.37	
Paper and products(341)	5.25	b/	5.12		4.16	b/
Printing and publishing(342)	5.25	b/	7.32		-2.84	b/
Industrial chemicals(351)	9.41	b/	3.06		5.58	b/
Other chemicals(352)	2.76	a/	6.94		-5.13	a/
Petroleum refineries(353)	7.81		80.14		-40.15	
Misc. petroleum and coal products(354)	7.10	a/	-28.04		-9.13	c/
Rubber products(355)	9.41	b/	12.49		-4.92	b/
Plastic products(356)	7.10	a/	13.49		-11.51	a/
Pottery,china,earthenware(361)	6.63		14.17		-6.71	
Glass and products(362)	6.63		14.09		-6.54	
Other non-metallic mineral prod.(369)	4.90		12.15		-6.47	
Iron and steel(371)	9.02		38.35		-21.20	
Non-ferrous metals(372)	16.08		42.01		-18.26	
Fabricated metal products(381)	16.59	b/	14.52		-0.06	b/
Machinery,except electrical(382)	16.59	b/	9.30		6.10	b/
Machinery electric(383)	16.59	b/	5.28		9.29	b/
Transport equipment(384)	16.59	b/	32.10		-14.47	b/
Professional & scientific equipm.(385)	16.59	b/	13.17		1.39	b/
Other manufactured products(390)	-6.36	b/	19.23		-26.03	b/

Source: Statistics and Survey Unit, UNIDO.Based on data supplied by the UN Statistical Office, with estimates by the UNIDO Secretariat.

Note: TOTAL MANUFACTURING is the sum of the reported ISICs and does not necessarily correspond to ISIC 300 total.

Footnotes: a/ 1973-1979.
b/ 1973-1980.
c/ 1976-1978.

Table 5. Selected industrial indicators, by branch of manufacturing, 1973 and 1981
(at current prices)

BOLIVIA (currency=Peso)

Description (ISIC)	Value added per employee		Wages and salaries per employee		Share of value added in gross output (percentage)		Share of wages and salaries in value added (percentage)	
	1973	1981	1973	1981	1973	1981	1973	1981
TOTAL MANUFACTURING(300)	55617	467884	18913	68896	37.0	38.3	34.0	14.7
Food products(311)	66595	509631	19524	82911	25.8	30.2	29.3	16.3
Beverages(313)	124067	584577	27099	75981	65.0	55.3	21.8	13.0
Tobacco(314)	330357	2677778	21429	83333	47.1	72.2	6.5	3.1
Textiles(321)	32630	134572	18384	54014	40.6	41.1	56.3	40.1
Wearing apparel,except footwear(322)	28653	132179	11843	54239	34.9	41.2	41.3	41.0
Leather products(323)	34946	156627	15054	55723	29.5	37.4	43.1	35.6
Footwear,except rubber or plastic(324)	57803	106383	19268	52805	49.5	50.5	33.3	49.6
Wood products,except furniture(331)	25385	127226	11514	47546	21.9	35.0	45.4	37.4
Furniture,except metal(332)	11673	68441	9339	41255	33.3	36.4	80.0	60.3
Paper and products(341)	15625	91603	4688	38168	25.0	21.8	30.0	41.7
Printing and publishing(342)	45880	218371	21161	67360	36.8	39.2	46.1	30.8
Industrial chemicals(351)	64103	272436	20513	78846	48.4	56.7	32.0	28.9
Other chemicals(352)	44406	311502	20239	84878	28.6	41.9	45.6	27.2
Petroleum refineries(353)	...	7321379	...	170207	...	57.2	...	2.3
Misc. petroleum and coal products(354)	...	71429	...	35714	...	50.0	...	50.0
Rubber products(355)	33333	159292	13333	71239	33.3	18.5	40.0	44.7
Plastic products(356)	56150	266046	25134	76708	38.2	50.5	44.8	28.8
Pottery,china,earthenware(361)	26316	169643	10526	67857	50.0	54.3	40.0	40.0
Glass and products(362)	34682	134383	23410	87651	54.5	34.2	67.5	65.2
Other non-metallic mineral prod.(369)	52097	348508	17535	59737	53.9	51.9	33.7	17.1
Iron and steel(371)	25641	205714	15385	52571	50.0	37.1	60.0	25.6
Non-ferrous metals(372)	19231	463115	11538	63479	25.0	13.4	60.0	13.7
Fabricated metal products(381)	35330	166578	11521	43481	20.7	26.2	32.6	26.1
Machinery,except electrical(382)	40609	412946	30457	98884	72.7	58.9	75.0	23.9
Machinery electric(383)	31250	324910	16667	65704	27.3	44.6	53.3	20.2
Transport equipment(384)	...	295987	5128	70903	...	44.4	...	24.0
Professional & scientific equipm.(385)	31746	142857	19048	66387	50.0	50.0	60.0	46.5
Other manufactured products(390)	26316	182602	7895	45513	66.7	48.7	30.0	24.9

Source: Statistics and Survey Unit, UNIDO.Based on data supplied by the UN Statistical Office, with estimates by the UNIDO Secretariat.

Note: TOTAL MANUFACTURING is the sum of the reported ISICs and does not necessarily correspond to ISIC 300 total.

growth of manufacturing employment thereby depressing productivity growth in most branches. This is supported by Table 3 which shows that negative rates of productivity growth were recorded in 19 of the 28 industrial branches for which data is available.

Relatively low levels of industrial efficiency are the consequence of the creation of excess capacity during the 1970s. While employment and capital expenditure have risen, production has remained stagnant due to insufficient demand and inadequate infrastructural support. Excess capacity problems exist in a wide range of manufacturing branches. Industrial policy and project selection procedures have tended to favour the growth of capital and import-intensive industries which are domestic market oriented and which rely increasingly on Government support. Operational inefficiencies have become institutionalized particularly within the public industrial sector. Improving industrial efficiency is an essential pre-requisite for reducing imports and increasing manufactured exports particularly to neighbouring countries.

2.3 Exports and imports of manufactures

Bolivia is essentially an exporter of mineral products. The share of minerals in total exports, however, fell from 89.5 per cent in 1970 to 61.9 per cent in 1980. The export of hydrocarbons - both oil and natural gas increased from 5.7 per cent to 23.6 per cent over the same period. Manufactured products (SITC 5-8 less 68) accounted for 2.2 per cent of total merchandise exports in 1979. However, Bolivia also exports a wide range of processed mineral and hydrocarbon products. The National Statistical Institute (NSI) incorporates these in its classification of manufacturing - it reports export figures according to ISIC classification. Exports originating in ISIC 3 accounted for 27.9 per cent of total exports, according to NSI in 1983, despite the fact that in dollar terms their value had fallen by as much as 45 per cent in comparison to 1980. Employing an even wider classficatory scheme incorporating 148 SITC items, UNIDO estimates that manufacturing exports represented about 40 per cent of exports in 1979 - down from 45 per cent in 1970. ECLAC estimates non-metallic manufactured exports as 4.8 per cent of the total in 1979 - significantly higher than the 2.2 per cent

estimate of SITC 5 to 8 (less 68) exports provided by UNIDO and the 2.07 per cent share estimated on the basis of the Brussels Customs classificaton.

Thus if the wider classification is employed manufactured exports can be seen to account for currently 30 per cent of total exports, with the share of processed metals in manufactured exports ranging from 70 to 80 per cent. Processed mineral exports increased from $24.7 millon in 1972 to $265.7 million in 1980. Their share in total mineral exports increased from 14.2 per cent to 41.4 per cent over this period. Among non-mineral manufactures wood products and processed foods account for about 40 per cent of total export revenue. Other important export items are supplied by the textile and metal products branches.

Using a more narrow definition, the share of the manufactures (SITC 5-8 less 68) in total exports has fallen from about 3 per cent to 2.2 per cent over the period 1970-1979. As mentioned earlier, the share of oil manufactured exports in total Bolivian exports has also fallen over this period. On the other hand, the share of manufactured imports (SITC 5-8 less 68) has reached about 78 per cent in 1979. Manufactured imports thus grew more rapidly than manufactured exports during the 1970s. Since the beginning of the present crisis import growth has slowed down. Total imports fell in 1982 and although they rose again in 1983, in both years there was a surplus on the balance of trade. Lower import levels, however, depressed import dependent industrial production. It is essential, therefore, to stimulate the growth of exports - particularly manufactured exports which are less susceptible to widely fluctuating international prices. This requires an offsetting of the import-substitution bias apparently inherent in Bolivian industrial policies.

2.4 Ownership and investment patterns

Gross industrial capital formation increased at an annual average rate of 6.9 per cent during 1970-1979. This was higher than the corresponding growth rate of both value added and employment. The incremental capital-output ratio for the period has been estimated at 2.38. Investment within manufacturing was concentrated in food-processing (37 per cent of the total), textiles

(25 per cent) and chemical and petrochemical industries (1[illegible] per cent). Bank credit supplied to manufacturing units grew faster than inv[illegible]ment. State participation in industrial investment increased from 15 per cent to 40 per cent during 1970 to 1979. The metallurgy, iron and steel and petrochemical sectors were reserved exclusively for State investment.

The three major public industrial investors were the Bolivian Development Corporation (CBF) which owns 27 enterprises, the national Tin Smelting Plant (ENAF) and the Armed Forces Industrial Holding Corporation (COFADENA). COMIBOL operates repair and maintenance shops for mining equipment.

In the early 1980s CBF enterprises accounted for 82 per cent of sugar refining, 38 per cent of alcohol production, 100 per cent of milk processing, 32 per cent of acetates, 73 per cent of cement, and 100 per cent of rubber and ceramic production. The 1984-1987 Plan anticipates more investment by CBF and COFADENA in the cement, ceramics, food processing and metal working branches.

Private sector investment remains concentrated in small-scale industry and artisan workshops. In recent years domestic private investment has shown a declining tendency. Medium sized private firms were established in the food processing and wool industries - the latter is export-oriented. During 1970-1980 direct foreign investment in Bolivia amounted to $130 million, representing 1.3 per cent of gross capital formation. Estimates of foreign investment in the manufacturing sector are not separately available. A significant proportion of foreign investment is concentrated in the metal working branches.

Investment policy has tended to favour capital and import-intensive projects. The level of protection accorded to such projects has been high. Evidence of operational inefficiencies of public firms - particularly those with the CBF group - exists in a number of sources. There has in general been little association between the growth of investment and the growth of production and value added within the manufacturing sector. The textile branch which had a consistently high share in industrial investment throughout the 1970s experienced a decline in its share of MVA from 13.5 per cent in 1973 to about 3.8 per cent in 1981. Investment inefficiencies and managerial

defficiencies are also reflected in the high level of capacity under-utilization. Even before the present crisis the capacity utilization rate in Bolivian manufacturing was no higher than 62 per cent. There is thus an important need to restructure industrial investment in Bolivia.

The current problems of natural resource-based industries stem largely from lack of exploration. Ore reserves were not being identified at the same rate at which public investment was pumped into the processing industries. Inadequate exploration has also exacerbated the problem of declining ore grades. In any meaningful restructuring process of the Bolivian economy, public investments need to be concentrated on (a) consistant efforts on exploration that promises reserves to support manufacturing activity; (b) new productive process that makes efficient use of low grade ore; and (c) projects with low capital-output ratios and low import requirements.

2.5 Size and geographical distribution

An important aspect of this restructuring could be the encouragement of a better size and regional distribution of manufacturing enterprises. At present there is a highly dualistic structure. Establishments with less than 50 workers represented 92 per cent of total manufacturing establishment but accounted for just 28 per cent of total production in the middle of the 1970s. An increased trend in firm size is indicated by Industrial Survey data which shows an increase in employment of 85 per cent and an increase in number of establishments of 38 per cent over the period 1971-1981. Industries with the highest level of concentration in 1981 were non-ferrous metals, oil refineries, tobacco, pottery and china, and beverages.[1/]

There is also a high level of regional concentration as Table 6 shows. The central region of La Paz, Cochabamba, Oruro and Santa Cruz accounted for between 90 per cent and 95 per cent of industrial sales, value added and paid-in capital in 1981.

1/ These data should be cautiously interpreted because survey coverage varies from year to year.

Table 6. Geographical distribution of industry, 1981
(Percentage)

Region	Sales	Value added	Paid-in capital
Chuquisaca	3.4	5.8	2.0
La Paz	24.8	28.2	77.2
Cochabamba	24.1	28.8	7.6
Oruro	20.9	10.0	2.5
Potosi	0.5	0.4	0.1
Tarija	3.6	5.0	1.3
Santa Cruz	21.3	21.2	8.8
Beni	1.2	0.6	0.2
Bolivia	100	100	100

Distribution of industrial establishments by branch of manufacturing was as follows:

(a) La Paz: tobacco, 100 per cent of national total; textiles, clothing leather and footwear, 74 per cent; paper and cardboard, 73 per cent; chemical industries, 70 per cent; metal products, 60 per cent; basic metals and steel 60 per cent; most other industries except rubber products and wood and furniture, over 50 per cent.

(b) Cochabamba: rubber products, 69 per cent of total number of national plants; oil derivatives, 66 per cent; clay, glass and non-metal products, 29 per cent; and metal products, 27 per cent.

(c) Oruro: basic metal and steel industries, 20 per cent of plants.

(d) Santa Cruz: wood products and furniture, 40 per cent of total number of national plants; oil and derivatives, 34 per cent clay, glass and non-metal products, 29 per cent; transport equipment, 27 per cent; and cotton yarn, 100 per cent.

2.6 Recent developments in the manufacturing sector

Structural changes in manufacturing value added has been modest despite substantial investment in some intermediate branches during the 1970s. This investment has created excess production capacity and has led to the development of an import and capital-intensive production structure which is basically domestic demand oriented. Apart from the large smelters, the contribution of non-mineral-based manufactures in total Bolivian exports has been negligible. The rapid growth of public manufacturing investment has accompanied a growth in enterprise dependence on government support and increased industrial concentration. The industrial incentives system has tended to accentuate these trends.

During the early 1980s public sector investments in manufacturing had to be reduced due to shortfalls in domestic revenue and foreign exchange availability. However, plans have been announced to develop projects for the processing of mineral products. In 1984, proposals for establishing a coal run steel mill with a capacity of 70,000 tons of steel and 60,000 tons in laminated non-flat products were being considered by the Government. The State Oil Company announced plans for the establishment of a fertilizer plant at St. Cruz. Soviet aid was provided during 1984 for establishing a tractor assembly plant with a capacity of 1,000 units a year. In general, the industrial priorities of the 1984-1987 Development Plan are broadly similar to the policies pursued during the 1970s. The Plan does, however, emphasise the need for rapidly developing export-oriented industries. Industrial objectives and strategies are discussed in the next Chapter.

3. INDUSTRIAL DEVELOPMENT STRATEGIES, POLICIES, PLANS AND INSTITUTIONS

3.1 Goals of industrial policy

Bolivia's 1984-1987 Development Plan reflects two sets of considerations: the priorities and possibilities of the longer term, and the constraints and bottlenecks of the short and medium term. The underlying assumption in the Plan is that the "mining-exports" development model incorporated possibilities that are exhausted and that the time has arrived for a development strategy centered around the needs of the Bolivian people. The Plan should mark the turning point between both models. The Plan thus places particular emphasis on the following objectives:

a) National control of economic surplus. The relevant mechanisms would be the foreign trade system, the exchange control system and the planning process.

b) High priority is accorded to the "essential sector" of the economy; the "essential sector" consists of the mass consumption sectors and the export sectors (traditional and non-traditional). Certain services, inputs and capital goods, related are assimilated within the "essential sector". The essential sector includes metallurgy, agro-industrial production of both inputs and final products, and other key industries.

c) High priority is also accorded to agriculture.

d) Redistribution of income and people's participation in development.

e) Discontinuation of industrial import substitution geared to high income and consumption groups.

f) Increase of value added and diversification of exports as well as reduction of reliance on non-renewable resource exports.

g) Increase in efficiency of ENAF (smelting) and COMIBOL (large-scale mining).

State sector industrial investment will be comparatively low during the plan period although industrial and export Promotion Funds will be

established. Sectors receiving the largest public investment will be hydrocarbons, agriculture and mining, as well as agro-industries.

Industrial investment to be undertaken by the public sector from 1984 to 1987 is expected to be $41.6 million, i.e., just 2 per cent of total public investment. On the other hand, agriculture including agro-industry will receive $358.4 million.

The public sector is to make available $15.6 million to the industrial private sector through an Industrial Promotion Fund and a Fund for Non-Traditional Exports. The State's direct investment would be mainly in the cement industry (CBF) and in iron and steel (COFADENA). External credit is expected to provide 62.6 per cent of the total of $41.6 million earmarked for industry.

Industry is planned to become comparatively less import intensive. Agriculture and agro-industries together are key priority sectors of the Plan, both as the foundation of the new industrial policy oriented to the satisfaction of the basic needs of the majority of the population, and as having the same role with respect to the new export policy. The agro-industrial policy is specified on a product-by-product basis for major products. The Plan aims at reducing capacity underutilization in the wheat milling, oil milling, edible oil and sugar processing industries and at rationalising the incentive system. Operational problems such as roads, transportation and lack of inputs are identified as the main bottlenecks on expanding production in these sectors. The Plan aims at improving production in all products and branches mentioned, as well as in the industrial-processing of potatoes, cassava, fish, rubber and chestnuts, by means of diversification, partial substitution on inputs, increase in industrial efficiency, and marketing improvements.

3.2 Institutional framework for industry

The Ministry of Planning and Co-ordination is responsible for the formulation of the national development strategy. The Ministry of Industry is the primary state agency responsible for the execution of industrial policy.

The Integration Secretariat is responsible for the Andean Group and the Latin American Integration Association (LAIA). The award of incentives under the investment law are the responsibilities of the National Investment Institute (INI) and the National Pre-investment Institute (INALPRE). The industrial financing system is supervised by the Central Bank. INI was created in accordance with the provision of the Industrial Promotion Law enacted in 1981. It is the principal organ for the implementation of the industrial incentive system. Some financial benefits are provided directly by the State. These usually take the form of subsidized domestic credit, access to foreign exchange and equity participation by government industrial holdings CBF and COFADENA. Incentives are generally granted to industries with a relatively high ratio of domestic to total inputs - but many exceptions are allowed particularly in the case of engineering product manufacturers. The industrial project selection procedures are loosely integrated within the national planning system. Public industrial projects are sometimes selected and incentives granted without a clear appreciation of the probable macroeconomic implementation of these projects.[1/]

There has been an official awareness of some of the weaknesses of the industrial institutional infrastructure and corrective steps have been taken during 1984. In April 1984 a regulatory body, the Junta Monetaria, was established to control foreign currency and manage the exchange rate. Another committee was formed to administer the allocation of foreign exchange for the purchase of essential industrial inputs. Conditions determining the establishment of foreign partnerships and the procurement of foreign loans by Bolivian public and private enterprise have also been revised. Finally, measures have been announced for strengthening the National Council for Scientific and Technological Affairs which is supervised by the Science and Technology Division of the Ministry of Planning. Although some progress has been made, the institutional infrastructure is as yet incapable of fully utilising the national resource potential for accelerating the rate of industrial development.

1/ For details, see World Bank Report, Bolivia: Structural Constraints and Development Prospects, No. 4794-BO, 1983, pp. 17-19; and UNIDO, Bolivia: Small-scale Industry Survey, Report No. 4, November 1978.

4. RESOURCES FOR INDUSTRIAL DEVELOPMENT

4.1 Human resources

The Bolivian labour force has been estimated as 1.96 million in 1985, of which 1.06 million persons (54.1 per cent) are residents in urban areas. The labour force has been growing at a rate of 1.7 per cent per annum during the 1970s. Some estimates of human resources for industrial development in the late 1970s are provided in Appendix Table A-11.

The literacy rate is slightly over 60 per cent but access to secondary and technical education is limited. Facilities have been provided for adult education in technical fields. In 1978, 2,000 engineering students and 800 higher level technicians were involved in such programmes. Formal technical education is provided in universities, polytechnics and industrial and technological schools. FOMO Servicio Nacional de Formacion damano de obra is the official labour training institute which operates under the Ministry of Labour. FOMO provides training, adult education, specialisation courses and assistance to firms for increasing productivity. FOMOs' branches are located in La Paz, Santa Cruz, Tarija, Cochabamba and Beni Provinces. The 1984-1987 Plan provides for a further extension of technical training facilities. Emphasis is laid on eradicating illiteracy and extending the capability of local communities to offer technical training programmes. An effort will also be made to expand the job training schemes and to link educational and work environment.

4.2 Agricultural resources

Agriculture has in recent years declined relatively to other activities. The share in GDP has fallen from 26 per cent in 1960 to 16 per cent in 1983. The sector, however, still employs about half the population and is making an improved contribution to exports.

There are several agricultural sub-systems in the country: small farming for subsistence and/or supply to the cities; commercial agriculture integrated with agro-industry; cattle raising, and forestry. The highland regions

produce mainly for subsistence while the intermediate valleys supply food to the urban population; the plains, location of commercial agriculture, are the main origin of exports which have grown from a 4 per cent participation in total exports in 1970 to 11 per cent in 1980. Each of the sub-systems has different features in terms of size of production unit, capital intensity, productivity, use of fertilizers and irrigation. Commercial agriculture is of course the subsector showing more modern, market-oriented and capital-using features. An important contribution to Bolivia's economy has been made by its cocaine industry, which is estimated to earn about $1 billion a year.

Food staples are roots and tubers, legumes and cereals; cash crops are oilseeds, cotton, tobacco, sugar cane, coffee, tea, cacao and coca leaves. Supplies of wheat and oilseeds for local processing are not sufficient, and imports are required.

Table 7 presents production volume of principal Bolivian crops. 1983 was an unfavourable year with extensive flooding in the Altiplano and draught in the Eastern Province. In 1984 agricultural production increased by about 12 per cent with major gains in the production of rice, maize, wheat and potatoes. Bolivia is currently an exporter of rice (90,000 tons in 1984) but imports 30 per cent of other grain requirements, mainly from Argentina.

Table 7. Production of principal crops, 1982-1983

	1983 '000 tons	Per cent increase, 1982-1983
Wheat	40.3	8.2
Maize	365.6	8.3
Rice	61.7	1.2
Barley	28.0	-54.3
Potatoes	316.5	4.6
Beans	13.5	70.0
Soya	51.8	-33.9
Sugar cane	197.4	-50.0
Cotton	2.0	-50.0

Source: Llyods Bank Review, Bolivia, 1985, p. 8.

Whereas crop lands cover only 5 per cent of Bolivia's total land area, pasture lands cover 25 per cent. During 1971-1981 livestock increased substantially. The production of beef went up by 67 per cent, pork by 100 per cent and mutton by 35 per cent over this period.

Bolivia possesses ample forest resources. Natural forests cover 565,000 Km^2 or 51.5 per cent of the country's area. Roundwood removals were 4,691,000 cubic meters in 1981, of which 4,368,000 cubic meters were fuel wood and the remainder mainly sawlogs, veneer logs, and logs. Exports were 80 per cent sawn wood, and the remainder sliced veneer and other semi-processed products. Argentina (55 per cent) and the U.S.A. (30 per cent) were the major export outlets, while Japan and Venezuela bought products with higher value added. Illegal trade (of fine woods to Brazil) is believed to be as large at least as legal trade.

Both forestry and fishing resources are plentiful in Bolivia and there exists considerable scope for a significant increase in the rate of exploitation. The 1984-1987 Plan accords the highest priority to the development of the agricultural sector. A better integration between the agricultural and the industrial sector is to be achieved and a rapid expansion of agricultural and agro-industrial exports is also envisaged. The Plan forecasts a growth rate of 7.5 per cent per annum for the agricultural sector during 1984-1987.

4.3 Mineral resources

The mineral sector accounts for about 6.5 per cent of GDP and provides employment for 4.5 per cent of the total labour force. It provides 25 per cent of government revenue and 40 per cent of export receipts. Bolivia is the world's third largest producer of tin, and a major producer of antimony, tungsten and bismuth. Tin reserves stand at 1.6 million tonnes. As Table 8 shows, the production of most minerals declined during 1979-1983 - although in 1983 mining output grew by 2 per cent after a decline of 1.2 per cent in 1982. Tin production and exports have fallen significantly in recent years due to collapsing of international prices and higher extraction costs than those of its competitors. Bolivia left the London-based International Tin

Council (ITC). The ITC regulates the market through intervention in buying and selling, and export control on six producer members. According to recent estimates, Bolivia's tin production would not exceed 12,000 tons during 1985.

Table 8. Production and exports of key minerals, 1979-1983

	Production			Exports		
	tonnes	Percentage increase per annum		$ million	Percentage increase Per annum	
	1983	1983	1979-1983	1983	1983	1979-1983
Tin	25278	-5.6	-3.9	208	-25.3	-11.1
Silver	187	+10	-0.9	58	+57.1	+11.5
Wolfram	3087	-3.4	n.a	20	-40.8	-12.7
Zinc	47133	+3.2	-4.5	33	-13.0	+1.2
Antimony	9951	-28.8	-4.7	16	-8.4	-0.4

Source: Lloyds Bank Review: Bolivia, 1985, p. 10.

The 1983-1987 Plan indicates that investment worth $750 million is necessary for mineral development: $187.4 million are to be provided from domestic resources and the rest is to be obtained in the form of foreign loan and investment. Expansion of lithium, gold, silver, potasium and bismuth is envisaged.

Accelerating the pace of mineral exploitation is likely to prove expensive. The major mineral reserves are located at high altitudes and contain relatively low grade ores which involve high processing costs. The mineral sector needs foreign exchange for essential inputs. Export earning prospects remain uncertain due to falling international prices and the development of substitutes for tin and antimony.

Mineral exploration, upgrading of ores and modernisation investment within the mining sector has been low over the past decade. Larger mines have usually obtained reserves by the take over of smaller units, rather than by developing new ventures. Investment has been constrained by lack of fiscal incentives and enterprise operational inefficiency. Difficulties associated

with a rapid acceleration in mineral development have induced planners to abandon what the 1983-1987 Plan describes as a "mineral exports-based development model". Nevertheless, a revitalisation of the sector is considered essential and the Plan emphasises the need for increased prospecting and improving the allocation resource pattern within the mineral sector.

4.4 Energy resources

As Table 9 shows, Bolivia exports both crude oil and natural gas. Oil exports have, however, declined rapidly since the late 1970s. In 1983 gas was the largest foreign exchange earner for Bolivia - according to one estimate it accounted for 51 per cent of total export revenue.[1/] Estimated proven reserves of oil and gas were 180 million barrels and 188 cubic meters in 1983. Most oil reserves are in Tarija and Santa Cruz and the state oil company Yacimientos Petroliferos Fiscalis Bolivianos (YPFB) controls 60 per cent of crude production. Foreign companies - Occidental, Tessoro and Shell - are also involved in the exploration and production of both oil and gas. YPFB owns the country's refineries which have a total capacity of 74,000 b/d - substantially more than present domestic production levels. YPFB has outlined an emergency plan for the oil sector.

The main customers for Bolivian gas exports are Argentina and Brazil. Exports to Argentina have fallen due to payment difficulties and the construction of a gas pipe line to Sao Paulo has been indefinately postponed. $32 million are supposed to be spent during 1984-1987 for exploration, improving productivity, the establishment of a fertilizer plant and the construction of a gas pipe line to Brazil. However, gas exports have increased during the early 1980s (up to 20 per cent in 1984) and new agreements have been signed with PETROBRAS, the Brazilian State Oil Company.

1/ Lloyds Bank Review: Bolivia, 1985, p. 12.

Table 9. Production, consumption and export of oil and gas, 1979-1983

	1979	1980	1981	1982	1983	Per cent p.a. 1979-1983
Crude petroleum ('000 b/d)						
Production	27.9	23.9	22.2	24.4	22.2	-7.3
Consumption	19.9	23.8	23.8	26.6	23.1	2.0
Net Exports	3.4	1.8	-0.6	0.4	3.3	-15.0
Natural gas (m cu m)						
Production	4,457	4,530	4,780	5,320	5,043	2.5
Exports	1,726	2,040	2,196	2,297	2,227	7.1

Source: Lloyd's Bank Review: Bolivia, 1985, p. 11.

Electricity provides 10 per cent of domestic commercial energy requirements. At the end of 1982 installed generating capacity was 517 MW. Five hydroelectric systems produced 70 per cent of total electricity output in 1970. Output growth has been sluggish, 1.5 per cent in 1982 and minus 1.3 per cent in 1983, due to falling demand.

Table 10 provides details pertaining to commercial energy consumption. Hydrocarbons supply 86 per cent of total commercial energy consumption, while electricity accounts for just 10 per cent. In 1981 the Bolivian industrial sector consumed 21.7 per cent of different forms of commercial energy. As indicated in the Table, gas and electricity accounted for 31.6 per cent of total commercial energy consumed by the industrial sector, while fuel oil constituted 62.4 per cent of total liquid hydro-carbons in the pattern of industrial energy use.

Oil reserves are rapidly depleting and there are no new discoveries. Production has declined since 1973 and exports have been interrupted. Recently built refineries have very high excess capacity with respect to availability of crude.

Table 10. Commercial energy consumption, 1981
(MTOE)

Sectors	Liquified petroleum gas	Gaso-line	Kerosene Jet Fuel	Diesel	Fuel Oil	Total Liquid Hydro-carbons (sub-total)	Gas	Elec-tricity	Total
Industry	8	-	28	34	116	186	54	32	272
Mining	-	-	2	17	9	28	-	37	65
Transport	4	389	99	165	3	660	-	-	660
Residential/ Commercial	140	-	62	-	-	202	-	55	257
Total	152	389	191	216	128	1076	54	124	1254
Percentage shares:	14	36	18	20	12	86 100	4	10	100

Source: World Bank, Bolivia, Issues and Options in the Energy Sector, April 1983.

The 1984-1987 Development Plan is conerned to increase the exploitation of energy reserves and to economise on energy use. It emphasises the need for price reform for attaining the latter objective. Funds for accelerated exploration and modernisation of equipment are also provided. The Plan projects a rate of 2.8 per cent per annum for the energy sector during the years 1984-1987. Export prospects of gas are beginning to look difficult due to substantial gas discoveries in both Brazil and Argentina.

4.5 Financial resources

Over the period 1960-1975, the investment to GDP ratio was about 17 per cent. In the early 1980s this ratio has been reduced to about 8 per cent. National savings have shrunk to 2.8 per cent of GDP. The current Development Plan expects to increase the investment ratio to 17 per cent and the saving ratio to 8.5 per cent by 1987. The Plan expects to finance 47 per cent of total investment from national savings during 1984-1987. The Government has

allocated $41.6 million for industrial investment. Direct state investment will be in the region of $26 million, while $15.6 million will be provided to the private sector. Two Funds - one for industrial promotion, the other for export development - have been established to channel state assistance to the private industrial sector. The Government aims at reforming the industrial financing system which is said to have concentrated funds in the hands of a small number of industrial firms that have often used it for speculative and consumption purposes. The Plan intends to increase the availability of credit to smaller business units.

A major proportion (62.6 per cent) of total industrial investment during 1984-1987 is expected to be obtained from foreign sources. An effort is to be made to increase the domestic component of industrial investment by increasing enterprise efficiency and stimulating an increase in the self financing ratio within the corporate sector.

A key pre-requisite for the reorganisation of the industrial financial system is the restoration of national financial discipline. When inflation exists at three- or four-digit levels no coherent financial policy vis-à-vis the industrial sector can be adopted. The inflation process began in 1979 and the inflation rate reached over 2,000 per cent by the end of 1984. Inflation is fuelled by excessive money supply. Major macroeconomic policy initiatives are needed for restoring business confidence and restructuring industrial investment in Bolivia.

4.6 Technical assistance to industry

In 1983, Bolivia received $166 million from multilateral, bilateral and other donor organizations for development projects and activities of an economic, social and humanitarian nature. Official Development Assistance (ODA) as percentage of GNP declined from 3.7 per cent in 1977/78 to 2.4 per cent in 1982/83, and Bolivia's share in total ODA fell marginally from 0.7 per cent to 0.6 per cent during the same period. In 1982, the Bolivian industrial sector received only 4.6 per cent of total development assistance committed for Bolivia by various agencies.

Technical assistance provided by UNIDO totalled $143,194 in 1984. Appendix B presents a list of the approved and/or operational technical co-operation projects of UNIDO. These projects vary from upgrading technology in selected industrial branches to advisory missions to the Ministry of Industry. International agencies could provide support in three key areas:

1) They can collaborate in the development of a wide range of industrial manpower training programme. This is necessary for upgrading management capability, improving enterprise performance and reducing financial wastage particularly within the public sector.

2) They can provide assistance for assessing export potential in resource-based manufactured products. This can be of particular importance in achieving an integration of trade structures within the Latin American region.

3) Finally, the current Development Plan has placed emphasis on the rapid development of small-scale industry. This subsector can play a key role in reducing import dependence of heavy industries, increasing linkages with agriculture and providing employment opportunities in manufacturing. International agencies can make a useful contribution by providing technical expertise which assists in creating a suitable national institutional infrastructure for giving effective support to small-scale manufacturing enterprises in Bolivia.

Effective utilisation of external aid and financial resources obtained on a concessional basis requires macroeconomic intervention to combat high inflation rate and restore economic confidence.

Appendix A

Statistical Tables

Table A-1. International comparisons of economic performance, 1963, 1970 and 1981 (at 1975 prices)

BOLIVIA

Measure	Year of period	Country	Latin America	Developing countries Total
GDP per capita (US $)	1963	345	802	324
	1970	435	1005	409
	1981	509	1341	533
MVA per capita (US $)	1963	40	172	48
	1970	56	241	68
	1981	68	332	101
Total exports/capita (US $)	1963	65	155	76
	1970	93	182	109
	1981	92	186	124
Total imports/capita (US $)	1963	89	108	54
	1970	110	147	73
	1981	87	221	142
Total exports/GDP (per cent)	1963	18.77	19.26	23.52
	1970	21.48	18.07	26.59
	1981	18.04	13.89	23.30
Total imports/GDP (per cent)	1963	25.75	13.43	16.61
	1970	25.40	14.59	17.80
	1981	17.09	16.47	26.68
Gross capital formation	1963	59	144	53
	1970	81	214	78
	1981	60	326	137
Growth of GDP per capita (%)	1963-1970	3.65	3.03	3.13
	1970-1981	1.85	2.75	2.67
Growth of MVA per capita (%)	1963-1970	4.75	4.58	4.71
	1970-1981	2.87	3.17	3.96

Source: Statistics and Survey Unit, UNIDO. Based on data supplied by the UN Statistical Office, with estimates by the UNIDO Secretariat.

Table A-2. Real growth rates of GDP and selected sectors, 1970-81 (percentage annual changes in 1970 prices)

	Average annual growth rate 1970-76	1977	1978	1979	1980	1981	Average 1977-81
GDP at Market Prices	5.9	3.4	3.1	2.0	0.8	-0.6	1.7
Agriculture	4.9	-3.4	2.7	2.0	1.7	2.1	1.0
Mining & Metallurgy	3.2	2.9	-4.0	-6.0	1.8	...	...
(Mining)	(2.5)	(2.4)	(-5.2)	(-7.5)	(2.0)	0.1	(-1.6)
(Metallurgy)	(75.8) 1/	(13.6)	(19.4)	(11.3)	(12.4)	...	...
Hydrocarbons	17.7	-24.0	-6.7	-10.0	-6.5	-7.9	-11.0
Manufacturing	6.7	6.0	4.2	2.6	-2.4	-2.8	1.5
Other sectors	6.2	5.7	4.1	3.2	1.2	...	...

Source: World Bank, Bolivia: Structural Constraints and Development Prospects, Report no. 4194-BO (1983).

1/ In 1971 metallurgical production was close to zero, and grew after the first plants started to operate in 1972.

Table A-3. Gross output and value added in manufacturing, 1973 and 1981
(at current prices)

BOLIVIA (currency=Peso)

Description (ISIC)	Gross output (thousands)		Gross output Share in total (percentage)		Value added (thousands)		Value added Share in total (percentage)	
	1973	1981	1973	1981	1973	1981	1973	1981
TOTAL MANUFACTURING(300)	3282000	44390000	100.0	100.0	1213000	17016000	100.0	100.0
Food products(311)	1194000	12267000	36.4	27.6	308000	3704000	25.4	21.8
Beverages(313)	409000	3826000	12.5	8.6	266000	2115000	21.9	12.4
Tobacco(314)	157000	668000	4.8	1.5	74000	482000	6.1	2.8
Textiles(321)	404000	1588000	12.3	3.6	164000	652000	13.5	3.8
Wearing apparel,except footwear(322)	86000	352000	2.6	0.8	30000	145000	2.5	0.9
Leather products(323)	44000	278000	1.3	0.6	13000	104000	1.1	0.6
Footwear,except rubber or plastic(324)	182000	109000	5.5	0.2	90000	55000	7.4	0.3
Wood products,except furniture(331)	128000	999000	3.9	2.3	28000	350000	2.3	2.1
Furniture,except metal(332)	9000	99000	0.3	0.2	3000	36000	0.2	0.2
Paper and products(341)	4000	55000	0.1	0.1	1000	12000	0.1	0.1
Printing and publishing(342)	133000	965000	4.1	2.2	49000	378000	4.0	2.2
Industrial chemicals(351)	31000	150000	0.9	0.3	15000	85000	1.2	0.5
Other chemicals(352)	182000	1396000	5.5	3.1	52000	585000	4.3	3.4
Petroleum refineries(353)	0	9280000	0.0	20.9	0	5308000	0.0	31.2
Misc. petroleum and coal products(354)	0	2000	0.0	0.0	0	1000	0.0	0.0
Rubber products(355)	6000	195000	0.2	0.4	2000	36000	0.2	0.2
Plastic products(356)	55000	509000	1.7	1.1	21000	257000	1.7	1.5
Pottery,china,earthenware(361)	2000	35000	0.1	0.1	1000	19000	0.1	0.1
Glass and products(362)	22000	325000	0.7	0.7	12000	111000	1.0	0.7
Other non-metallic mineral prod.(369)	76000	1328000	2.3	3.0	41000	689000	3.4	4.0
Iron and steel(371)	2000	97000	0.1	0.2	1000	36000	0.1	0.2
Non-ferrous metals(372)	4000	7607000	0.1	17.1	1000	1017000	0.1	6.0
Fabricated metal products(381)	111000	1194000	3.4	2.7	23000	313000	1.9	1.8
Machinery,except electrical(382)	11000	314000	0.3	0.7	8000	185000	0.7	1.1
Machinery electric(383)	22000	202000	0.7	0.5	6000	90000	0.5	0.5
Transport equipment(384)	1000	399000	0.0	0.9	0	177000	0.0	1.0
Professional & scientific equipm.(385)	4000	34000	0.1	0.1	2000	17000	0.2	0.1
Other manufactured products(390)	3000	117000	0.1	0.3	2000	57000	0.2	0.3

Source: Statistics and Survey Unit, UNIDO. Based on data supplied by the UN Statistical Office, with estimates by the UNIDO Secretariat.

Table A-4. Employment, wages and salaries in manufacturing, 1973 and 1981
(at current prices)

BOLIVIA (currency=Peso)

Description (ISIC)	Employment				Wages and salaries (thousands)			
			Share in total (percentage)				Share in total (percentage)	
	1973	1981	1973	1981	1973	1981	1973	1981
TOTAL MANUFACTURING(300)	21810	36368	100.0	100.0	412500	2505600	100.0	100.0
Food products(311)	4625	7268	21.2	20.0	90300	602600	21.9	24.1
Beverages(313)	2144	3618	9.8	9.9	58100	274900	14.1	11.0
Tobacco(314)	224	180	1.0	0.5	4800	15000	1.2	0.6
Textiles(321)	5026	4845	23.0	13.3	92400	261700	22.4	10.4
Wearing apparel,except footwear(322)	1047	1097	4.8	3.0	12400	59500	3.0	2.4
Leather products(323)	372	664	1.7	1.8	5600	37000	1.4	1.5
Footwear,except rubber or plastic(324)	1557	517	7.1	1.4	30000	27300	7.3	1.1
Wood products,except furniture(331)	1103	2751	5.1	7.6	12700	130800	3.1	5.2
Furniture,except metal(332)	257	526	1.2	1.4	2400	21700	0.6	0.9
Paper and products(341)	64	131	0.3	0.4	300	5000	0.1	0.2
Printing and publishing(342)	1068	1731	4.9	4.8	22600	116600	5.5	4.7
Industrial chemicals(351)	234	312	1.1	0.9	4800	24600	1.2	1.0
Other chemicals(352)	1171	1878	5.4	5.2	23700	159400	5.7	6.4
Petroleum refineries(353)	4	725	0.0	2.0	0	123400	0.0	4.9
Misc. petroleum and coal products(354)	0	14	0.0	0.0	0	500	0.0	0.0
Rubber products(355)	60	226	0.3	0.6	800	16100	0.2	0.6
Plastic products(356)	374	966	1.7	2.7	9400	74100	2.3	3.0
Pottery,china,earthenware(361)	38	112	0.2	0.3	400	7600	0.1	0.3
Glass and products(362)	346	826	1.6	2.3	8100	72400	2.0	2.9
Other non-metallic mineral prod.(369)	787	1977	3.6	5.4	13800	118100	3.3	4.7
Iron and steel(371)	39	175	0.2	0.5	600	9200	0.1	0.4
Non-ferrous metals(372)	52	2196	0.2	6.0	600	139400	0.1	5.6
Fabricated metal products(381)	651	1879	3.0	5.2	7500	81700	1.8	3.3
Machinery,except electrical(382)	197	448	0.9	1.2	6000	44300	1.5	1.8
Machinery electric(383)	192	277	0.9	0.8	3200	18200	0.8	0.7
Transport equipment(384)	39	598	0.2	1.6	200	42400	0.0	1.7
Professional & scientific equipm.(385)	63	119	0.3	0.3	1200	7900	0.3	0.3
Other manufactured products(390)	76	312	0.3	0.9	600	14200	0.1	0.6

Source: Statistics and Survey Unit, UNIDO.Based on data supplied by the UN Statistical Office, with estimates by the UNIDO Secretariat.

Table A-5. Product mix of traded manufactured goods, 1973, 1978 and 1979

SITC	DESCRIPTION OF TRADE GOODS	EXPORTS 1973 PERCENT IN TOTAL MANUFACTURES	EXPORTS 1978 PERCENT IN TOTAL MANUFACTURES	EXPORTS 1979 PERCENT IN TOTAL MANUFACTURES	EXPORTS 1979 (1000 US $)	IMPORTS 1973 PERCENT IN TOTAL MANUFACTURES	IMPORTS 1978 PERCENT IN TOTAL MANUFACTURES	IMPORTS 1979 PERCENT IN TOTAL MANUFACTURES	IMPORTS 1979 (1000 US $)
01	Meat and meat preparations	1.818	0.014	0.000	2	...	0.013	0.011	83
02	Dairy products and eggs	...	...	0.000	0	...	2.235	1.625	12219
032	Fish n.e.s. and fish preparations	...	...	...	...	...	0.424	0.482	3623
0422	Rice,glazed or polished not otherwise worked	0.000	...	...	...	...	0.000	0.000	0
046	Meal and flour of wheat or of meslin	...	0.023	0.013	43	...	1.459	2.973	22352
047	Meal and flour of cereals,except above	...	...	...	...	...	0.248	0.116	875
048	Cereals preparat. & starch of fruits & vegetab.	...	0.002	0.002	7	...	0.657	0.399	2996
052	Dried fruit	...	0.001	...	...	...	0.020	0.008	59
053	Fruit,preserved and fruit preparations	0.003	0.018	0.018	60	...	0.016	0.020	153
055	Vegetables,roots & tubers,preserved or prepared	0.012	...	...	...	...	0.028	0.033	251
06	Sugar,sugar preparations and honey	4.233	5.230	9.366	30942	...	0.142	0.246	1849
0713	Coffee extracts,essences,concentrates & similar	...	...	...	...	...	0.005	0.004	30
0722	Cocoa powder,unsweetened	...	0.017	...	...	...	0.000	0.001	6
0723	Cocoa butter and cocoa paste	0.015	0.665	0.524	1730	...	0.001	0.001	6
073	Chocolate and related food preparations	...	0.022	0.015	50	...	0.113	0.085	841
074	Tea and mate	...	...	...	...	...	0.265	0.146	1099
081	Feeding-stuff for animals	0.004	...	0.682	2253	...	0.187	0.166	1245
09	Miscellaneous food preparations	0.000	...	0.000	1	...	2.333	2.121	15946
11	Beverages	0.175	0.366	0.289	954	...	0.094	0.123	925
122	Tobacco manufactures	0.000	0.008	...	...	...	0.391	0.506	3802
2219	Flour and meal of oil seeds,nuts,kernels	...	...	...	...	...	0.000	...	...
231	Crude rubber,synth. & reclaimed(excl.SITC 2311)	0.012	0.000	0.000	0	...	0.055	0.072	541
243	Wood,shaped or simply worked	1.671	3.340	5.107	16874	...	0.000	0.000	2
2626	Wool shoddy	...	...	...	...	...	0.000	...	...
2627	Wool or other animal hair,carded or combed	0.018	...	...	...	...	0.004	0.046	349
2629	Waste of wool and other animal hair n.e.s.	...	...	0.019	62	...	0.022	0.034	253
263	Cotton	4.377	5.426	3.202	10579	...	0.001	0.001	10
266	Synthetic and regenerated(artificial) fibres	...	...	...	...	...	0.365	0.543	4085
267	Waste materials from textile fabrics(incl.rags)	...	...	...	...	...	0.039	0.021	160
332	Petroleum products	...	0.013	2.259	7462	...	1.506	0.926	6965
4	Animal and vegetable oils and fats	...	...	...	...	...	1.049	0.841	6325
411	Animal oils and fats	...	...	...	...	...	0.045	0.017	128
421	Fixed vegetable oils,soft(incl.SITC 422)	...	...	...	...	...	0.770	0.410	3082
431	Animal and vegetable oils and fats processed	...	...	...	...	...	0.235	0.414	3116

Table A-5. (continued)

SITC	DESCRIPTION OF TRADE GOODS	EXPORTS 1973 PERCENT IN TOTAL MANUFACTURES	EXPORTS 1978 PERCENT IN TOTAL MANUFACTURES	EXPORTS 1979 PERCENT IN TOTAL MANUFACTURES	EXPORTS 1979 (1000 US $)	IMPORTS 1973 PERCENT IN TOTAL MANUFACTURES	IMPORTS 1978 PERCENT IN TOTAL MANUFACTURES	IMPORTS 1979 PERCENT IN TOTAL MANUFACTURES	IMPORTS 1979 (1000 US $)
5	Chemicals	4.081	0.210	0.167	552	...	9.182	9.728	73136
51	Chemicals elements and compounds	3.978	0.155	0.094	311	...	1.219	1.478	11114
52	Tar and chemicals from coal,petroleum,nat. gas	...	...	...	...	...	0.001	0.000	2
53	Dyeing,tanning and colouring materials	...	0.001	0.011	35	...	0.606	0.739	5556
54	Medicinal and pharmaceutical products	0.103	0.054	0.062	206	...	3.324	3.283	24680
55	Essential oils and perfume materials	...	...	...	...	...	0.458	0.409	3077
56	Fertilizers,manufactured	...	...	...	...	...	0.269	0.395	2968
57	Explosives and pyrotechnic products	...	...	...	...	...	0.555	0.590	4437
58	Plastic materials,regenerated cellul. & resins	...	...	...	...	...	1.335	1.459	10965
59	Chemical materials and products n.e.s.	...	...	...	...	...	1.415	1.375	10337
6	Manufactured goods classified by material	83.482	83.194	75.861	250627	...	20.665	21.211	159460
61	Leather manufactured n.e.s. & dressed fur skins	0.100	0.081	0.647	2139	...	0.023	0.018	135
62	Rubber manufactures n.e.s.	0.196	0.465	0.127	420	...	2.062	2.285	17177
63	Wood and cork manufactures(excl.furniture)	0.000	1.282	1.570	5185	...	0.322	0.091	687
64	Paper,paper board and manufactures thereof	...	...	0.000	1	...	1.946	2.172	16326
65	Textile yarn,fabrics,made-up articles	0.020	0.041	0.106	352	...	3.290	2.072	15574
66	Non-metallic mineral manufactures,n.e.s.	1.160	0.002	0.002	7	...	1.408	1.797	13509
67	Iron and steel	0.001	...	...	...	...	5.230	5.802	43620
68	Non-ferrous metals	81.868	80.524	72.980	241109	...	0.849	0.845	6355
69	Manufactures of metal,n.e.s.	0.136	0.799	0.428	1413	...	5.536	6.129	46078
7	Machinery and transport equipment	0.070	0.687	1.666	5505	...	51.786	51.751	389052
71	Machinery,other than electric	0.003	0.561	1.460	4825	...	26.997	24.786	186335
72	Electrical machinery,apparatus and appliances	...	...	...	...	...	10.199	8.956	67329
73	Transport equipment	0.067	0.126	0.206	681	...	14.590	18.009	135389
8	Miscellaneous manufactured articles	0.028	0.763	0.810	2675	...	6.693	5.757	43281
81	Sanitary,plumbing,heating & lightning fixtures	...	...	...	...	...	0.668	0.579	4354
82	Furniture	0.009	...	...	...	...	0.286	0.289	2174
83	Travel goods,handbags and similar articles	...	0.025	0.023	75	...	0.023	0.012	92
84	Clothing	0.015	0.658	0.719	2375	...	0.682	0.348	2617
85	Footwear	0.001	...	...	...	...	0.069	0.161	1214
86	Professional,scient. & controll. instruments	0.000	...	...	...	...	1.768	1.541	11588
89	Miscellaneous manufactured articles,n.e.s.	0.004	0.080	0.068	225	...	3.197	2.826	21242
		1973		1978	1979	1973		1978	1979
	TOTAL MANUFACTURES	152822		272493	330377	...		721531	751779
	TOTAL: SITC 5-8 LESS 68 a/	8854		11797	18250	...		631175	658574
	TOTAL TRADED GOODS: SITC 0-9	314547		720923	811283	...		769482	841544

Note:Data and SITC descriptions refer to SITC revision 1

*/ This table is based on the definition of trade in manufactures covering a list of 148 specifically identified SITC 3-digit or 4-digit codes comprising a wide range of processing stages of manufactured goods.

a/ Definition of trade in manufactures SITC 5-8 less 68 is one of the most often found. It covers only items recognized as exclusively manufactured goods,i.e. with a high level of manufacturing content.

Source: UNIDO data base;Information supplied by the United Nations Statistical Office.

Table A-6. Origin of imports by branch of manufacturing, 1979

SITC	DESCRIPTION OF TRADE GOODS	WORLD TOTAL (1000 US$)	DEVELOPING COUNTRIES (PERCENT)	DEVELOPED MARKET ECONOMIES TOTAL (PERCENT)	USA (PERCENT)	EEC (PERCENT)	JAPAN (PERCENT)	CENTRALLY PLANNED DEVELOPED COUNTRIES (PERCENT)
01	Meat and meat preparations	83	4.01	94.91	40.93	50.86	0.67	1.08
02	Dairy products and eggs	12219	19.43	78.22	10.56	64.82	0.00	2.35
032	Fish n.e.s. and fish preparations	3623	88.29	11.49	1.26	6.99	0.52	0.07
0422	Rice,glazed or polished not otherwise worked	0	56.69	43.31	0.00	43.31	0.00	0.00
046	Meal and flour of wheat or of meslin	22352	64.61	35.39	24.56	8.39	0.00	0.00
047	Meal and flour of cereals,except above	875	2.70	97.13	97.11	0.00	0.02	0.00
048	Cereals preparat. & starch of fruits & vegetab.	2996	41.30	58.67	42.80	13.54	0.21	0.00
052	Dried fruit	59	42.71	57.29	57.27	0.02	0.00	0.00
053	Fruit,preserved and fruit preparations	153	21.28	78.41	73.99	2.59	0.23	0.06
055	Vegetables,roots & tubers,preserved or prepared	251	25.29	66.25	40.49	8.93	2.59	0.04
06	Sugar,sugar preparations and honey	1849	44.43	55.57	26.19	26.65	2.01	0.00
0713	Coffee extracts,essences,concentrates & similar	30	98.58	1.23	0.53	0.70	0.00	0.00
0722	Cocoa powder,unsweetened	6	70.50	29.50	27.99	1.51	0.00	0.00
0723	Cocoa butter and cocoa paste	6	12.60	87.40	87.40	0.00	0.00	0.00
073	Chocolate and related food preparations	641	18.87	81.12	4.25	69.31	0.01	0.01
074	Tea and mate	1099	63.84	33.28	0.06	33.15	0.07	0.00
081	Feeding-stuff for animals	1245	56.35	43.65	5.98	18.78	1.79	0.00
09	Miscellaneous food preparations	15946	80.32	19.66	9.80	7.29	0.46	0.00
11	Beverages	925	43.91	53.69	8.52	42.48	0.13	1.86
122	Tobacco manufactures	3802	40.49	59.49	59.27	0.21	0.00	0.02
231	Crude rubber,synth. & reclaimed(excl.SITC 2311)	541	40.19	59.81	45.00	4.84	5.51	0.00
243	Wood,shaped or simply worked	2	1.50	98.51	0.00	98.51	0.00	0.00
2627	Wool or other animal hair,carded or combed	349	99.99	0.01	0.00	0.00	0.00	0.00
2629	Waste of wool and other animal hair n.e.s.	253	100.00	0.00	0.00	0.00	0.00	0.00
263	Cotton	10	0.00	100.00	100.00	0.00	0.00	0.00
266	Synthetic and regenerated(artificial) fibres	4085	24.21	75.05	25.90	39.22	9.09	0.00
267	Waste materials from textile fabrics(incl.rags)	160	1.03	98.87	72.19	17.07	0.00	0.10
332	Petroleum products	6965	70.91	29.09	18.11	8.25	2.09	0.00
4	Animal and vegetable oils and fats	6325	69.25	30.74	10.19	19.08	0.00	0.00
411	Animal oils and fats	128	28.34	71.66	0.08	67.54	0.00	0.00
421	Fixed vegetable oils,soft(incl.SITC 422)	3082	77.11	22.87	19.58	0.46	0.00	0.00
431	Animal and vegetable oils and fats processed	3116	63.15	36.85	1.32	35.52	0.00	0.00

Table A-6. (continued)

SITC	DESCRIPTION OF TRADE GOODS	WORLD TOTAL (1000 US$)	DEVELOPING COUNTRIES (PERCENT)	DEVELOPED MARKET ECONOMIES TOTAL (PERCENT)	USA (PERCENT)	EEC (PERCENT)	JAPAN (PERCENT)	CENTRALLY PLANNED DEVELOPED COUNTRIES (PERCENT)
5	Chemicals	73136	32.51	66.69	19.23	37.45	1.08	0.38
51	Chemicals elements and compounds	11114	18.23	80.99	19.27	54.74	0.92	0.58
52	Tar and chemicals from coal,petroleum,nat. gas	2	96.22	3.78	3.78	0.00	0.00	0.00
53	Dyeing,tanning and colouring materials	5556	18.86	78.56	13.61	54.91	0.79	1.94
54	Medicinal and pharmaceutical products	24680	44.30	55.32	5.66	30.75	0.71	0.36
55	Essential oils and perfume materials	3077	14.85	85.13	21.56	56.05	0.23	0.01
56	Fertilizers,manufactured	2968	5.81	93.55	37.55	52.92	3.06	0.65
57	Explosives and pyrotechnic products	4437	65.14	30.65	11.56	17.10	1.96	0.00
58	Plastic materials,regenerated cellul. & resins	10965	28.24	71.43	22.45	44.37	2.21	0.00
59	Chemical materials and products n.e.s.	10337	30.49	69.36	48.53	16.85	0.38	0.00
6	Manufactured goods classified by material	159460	37.86	57.39	16.30	16.46	17.10	2.50
61	Leather manufactured n.e.s. & dressed fur skins	135	36.91	62.99	21.00	37.00	3.80	0.02
62	Rubber manufactures n.e.s.	17177	34.49	61.71	19.27	4.27	37.10	1.84
63	Wood and cork manufactures(excl.furniture)	687	15.15	82.13	35.92	5.00	6.07	0.86
64	Paper,paper board and manufactures thereof	16326	31.75	51.48	10.80	5.23	0.60	14.89
65	Textile yarn,fabrics,made-up articles	15574	34.30	61.24	23.93	13.18	22.40	0.34
66	Non-metallic mineral manufactures,n.e.s.	13509	60.75	34.99	8.95	15.93	4.83	1.38
67	Iron and steel	43620	38.45	59.05	10.22	13.71	32.69	1.39
68	Non-ferrous metals	6355	56.45	43.00	4.49	20.93	13.06	0.00
69	Manufactures of metal,n.e.s.	46078	33.00	63.16	23.79	28.36	3.31	0.82
7	Machinery and transport equipment	389052	17.99	79.28	37.87	22.34	12.72	1.87
71	Machinery,other than electric	186335	14.51	82.13	31.80	37.31	5.69	2.21
72	Electrical machinery,apparatus and appliances	67329	20.75	77.36	34.28	18.79	13.84	0.59
73	Transport equipment	135389	21.42	76.32	48.00	3.51	21.82	2.04
8	Miscellaneous manufactured articles	43281	32.54	63.69	25.80	20.45	7.50	0.83
81	Sanitary,plumbing,heating & lightning fixtures	4354	59.54	35.12	17.65	11.15	0.86	2.43
82	Furniture	2174	26.85	71.78	37.54	27.57	5.36	0.51
83	Travel goods,handbags and similar articles	92	11.58	80.74	49.04	25.87	2.70	2.04
84	Clothing	2617	10.81	86.16	53.44	16.33	9.65	0.26
85	Footwear	1214	22.32	77.03	50.01	24.61	0.45	0.00
86	Professional,scient. & controll. instruments	11588	18.39	78.20	36.69	25.56	10.56	1.26
89	Miscellaneous manufactured articles,n.e.s.	21242	38.65	57.19	15.44	19.09	7.57	0.40
	TOTAL manufactures	751779	28.98	68.25	28.68	22.15	10.84	1.62
	TOTAL: SITC 5-8 LESS 68 a/	658574	25.00	71.91	30.10	22.49	12.14	1.81
	TOTAL traded goods: SITC 0-9	841544	31.65	65.17	28.75	20.40	9.73	1.45

Note:Data and SITC descriptions refer to SITC revision 1
*/ This table is based on the definition of trade in manufactures covering a list of 148 specifically identified SITC 3-digit or 4-digit codes comprising a wide range of processing stages of manufactured goods.
a/ Definition of trade in manufactures SITC 5-8 less 68 is one of the most often found. It covers only items recognized as exclusively manufactured goods,i.e. with a high level of manufacturing content.
Source: UNIDO data base;Information supplied by the United Nations Statistical Office.
Note: Percentages may not add to 100.0 due to the fact that countries report trade to/from "unspecified areas".

Table A-7. Destination of exports by branch of manufacturing, 1979

SITC	DESCRIPTION OF TRADE GOODS	WORLD TOTAL (1000 US$)	DEVELOPING COUNTRIES (PERCENT)	DEVELOPED MARKET ECONOMIES TOTAL (PERCENT)	USA (PERCENT)	EEC (PERCENT)	JAPAN (PERCENT)	CENTRALLY PLANNED DEVELOPED COUNTRIES (PERCENT)
01	Meat and meat preparations	2	100.00	0.00	0.00	0.00	0.00	0.00
02	Dairy products and eggs	0	100.00	0.00	0.00	0.00	0.00	0.00
046	Meal and flour of wheat or of meslin	43	100.00	0.00	0.00	0.00	0.00	0.00
048	Cereals preparat. & starch of fruits & vegetab.	7	100.00	0.00	0.00	0.00	0.00	0.00
053	Fruit,preserved and fruit preparations	60	100.00	0.00	0.00	0.00	0.00	0.00
06	Sugar,sugar preparations and honey	30942	50.78	49.10	44.65	4.45	0.00	0.00
0723	Cocoa butter and cocoa paste	1730	21.39	78.61	69.50	9.10	0.00	0.00
073	Chocolate and related food preparations	50	0.00	100.00	100.00	0.00	0.00	0.00
081	Feeding-stuff for animals	2253	95.08	4.92	0.00	4.92	0.00	0.00
09	Miscellaneous food preparations	1	100.01	0.00	0.00	0.00	0.00	0.00
11	Beverages	954	79.75	20.25	20.25	0.00	0.00	0.00
231	Crude rubber,synth. & reclaimed(excl.SITC 2311)	0	0.00	0.00	0.00	0.00	0.00	0.00
243	Wood,shaped or simply worked	16874	60.43	37.76	26.18	7.16	3.16	0.00
2629	Waste of wool and other animal hair n.e.s.	62	0.00	100.00	0.00	63.15	0.00	0.00
263	Cotton	10579	19.04	80.96	0.00	77.78	3.19	0.00
332	Petroleum products	7462	0.00	100.00	0.00	100.00	0.00	0.00
5	Chemicals	552	44.00	56.00	0.00	54.76	0.00	0.00
51	Chemicals elements and compounds	311	78.17	21.83	0.00	21.83	0.00	0.00
53	Dyeing,tanning and colouring materials	35	0.00	100.00	0.00	80.28	0.00	0.00
54	Medicinal and pharmaceutical products	206	0.00	100.00	0.00	100.00	0.00	0.00
6	Manufactured goods classified by material	250627	20.09	62.17	38.17	22.23	1.55	17.74
61	Leather manufactured n.e.s. & dressed fur skins	2139	71.80	28.20	0.00	14.93	2.44	0.00
62	Rubber manufactures n.e.s.	420	100.00	0.00	0.00	0.00	0.00	0.00
63	Wood and cork manufactures(excl.furniture)	5185	29.51	70.29	5.18	3.45	57.34	0.00
64	Paper,paper board and manufactures thereof	1	0.00	100.00	0.00	100.00	0.00	0.00
65	Textile yarn,fabrics,made-up articles	352	22.44	77.56	52.59	10.42	10.20	0.00
66	Non-metallic mineral manufactures,n.e.s.	7	92.31	7.69	6.33	1.36	0.00	0.00
68	Non-ferrous metals	241109	19.39	62.17	38.93	22.87	0.34	18.44
69	Manufactures of metal,n.e.s.	1413	1.74	98.26	96.57	1.63	0.06	0.00
7	Machinery and transport equipment	5505	99.57	0.43	0.00	0.43	0.00	0.00
71	Machinery,other than electric	4825	99.51	0.49	0.00	0.49	0.00	0.00
73	Transport equipment	681	100.00	0.00	0.00	0.00	0.00	0.00
8	Miscellaneous manufactured articles	2675	9.64	90.24	18.07	54.93	0.64	0.00
83	Travel goods,handbags and similar articles	75	0.36	99.64	6.33	88.35	0.00	0.00
84	Clothing	2375	2.39	97.48	19.38	58.84	0.72	0.00
89	Miscellaneous manufactured articles,n.e.s.	225	89.36	10.64	8.24	2.40	0.00	0.00
	TOTAL manufactures	330377	26.53	59.91	35.06	23.03	1.45	13.46
	TOTAL: SITC 5-8 LESS 68 a/	18250	52.48	47.44	12.61	12.90	16.87	0.00
	TOTAL traded goods: SITC 0-9	811283	31.81	62.60	29.65	26.04	2.62	5.53

Note:Data and SITC descriptions refer to SITC revision 1
*/ This table is based on the definition of trade in manufactures covering a list of 148 specifically identified SITC 3-digit or 4-digit codes comprising a wide range of processing stages of manufactured goods.
a/ Definition of trade in manufactures SITC 5-8 less 68 is one of the most often found. It covers only items recognized as exclusively manufactured goods,i.e. with a high level of manufacturing content.
Source: UNIDO data base;Information supplied by the United Nations Statistical Office.
Note: Percentages may not add to 100.0 due to the fact that countries report trade to/from "unspecified areas".

Table A-8. Shares of exports and imports classified according to level of processing, 1970 and 1979, and trend growth rates, 1970-1975 and 1975-1979

CLASSES	EXPORTS				IMPORTS			
	CLASS SHARE OF TOTAL (PERCENTAGE)		CLASS GROWTH RATE (PERCENTAGE)		CLASS SHARE OF TOTAL (PERCENTAGE)		CLASS GROWTH RATE (PERCENTAGE)	
	1970	1979	1970-1975	1975-1979	1970	1979	1970-1975	1975-1979
A : Non-processed goods for further processing	54.63	44.87	24.84	8.70	2.68	4.93	34.71	25.25
B : Processed goods for further processing	4.27	3.88	57.03	-21.56	19.37	9.56	28.64	-6.17
C : Non-processed goods for final use	0.54	13.41	96.79	24.28	0.90	0.65	23.28	14.20
D : Processed goods for final use	40.56	37.83	16.85	15.25	77.06	84.87	30.43	13.00
	1970	1979			1970	1979		
Sum of classes: A+B+C+D in 1000 current US$	225421	811283			159153	840017		
Total trade SITC 0-9 in 1000 current US$	225421	811283			159153	841544		

SOURCE: UNIDO data base; Information supplied by the United Nations Statistical Office, with estimates by the UNIDO Secretariat.

Note: Calculations are based on current us dollar prices.
Sum of classes and Total trade figures should be identical. Discrepancies or zero values are due to lack of countrys" trade reporting in general, but especially at the 3-, 4- and 5-digit SITC level.

Table A-9. Composition and value of trade, 1978 and 1979

BOLIVIA

Description of traded goods (SITC)	Imports (Percentage of total trade)		Exports (Percentage of total trade)		Trade balance (Exports less imports in 1000 current US $)	
	1978	1979	1978	1979	1978	1979
OILS AND FATS						
Animal oils and fats(411)	0.0	0.0	...	...	...	...
Fixed vegetable oils and fats(421/2)	0.7	0.4	0.0	0.0	-5554.7	-3082.0
Processed animal and vegetable oils and fats(431)	0.2	0.4	...	...	...	...
CHEMICALS						
Organic chemicals(512)	0.5	0.5	0.1	0.0	-3128.8	-4039.2
Inorganic chem., oxides and halogen salts(513/4)	0.7	0.8	0.0	0.0	-5239.4	-6751.0
Dyeing, tanning and colouring materials(531)	0.2	0.3	...	...	...	...
Medicinal and pharmaceutical products(541)	3.1	2.9	0.0	0.0	-23839.0	-24473.3
Plastics, cellulose and artificial resins(581)	1.3	1.3	...	...	...	...
FERTILIZERS						
Nitrogenous fertilizers & related materials(5611)	0.1	0.1	...	...	...	...
Phosphatic fertilizers and related materials(5612)	0.0	0.1	...	...	...	...
Potassic fertilizers and related materials(5613)	0.0	0.0	...	...	...	...
PETROLEUM						
Petroleum, crude or partly refined(331)	0.0	0.0	5.9	...	42323.8	...
Petroleum products(332)	1.4	0.8	0.0	0.9	-10834.4	497.0
RUBBER						
Crude rubber, synthetic and reclaimed(231)	0.1	0.1	0.1	0.2	336.8	819.6
Rubber materials, e.g.sheets, threads, piping(621)	0.2	0.1	0.2	0.1	6.3	-766.8
Articles of rubber, e.g. tyres, tubes(629)	1.8	1.9	...	...	...	...
WOOD AND FURNITURE						
Wood, shaped or simply worked(243)	0.0	0.0	1.3	2.1	9102.1	16871.9
Pulp paper, including waste(251)	...	...	...	...	...	...
Veneers, plywood, improved wood(631)	0.0	0.0	0.5	0.5	3180.3	4358.8
Wood manufactures(632)	0.2	0.0	0.0	0.1	-1685.8	466.1
Paper and paperboard(641)	1.6	1.7	...	0.0	...	-14596.5
Articles of pulp, paper or paperboard(642)	0.2	0.2	...	...	...	...
Furniture(821)	0.3	0.3	...	...	...	...
TEXTILES AND CLOTHING						
Wool and other animal hair(262)	0.0	0.1	0.1	0.0	151.3	-357.2
Cotton(263)	0.0	0.0	2.1	1.3	14777.0	10569.3
Jute(264)	0.0	...	...	...	...	...
Vegetable fibres, flax and hemp(265)	0.0	0.0	...	...	...	...
Synthetic and regenerated fibres(266)	0.3	0.5	...	...	...	...
Textile yarn and thread(651)	1.0	0.6	...	...	...	...
Woven cotton fabrics(652)	0.1	0.1	...	...	...	...
Woven textile fabrics(653)	1.2	0.7	0.0	0.0	-8892.9	-5529.8
Made-up articles chiefly of textiles(656)	0.4	0.2	0.0	0.0	-2847.7	-1543.1
Travel bags, handbags, etc.(831)	0.0	0.0	0.0	0.0	-96.6	-16.3
Clothing, excluding leather(841 less 8413)	0.6	0.3	0.2	0.3	-3070.0	-194.1
Calf leather(6113)	0.0	0.0	...	...	...	...
LEATHER AND PRODUCTS						
Other leather, including artificial(611 less 6113)	0.0	0.0	0.0	0.3	191.0	2128.0
Leather manufactures(612)	0.0	0.0	0.0	...	-102.8	...
Apparel and accessories of leather(8413)	0.0	0.0	0.0	0.0	-63.3	-49.0
Footwear(85)	0.1	0.1	...	...	...	...
BUILDING MATERIALS AND GLASS						
Lime, cement, fabricated building materials(661)	0.3	0.4	...	...	...	...
Construction and refractory materials of clay(662)	0.2	0.3	...	...	...	...
Glass(664)	0.4	0.4	...	...	...	...
Glassware and pottery(665/6)	0.2	0.3	0.0	0.0	-1807.5	-2165.1

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Table A-9. (continued)

BOLIVIA

Description of traded goods (SITC)	Imports (Percentage of total trade)		Exports (Percentage of total trade)		Trade balance (Exports less imports in 1000 current US $)	
	1978	1979	1978	1979	1978	1979
IRON AND STEEL						
Iron ore and concentrates(281)	0.0	...	0.0	0.0	197.8	...
Iron and steel scrap(282)	0.0	0.0	...	...	...	...
Pig iron and sponge(671)	0.1	0.1	...	...	...	...
Ingots and other primary forms(672)	0.0	0.0	...	...	...	...
Bars, rods, shapes, sections(673)	1.1	1.5	...	...	...	...
Universals, plates and sheets(674)	1.8	2.0	...	...	...	...
Hoop and strip(675)	0.0	0.0	...	...	...	...
Iron and steel wire(677)	0.0	0.1	...	...	...	...
Tubes, pipes and fittings(678)	1.7	1.2	...	...	...	...
Unworked castings and forgings(679)	0.1	0.0	...	...	...	...
NON-FERROUS METALS						
Non-ferrous ore and concentrates(283)	0.0	0.0	35.6	32.7	256579.6	265052.1
Copper, blister, refined, alloys(6821)	0.0	0.0	...	...	...	...
Copper bars, shapes, sections, wire, etc.(6822)	0.1	0.2	...	...	...	...
Aluminium, unwrought or worked(684)	0.4	0.4	...	...	...	...
Lead, unwrought or worked(685)	0.0	0.0	0.1	0.2	686.1	1927.5
Zinc, unwrought or worked(686)	0.2	0.2	...	...	...	...
Tin and alloys, unwrought or worked(687)	0.0	0.0	29.6	28.6	213317.9	231635.8
Wire products, e.g. cables, ropes(693)	0.4	0.3	...	...	...	...
SELECTED CAPITAL GOODS						
Hand tools used in agriculture(6951)	0.1	0.1	...	...	...	...
Tools for use in hand or machine(6952)	0.9	1.1	...	0.0	...	-9127.2
Power generating machinery, non-electric(711)	2.0	1.9	0.0	...	-15192.7	...
Agricultural machinery(7121/2)	0.7	0.4	0.0	0.0	-5340.4	-3623.6
Dairy equipment(7123)	0.0	0.1	...	...	...	...
Tractors(7125)	1.8	1.1	...	...	...	...
Office machines(714)	0.6	0.6	...	...	...	...
Metal working machinery(715)	0.7	0.8	...	...	...	...
Textile and leather machinery(717)	1.4	1.4	...	...	...	...
Machines for paper, pulp and paper articles(7181)	0.2	0.2	...	...	...	...
Industrial food-processing machinery(7183)	1.5	0.7	...	...	...	...
Machine tools for working minerals,wood,etc.(7195)	0.9	0.7	0.1	0.2	-5985.3	-4717.2
Electrical power machinery and switchgear(722)	1.9	2.2	...	...	...	...
MAJOR CONSUMER DURABLES						
Commercial road vehicles(732 less 7321)	8.1	7.1	0.0	0.0	-61988.5	-59586.2
Passenger motor cars(7321)	3.0	3.7	...	...	...	...
Television and radio sets(7241/2)	2.0	2.1	0.0	0.0	-15391.9	-17613.7
Domestic electrical equipment(725)	0.8	0.7	...	...	...	...
TOTAL OF ABOVE, IN MILLIONS OF US $	385	395	547	548	161	153
TOTAL TRADE (SITC 0 TO 9), IN MILLIONS OF US $	769	842	721	811	-49	-30

Source: Statistics and Survey Unit, UNIDO.Based on data supplied by the UN Statistical Office, with estimates by the UNIDO Secretariat.

Table A-10. Average apparent consumption of selected manufactures, 1979-1981

BOLIVIA

Product grouping and commodity (ISIC)		Unit	Average apparent consumption per 1000 inhabitants	Imports: As percentage of apparent consumption	Exports: As percentage of apparent consumption	Average annual production	Growth rate of apparent consumption
			1979-1981	1979-1981	1979-1981	1979-1981	1970-1981
FOOD PRODUCTS							
Raw sugar (311801)	a/	W	50.03	0.1	0.0	275000	12.18
Refined sugar (311804)	a/	W	22.19	0.0	79.2	218636	1.32
Cocoa powder (311907)	a/	V	0.14	4.4	13.6	843	2.07
Cocoa butter (311910)	a/	W	0.11	0.0	27.8	805	-8.32
Chocolate and chocolate products (311913)	b/	W	0.10	33.0	2.8	372	11.54
Prepared animal feeds (312201)	b/	W	8.49	2.4	0.0	45000	81.01
OILS AND FATS							
Oils and fats of animals, unprocessed (311507)		W	...	...	...	...	...
Oils of vegetable origin (311510*)	b/	W	2.81	28.0	0.0	11000	15.93
TEXTILES							
Wool yarn, pure and mixed (321103)	b/	W	0.00	30.3	2.5	18	-41.84
Cotton yarn, pure and mixed (321109)	b/	W	0.19	1.4	0.0	1002	1.53
Cotton woven fabrics (321128)	b/	S	2209.95	0.0	0.0	12000000	-3.66
Woollen woven fabrics (321134)	b/	S	168.89	55.8	0.3	40000	-26.21
Knitted fabrics (321301)		W	...	...	...	...	...
FOOTWEAR							
Footwear, excluding rubber footwear (324000)	a/	P	1147.54	3.4	0.0	6100000	11.81
WOOD AND WOOD PRODUCTS							
Veneer sheets (331110)		V	2.11	0.2	79.1	21000	237.58
Particle board (331122)		V	...	...	...	...	...
PAPER AND PAPER PRODUCTS							
Wood pulp, mechanical (341101)	a/	W	0.00	...	...	0	-56.44
Pulp of fibres other than wood (341104)	a/	W	0.18	3.2	4.4	1000	7.78
Wood pulp, dissolving grades (341107)		W	...	...	...	...	16.67
Wood pulp, sulphate and soda (341110)	a/	W	0.00	100.0	0.0	0	24.97
Wood pulp, sulphite (341113)		V	...	...	...	...	...
Wood pulp, semi-chemical (341116)	a/	V	0.00	...	...	0	...
Newsprint (341119)		W	...	...	...	...	...
Other printing and writing paper (341122)		W	1.22	100.0	0.0	0	18.63
Kraft paper and kraft paperboard (341125)		W	...	...	...	...	...
Other paper and paperboard (341131)		W	0.57	68.3	0.0	1000	3.36
INDUSTRIAL CHEMICALS							
Methanol (methyl alcohol) (351121)	b/	W	0.04	100.0	0.0	0	19.91
Glycerine (glycerol) (351125)	b/	W	0.01	100.0	0.0	0	18.33
Chlorine (351145)	a/	W	0.01	100.0	0.0	0	40.70
Sulphuric acid (351147)	b/	W	0.56	1.1	0.0	3000	14.83
Nitric acid (351149)	b/	W	0.01	100.0	0.0	0	20.87
Zinc oxide (351154)	b/	W	0.01	100.0	0.0	0	10.75
Titanium oxides (351155)	b/	W	0.05	100.0	0.0	0	9.67
Lead oxides (351157)		W	...	...	...	...	...
Ammonia (351158)		W	...	...	...	...	...
Caustic soda (351159)		W	...	...	...	...	...
Soda ash (351166)	b/	W	0.78	100.0	0.0	0	4.01
Hydrogen peroxide (351171)	b/	W	0.00	100.0	0.0	0	-2.42
Calcium carbide (351173)		W	...	...	...	...	...
Dyestuffs, synthetic (351174)	b/	W	0.07	100.0	0.0	0	19.48
Vegetable tanning extracts (351175)	a/	W	0.11	100.0	0.0	0	11.23
Nitrogenous fertilizers (351201)	a/	W	1.32	100.0	0.0	0	1.48
Phosphatic fertilizers (351204 + 351207)		V	0.29	100.0	0.0	0	2.86
Potassic fertilizers (351210)	a/	W	0.03	100.0	0.0	0	2.76
Insecticides, fungicides, etc. (351216)		W	...	...	...	...	...
Rubber, synthetic (351301)	a/	W	0.09	100.0	0.0	0	4.31
Non-cellulosic staple and tow (351304)	a/	W	0.33	100.0	0.0	0	42.01
Regenerated cellulose (351331)	a/	W	0.06	100.0	0.0	0	-0.70

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Table A-10. (continued)

BOLIVIA

Product grouping and commodity (ISIC)		Unit	Average apparent consumption per 1000 inhabitants	Imports (As percentage of apparent consumption)	Exports (As percentage of apparent consumption)	Average annual production	Growth rate of apparent consumption
			1979-1981	1979-1981	1979-1981	1979-1981	1970-1981
PETROLEUM REFINERIES							
Motor gasolene (353007A)		V	67.28	0.0	20.1	450333	6.71
Kerosene (353013A)		V	21.41	0.0	0.0	119333	0.76
Distillate fuel oils (353019A)		V	...	...	...	...	14.80
Residual fuel oils (353022A)	c/	V	20.19	87.7	0.0	14000	-0.98
Lubricating oils (353025A)		V	4.07	0.0	0.0	22667	12.19
Liquefied petroleum gas (353037A)		V	15.13	0.0	11.5	94000	34.32
GLASS AND CEMENT							
Glass bottles and containers (3620108)	b/	W	2.13	7.8	0.0	10667	17.62
Cement (369204)	a/	W	55.11	15.5	0.1	25650C	9.75
IRON AND STEEL							
Pig iron (371007 + 371010)	a/	W	0.11	100.0	0.0	0	20.39
Wire rods (371028)	a/	W	1.25	100.0	0.0	0	40.06
Angles, shapes and sections (371035)	a/	W	1.37	100.0	0.0	0	13.30
Plates(heavy), over 4.75 mm. (371040)	a/	W	0.38	100.0	0.0	0	28.27
Plates(medium), 3 to 4.75 mm. (371043)	a/	W	0.19	100.0	0.0	0	-5.45
Plates and sheets, < 3 mm. (371046 + 371049 + 371052)	a/	W	3.63	100.0	0.0	0	24.03
Tinplate (371055)	a/	W	0.65	100.0	0.0	0	8.49
Railway track material (371067)	a/	W	0.43	100.0	0.0	0	2.29
Wire, plain (371070)		W	...	...	...	...	...
Tubes, seamless (371076)	a/	W	1.12	100.0	0.0	0	10.10
Tubes, welded (371079)	a/	W	1.11	100.0	0.0	0	-3.59
Steel castings in the rough state (371085)		W	...	...	...	...	...
Steel forgings (371088)		W	...	...	...	...	...
NON-FERROUS METALS							
Copper, refined, unwrought (372004)		W	...	...	...	...	...
Copper bars, rods, angles, etc. (372010 + 372013)		W	...	...	...	...	...
Copper plates, sheets, strip and foil (372016)	b/	W	0.00	100.0	0.0	0	10.18
Copper tubes and pipes (372019)		W	...	...	...	...	...
Aluminium, unwrought (372022)	a/	W	0.07	100.0	0.0	0	108.00
Aluminium bars, rods, angles, etc. (372025 + 372028)	b/	W	0.08	100.0	0.0	0	27.12
Aluminium plates, sheets, strip etc. (372031)	a/	W	0.12	100.0	0.0	0	9.63
Aluminium tubes and pipes (372034)	a/	W	0.00	100.0	0.0	0	38.83
Lead, refined, unwrought (372037)		W	...	...	...	...	...
Zinc, unwrought (372043)	a/	W	0.31	100.0	0.0	0	44.78
Zinc plates, sheets, strip and foil (372046)	b/	W	0.00	100.0	0.0	0	30.93
Tin, unwrought (372049)	d/	W	1.20	0.0	163.2	17533	21.83

Source: Statistics and Survey Unit, UNIDO.
Based on data supplied by the UN Statistical Office, with estimates by the UNIDO Secretariat.

Note: ISIC 311510* consists of 311510 + 311513 + 311516 + 311519 + 311522 + 311525 + 311528 + 311531 + 311534 + 311537.
Growth rates have been calculated on the basis of available annual data over the period indicated.
Footnotes: a/ Data for 1981 not available.
b/ Data for 1979 only.
c/ Data for 1979 not available.
d/ Data for 1980 only.

Table A-11. Human resources for industry and technology, selected years

I. (I.L.O. 1976) Total employment in manufacturing 145,404

of which

Technical and scientific personnel 1,330

Managerial staff 2,087

Administrative personnel 4,403

II. Education Third level (UNESCO)

Enrolement per 100,000 inhabitants - 1978 MF 1042

M 1443

653

Students by field of study (1976-1978)

	1976	1977	1978
Natural science	1061	965	687
Engineering	6941	8852	8970

Graduates by field of study (1978)

Commercial and business admin. 61

Natural Science 24

Mathematics and computer science 305

Engineering 107

Potential scientists and engineers (per 1,000,000 population) 10,035 (1976)

Scientific and technical manpower: potential scientists and engineers 58,090 (1976)

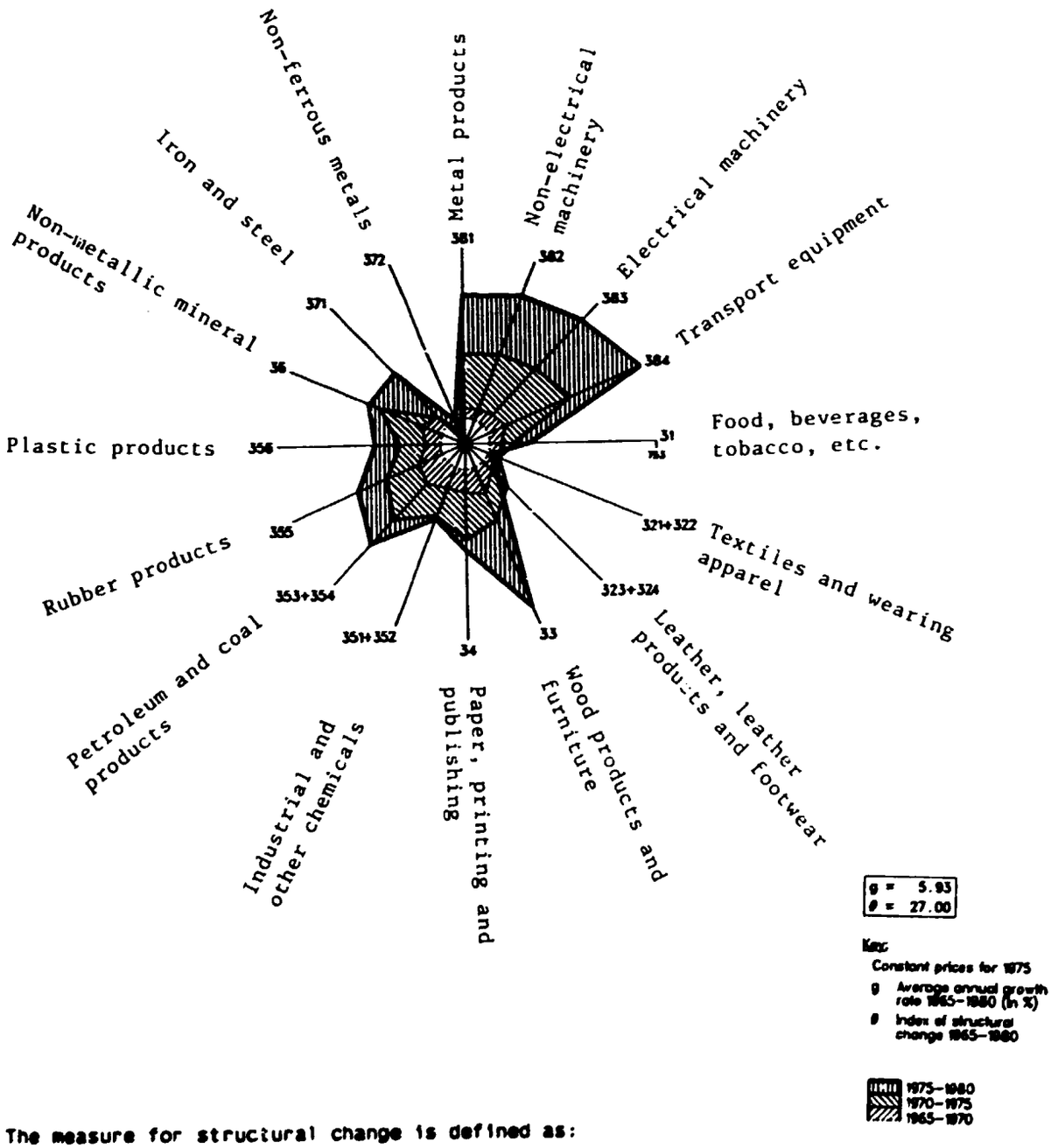
III. Research and Development (JUNAC)

1979 Total R & D expenditure US$ 6 million

As percentage of GDP = 0.07 per cent

Researchers: 8.6 per 100,000 inhabitants.

Table A-12. Industrial structural change, 1965-80
(Index of value added: 1965:100)



The measure for structural change is defined as:

$$\cos \theta = \frac{\sum_i s_i(t).s_i(t-1)}{\sqrt{\left(\sum_i s_i(t)^2\right).\left(\sum_i s_i(t-1)^2\right)}}$$

where $s_i(t)$ is the share of the i-th branch of value added in total value added in the year t.

The value θ can be interpreted as the angle between the two vectors $s_i(t-1)$ and $s_i(t)$ measured in degrees.

Source: UNIDO, Industry and Development, Global Report, 1985.

Appendix B

The approved and/or operational technical co-operation projects of UNIDO

(Spec.Act.Code)	Project Number	Project Title
IO/PLAN (31.2.A)	DP/BOL/82/004*	Integral assistance to industry
IO/PLAN (31.2.B)	SI/BOL/82/803	High-level advice to the Ministry of Industry in industrial policies
IO/AGRO (31.7.A)	US/BOL/84/206	Apoyo a rehabilitación de puentes en areas declaradas en emergencia
IO/MET (31.8.C)	SI/BOL/85/802	Choice and formulation of technological process routes for iron and steel production in Bolivia based on domestic raw materials and natural resources
IO/MET (31.8.D)	SI/BOL/85/801	Advisory mission on the change-over from liquid to gas fuel for the tin smelting furnaces of Empresa Nacional de Fundiciones
IO/CHEM (32.1.A)	SI/BOL/80/802	Development of cement factory in Sevaruyo
IO/CHEM (32.1.B)	IW/BOL/80/002	Upgrading of the technologies used by women potters in the Cochabamba Valley
IO/CHEM (32.1.B)	SI/BOL/84/801	Assistance to the 'CRIOSAL' glass factory

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

Appendix C. Major Bolivian Companies, 1984 [a/]

(Values in $ million)

Rank	Company	Type of Business	Sales/ Turnover
1	YPFB - Yacimientos Petroliferos Fiscales Bolivianos	Petro sales	380 [b/]
2	Comibol - Corporacion Minera de Bolivia	Mining	350 [b/]
3	Nacional de Fundiciones [c/]	Metals	139.7
4	Lloyd Aerro Boliviano	Airline	37.4 [c/]
5	Emp. Constructora Bartos y Cia	Construction	35.7 [c/]
6	Ferrocarriles Bolivianos	Railray	34.9
7	Soc. Comericial e Industrial	Retail	31.6 [b/]
8	Cerverceria Bolivianas Nacional	Brewery	28.7
9	Toyota de Bolivia	Autos and parts	28.5
10	Grupo Comsur - Co. Minera del Sur	Mining	25

Source: South, January 1985.

a/ The list has to be read with a degree of care as much of the information is dated or estimated. Two large groups, Grupo INRO, control 70 companies operating right across the economy and including cement, glass, vegetable oils, sugar and commerce. It is certain that the sales of these groups are as high if not higher than most of the companies listed but as no details are available it has not been possible to include them. It is also impossible to list those enterprises dealing with narcotics because of lack of knowledge concerning their performance. The contribution to the economy of these operations has, according to the US Narcotics Bureau, been considerable.

b/ Another source gives turnover for YPFB as US$257.9m., Comibol US$203.8m., CBN US$14.7m.

c/ 1977 figures.

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