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EVOLUTION OF, AND PROSPECTS FOR, THE MINING SECTOR IN LATIN AMERICA *

* This document was prepared by the Natural Resources Division. It is a preliminary version, subject to revision both in form and content, and the purpose of distributing it to authorities and technical experts in the mining sectors of the countries and bodies of the region is to obtain comments, observations and contributions of an informational and statistical nature.

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/Introduction

Introduction

1. The industrialized countries per capita output of minerals and fuels is two and a half times greater than that of the developing countries, while the consumption of the former is sixteen times greater, with the result that they require a considerable amount of raw materials from the developing countries. In fact, 70% of world exports come from developing countries. However, the income of those countries normally represents less than 25% of the final price to the consumer. This situation highlights the opportunity that the developing countries have of increasing the returns on exportation of their mining resources through enhancement of their bargaining positions and advances in industrial processing, thus generating substantial financial resources for developing the countries in question.

2. Latin America not only has this position in common with the other developing regions, its share in world trade in the products in question and of world investment in mining prospection and exploration is decreasing. At the same time, its requirements for engineering products are growing steadily, which means that an adequate pattern of local inputs must be developed in the sector in question. If the above-mentioned trend is to be reversed and a contribution is to be made to stepping-up development of engineering on a metallurgical basis, it would be necessary to redefine the strategic value of the mining and metallurgical extraction industry through analysis of its possibilities and implementation of a programme of co-operative action leading to greater knowledge of the region's mining potential and improved organization of its output and marketing.

3. The present study forms part of a series of four documents, the purpose of which is to promote more in-depth analysis of the possibilities of the mining and metallurgical sector and to provide one of the frameworks for formulation of programmes and projects concerning horizontal co-operation in developing the region's mineral resources.

4. Inadequate statistical information has meant that it has not been possible to give concepts the same treatment, since in a number of cases the data concerns all forms of mining and in other cases it concerns only mining of metals, with an indication of the concepts in question being given in each case. At the same time, analysis is generally focused on the characteristics of large and medium-scale mining, and those of small-scale mining, which deserve more specific treatment, are not covered.

Summary

Summary

5. Assuming that the economic and social development of countries depends on growth in the productivity of their sectors and the increased availability of strategic factors relating to production, mining, owing to its greater potential for generating financial surpluses, is one of the sectors whose expansion can help to generate and maintain such development. Specifically, the mining sector could make a contribution to:1/

(a) Net generation of foreign currency,

(b) Increased government revenue; the resources in question are generally publicly owned, which gives the government the necessary basis for having a greater share in the surplus generated;

(c) Development of the pattern of production in the context of a strategy for integrating the industrial sector;

(d) Local or regional expansion of the industrial sector's areas of influence, a process whose centre or focus could be constituted by mining;

(e) Generation of high-productivity employment.

6. The producing countries' experience has so far not been at all favourable; in fact, in many cases the contribution made by mining to national development has been minimal, as it was based on external dependence, which had a number of negative effects. Despite the progress made over the past fifteen years in a number of the region's producing countries, the mining sector has not had the necessary support where investment is concerned, owing to the high degree of uncertainty relating to such investment. Substantial fluctuations in international prices, expectations that there will be slower expansion of demand in the major consumer centres, lack of financial resources for prospection and exploration of new deposits are not only working against the implementation of development plans, but are also forming an obstacle to expectations relating to future world supply. Despite these considerations, the region must not fail to exploit the advantages arising from possession of the resources in question. If that goal is to be attained, it will be necessary to solve not only problems relating to financing and international trade but also those resulting from the very nature of the sector itself.

1/ See United Nations, E/C.7/97.

/Basically, it

Basically, it is necessary to identify and measure the proportions of mining revenue that are to be distributed among the producing countries, the institutions that contribute capital and technology and those that play a role in the marketing process. Secondly, in view of the fact that mineral deposits are a non-renewable resource, the producing country must transform that resource into other forms of reproductive capital and use the surplus generated by mining for financing further projects.

7. The following characteristics constitute the basic aspects of world output and marketing of minerals:

(a) Prices are chiefly determined by the evolution of, and fluctuations in, demand, which is shaped by immediate utilization of the product in question and the establishment of commercial stocks and strategic reserves. The fact that there is no open market for a number of minerals is one of the factors responsible for the high level of uncertainty with regard to estimates concerning future revenue and investment decisions.

(b) The activities of the mining and metallurgical sector call for extremely high levels of capital density and, therefore, high levels of investment. It is estimated that in the year 2000 investment on the part of the developing countries could reach the approximate level of US$ 70 000 million in terms of 1980 prices. The average for the past decade fluctuated at around US$ 15 000 million.2/ In such circumstances it is possible that domestic saving and traditional sources of financing will not be sufficient to meet such investment requirements and will have to be supplemented by credits from the consumer countries, suppliers of machinery, transnational corporations and other institutions involved in the production and marketing process.

(c) Studies indicate that over 75% of current world mineral reserves are concentrated in only fourteen countries, among which are Bolivia, Brazil, Chile, Mexico and Peru.3/ However, it must be

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2/ See Mikesell.

3/ See Nankani.

/borne in

borne in mind that the assessment of "economically exploitable" reserves is to a great extent influenced by price fluctuations, since it is related to the cost of mining and obtaining the fine metal. Although in absolute terms existing reserves are sufficient to meet the demand of the coming decades, there are two problems relating to the supply of minerals; one of these problems is that of finding the funds to meet the high investment requirements and the other is the gradual rise in the cost of exploiting known deposits. It would be possible to reduce that cost, if prospection and exploration work to identify and evaluate new, higher-yield deposits were stepped up or if the technologies for mining and obtaining the metal were improved. In the specific case of Latin America, if this investment is not rechannelled to such activities soon, the low levels of investment of the 1970s could result in a drop in the rate of output in the course of the current decade.

(d) Projections concerning the demand for minerals 4/ suggest that the long-term prospects for the mining sector are relatively favourable, a situation that will to a great extent depend on the goals, policies, institutions and instruments selected by each of the producing countries for developing the sector in question. In Latin America these prospects will have the following characteristics:

(i) As in the case of all developing economies, the region needs to increase its foreign currency reserves and its internal saving in order to reduce the trade deficit and the deficit in investment financing. For the following reasons, mining may have a high potential for generating foreign currency and revenue for the public sector; throughout the world metal ingots are a homogeneous product and are therefore equally competitive on the international market. In general, mining legislation stipulates that the resources of the subsoil are public property, which can make it easier for the State to obtain a major proportion of the income generated by mining.

4/ See Leontief.

/(ii) Metal

(ii) Metal and engineering products originating from mining and metallurgical production account for about 40% of Latin American imports. Such products,have a higher income elasticity of demand than that of other industrial products, which means that their import volume will rise, if a large-scale production process is not stepped up at the regional level. However, one of the basic prerequisites for such a process is industrial complementation and integration, in view of the relatively small size of domestic markets compared with the scale and degrees of diversification of the output in question and the uneven growth of demand in the various lines of business. In this connexion, joint action could be undertaken, from preparation of studies and mining prospection to agreements on industrial complementation and co-production.

8. The various chapters would seem to establish the need to bring about joint action on the part of the countries of the region with a view to achieving the following major goals:

(a) Enhanced bargaining power in order to obtain a greater share of world trade and revenue from mining.

(b) Securing financial resources in order to expand prospection and exploration for, and process of minerals.

(c) Vertical integration of the production process in order to make rapid progress in industrializing products resulting from the mining industry.

I. ROLE AND IMPORTANCE OF THE MINING SECTOR IN THE LATIN AMERICAN ECONOMY

9. In the context of the development theories of the classical and neoclassical schools, which were based on production functions, natural resources were one of the chief strategic factors in development. Practical application of such models encountered the difficulty of measuring adequately the wealth represented by such resources, which is subject to constant reassessment. Subsequently, Keynesian theory and models centered on global demand focused analysis of the evolution of its components and on capital formation, with the result that natural resources to a greater extent lost their characteristics as a strategic variable. Modern theory is once again according a relative degree of importance to the role of natural resources in the development process, attributing, for example, to mining a strategic value in expanding exports and, consequently, in generating foreign currency (Perloff and Dodds in 1963); and in increasing public sector income as a primary formation of an exhaustable resource that can be transformed into other forms of reproductive capital (Solow and Schulze in 1974, Pearce and Rose in 1975).

10. However, the chief characteristics of the actual evolution of the mining and metallurgical sector at the international level were as follows:

(a) Growth of the product was lower than that of the overall product, despite the high income elasticity of demand for metals (see table 1).

(b) In a number of developed regions growth of the mining and metallurgical sector exceeded that of the developing regions,5/ which is precisely where approximately 50% of world mineral reserves are located.6/

1. Contribution to the formation of gross domestic product

11. Extractive activities relating to mining, quarrying and hydrocarbons accounted for over 4% of the region's gross domestic product in the period 1950-1979 (see table 2). At the international level the corresponding share was 1% in the developed and centrally planned economies and 2% of the gross

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5/ See ESCAP, E/ESCAP/NR.6/6, 1979.

6/ See Nikesell.

/Table 1

Table 1

EVOLUTION OF THE MINING SECTOR 1960-1979 a/

Regions	Rate of growth of per capita mining GDP as a percentage of the rate of growth of overall per capita GDP	Comparative index of the rate of growth of per capita mining GDP b/
A. Developed regions		
1. Australia, Japan and New Zealand	80	100
2. Western Europe	51	48
3. United States of America and Canada	12	8
B. Developing regions		
1. Latin America	60	41
2. Rest of Asia and the Pacific	91	46

Source: See ESCAP, E/ESCAP/NR.6/6.

a/ Only covers the stage of mining minerals, excluding that of hydrocarbons.

b/ Rate of growth of mining GDP of Australia, Japan and New Zealand = 100.

/Table 2

Table 2

LATIN AMERICA: EVOLUTION OF THE SHARE OF MINING GROSS DOMESTIC PRODUCT a/
IN OVERALL GROSS DOMESTIC PRODUCT

(Percentages)

	1950	1960	1979	Annual rate of growth of mining GDP, 1950-1979 (at constant prices)
Countries with mining economies				
Bolivia	19.7	6.4	5.5	4.42
Chile	12.5	11.1	12.2	4.18
Ecuador	1.2	1.3	6.6	15.64
Guyana	-	-	13.0	-
Jamaica	-	-	8.7	-
Mexico	4.0	4.2	5.1	7.34
Peru	7.0	7.9	8.7	4.69
Dominican Republic	0.3	1.9	5.9	12.60
Venezuela	22.7	27.5	8.0	-0.95
Countries with semi-mining economies				
Argentina	0.6	1.3	1.9	5.63
Brazil	0.4	0.5	0.9	10.50
Colombia	2.5	2.7	1.0	0.52
El Salvador	1.0	0.2	0.1	1.35
Guatemala	0.2	0.2	0.2	7.18
Haiti	3.4	5.0	1.3	-4.98
Honduras	1.9	1.7	1.8	4.69
Nicaragua	1.5	1.1	0.3	-2.65
Panama	0.3	0.3	0.2	5.30
Paraguay	-	0.2	0.6	13.62
Latin America	4.1	4.3	4.3 b/	5.70 b/

Source: See table 1 of the statistical annex and CEPAL, E/CEPAL/1061.

a/ Including extraction of hydrocarbons.
b/ Provisional figures.

/domestic product

domestic product of the developing countries as a whole, thus demonstrating the greater relative importance of such activities in the Latin American economy. These figures are not altogether representative, since they do not include the mining and metallurgical activities' value added, which is considerably higher than that of the purely mining stage. For example, the value added through the manufacture of copper wires is nine times greater than that of the metal mined from a porphyry deposit.7/

12. If the countries in which the value added of such extractive activities accounts for over 5% of the overall product are classified as countries with mining economies, in 1979 the following Latin American countries fell within that category: Bolivia, Chile, Dominican Republic, Ecuador, Guyana, Jamaica, Mexico, Peru and Venezuela.8/ (See table 1 of the statistical annex.) Similarly, countries with semi-mining economies would be those whose mining contribution was below 5%. (See table 2 once again.)

13. In the new group of countries with mining and semi-mining economies in 1979 the contribution made by the product of extractive activities to overall gross domestic product was between 0.1% in the case of El Salvador to 13% in the case of Guyana.

14. In the period 1950-1979 the share of gross domestic product of extractive activities in the overall product grew in a number of countries and decreased in another group of countries. Argentina, Brazil, the Dominican Republic, Mexico, Paraguay, and Peru were in the first group, and Bolivia, Colombia, El Salvador, Haiti, Nicaragua and Venezuela were in the second.

15. In the period 1950-1979 the highest annual growth rates in the product of extractive activities were attained by Brazil (10.50), the Dominican Republic (12.60), Ecuador (15.64), Guatemala (7.18), Mexico (7.34) and Paraguay (13.62). On the other hand, Haiti, Nicaragua and Venezuela had negative rates, estimated in terms of 1970 prices (see table 2 once again).

16. According to a number of studies, over coming decades Latin American gross domestic product could grow at a cumulative annual rate of approximately 7%.9/ According to this growth hypothesis and historical industrialization

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7/ See United Nations, E/C.7/97.

8/ See Mamalakis and ESCAP, E/ESCAP/NR.6/20.

9/ See CEPAL, E/CEPAL/R.237. Normative scenario.

patterns, between 1970 and the year 2000 the mining sector's share will rise from 24.5% to 32.3% and the annual growth rate of industrial gross domestic product should reach approximately 8%.10/ Similarly, it is estimated that the basic metals and engineering subsectors should grow at a rate of 9.5%, which is slightly higher than that projected for expansion of metallic mineral exports in the above-mentioned period.11/ This projection establishes that the mining sector product will grow at a rate similar to that referred to above (9.5%), with the result that its share of overall Latin American product will rise from 4.3% in 1979 to 8.2% in the year 2000 (table 3). If this goal is achieved, and taking into account the fact that mining projects take four to seven years to achieve results, it is necessary to make an immediate and large-scale effort to channel investments towards the mining sector, since otherwise serious obstacles to the process of industrialization and development of the region could arise. Given the scale of the investment in question, the greatest difficulties could occur in the relatively less developed countries, since such investment would represent a high percentage of overall investment and public revenue and would divert resources from more balanced development of the other sectors.

2. Share of exports

17. Only seven products account for close to 60% of the value of Latin American metal output: iron ore 23%, copper 17%, nickel and zinc 5% each, tin 3%, lead 3% and bauxite 2%. Latin American mining potential could permit exploitation of over 50 minerals, thus resulting in the diversification of the production and exportation pattern in accordance with the requirements of the region's future industrialization and of the international markets for minerals. In 1977 the relative shares of metal exports were as follows: iron ore 32%, copper 31%, bauxite 13%, zinc 6%, silver 6%, tin 6%, lead 4%, and nickel 2%. However, this pattern could change quite rapidly, if the differences in growth rates for the period 1970-1977 are maintained. The highest annual growth rates were attained by exported silver, zinc and tin, whereas the lowest expansion rates were those of lead and copper (see tables 4 and 5).

10/ Also see Chenery.

11/ See Leontief.

/Table 3

Table 3

PROSPECTS FOR THE MINING SECTOR UNTIL THE YEAR 2000

(Billions of dollars, at 1970 prices)

	Base year 1970		Projection to the year 2000		Growth rates, 1970-2000
	Gross domestic product	Percentage	Gross domestic product	Percentage	
1. World gross domestic product	3 220.0a/		11 072.0a/		4.2
2. Overall Latin American gross domestic product	154.0a/		1 217.0a/		7.1a/
Share of world gross domestic product (percentage)		4.8b/		11.0b/	-
3. Industrial gross domestic product of Latin America	38.0c/		393.0c/		8.1
Share of the overall Latin American gross domestic product (percentage)		24.5c/		32.3c/	-
4. Engineering gross domestic product of Latin America	7.0b/		107.0b/		9.5
Share of industrial gross domestic product of Latin America (percentage)		18.4a/		27.2a/	-
5. Mining gross domestic product of Latin America	6.6d/		100.0e/		9.5e/
Net metallic mineral exports	3.3a/		49.4a/		9.4
Internal consumption of metals in relation to the engineering gross domestic product of Latin America (percentage)		47.1a/		47.3b/	-
Share of overall gross domestic product of Latin America (percentage)		4.3d/		8.2b/	-

a/ See Carter. CEPAL estimates a rate of 6.2% according to the trends scenario and 5.9% in the moderate acceleration scenario.

b/ Estimates on the basis of footnote e/.

c/ See CEPAL, E/CEPAL/R.237.

d/ Table 1 for the year 1970.

e/ CEPAL estimates a rate of 5.4% in the moderate accelaration scenario.

/Table 4

Table 4

LATIN AMERICA: BREAKDOWN AND GROWTH OF EXPORTED ORES

Product	Exported ores 1977		Annual growth rate, 1970-1977 (current prices)
	Value in millions of dollars	Breakdown by percentage	
Iron ore	1 756.2	31.8	14.0
Copper	1 733.8	31.4	4.3
Bauxite	709.5	12.9	12.3
Tin	352.4	6.4	17.5
Silver	347.3	6.3	23.7
Zinc	319.1	5.8	18.2
Lead	202.1	3.7	10.6
Nickel	91.4	1.7	129.2 a/
Total	5 511.8	100.0	10.8

Source: See table 2 of the statistical annex.

a/ 1971-1977.

/Table 5

Table 5

LATIN AMERICA: CHIEF COUNTRIES EXPORTING ORES, 1977

Product	Countries	Percentages	Subtotal by ore
Iron ore	Brazil	63.7	
	Venezuela	17.3	
	Chile	5.9	86.9
Copper	Chile	76.0	
	Peru	22.0	
	Mexico	1.5	99.5
Bauxite a/	Jamaica	75.8	
	Guyana	18.3	
	Dominican Republic	3.1	97.2
Tin	Bolivia	92.7	
	Brazil	6.3	
	Peru	0.9	99.9
Silver	Mexico	34.6	
	Peru	33.1	
	Dominican Republic	15.9	83.6
Zinc	Peru	44.1	
	Mexico	36.7	
	Bolivia	14.0	94.8
Lead	Peru	62.2	
	Mexico	26.1	
	Bolivia	6.1	94.4
Nickel b/	Dominican Republic	99.6	
	Brazil	0.3	99.9

Source: See table 2 of the statistical annex.

a/ No information available on Suriname.

b/ No information available on Cuba.

/18. Relatively

18. Relatively speaking, mining is one of the most important export areas for a number of countries of the region. If hydrocarbons are excluded, minerals fluctuated from 0.1% of Ecuador's total export volume to 65% of that of Chile. Other countries in which exported minerals are of relatively great importance are: Bolivia, the Dominican Republic, Jamaica, Guyana and Peru (see table 6). The share of exported minerals in relation to overall exports rose in the period 1970-1977 in the cases of Colombia, the Dominican Republic, Honduras and Jamaica. In contrast, their share dropped in the remaining countries, with the exception of Mexico and Peru, whose share remained constant (see once again table 6 and table 4 of the statistical annex).

19. In absolute terms the chief countries exporting ores are Chile and Brazil, with amounts exceeding one billion dollars. Those two countries are followed, in order of importance, by Peru, Jamaica, Bolivia, Mexico and Venezuela, with amounts exceeding US$ 300 million (see table 7).

20. One of the most outstanding characteristics of the region's metal mineral exports is their high level of specialization in one single product. Bauxite and aluminium accounted for 99.7% of exports of the chief metal mineral products of Guyana and Jamaica; iron and steel 97.5% of those of Brazil, 94.1% of those of Argentina and 94.3% of those of Venezuela; copper accounted for 87% of Chile's exports and 92.9% of those of Ecuador, and tin for 78% of those of Bolivia (see table 7). This level of concentration of mineral exports is rising in the cases of Argentina (steel), Bolivia (tin), Colombia (iron ore), the Dominican Republic (iron and nickel), Ecuador (copper), Mexico (silver), and Nicaragua (iron ore), since the rate of growth of these products is greater than that of overall metal mineral exports (see tables 5 and 6 once again). On the other hand, the exports of two or three countries accounted for a high percentage of the region's exports of each product, the share of such exports varying from 83.6% in the case of silver to over 99% in the case of copper, tin and nickel (see table 5 once again).

21. Another of the major characteristics of Latin American mineral exports is their low elasticity in relation to price fluctuations, giving rise to the need to establish regional trade reserves. In the period under consideration elasticity of exported tin, zinc and nickel was below unity, and the rise in the value of those exports was therefore influenced to a greater extent by higher prices than by the increase in the volume exported.

/Table 6

Table 6

LATIN AMERICA: SHARE OF EXPORTED MINERALS a/ IN OVERALL EXPORTS

	Share		Rate of growth of exports, 1970-1977	
	Year	Percentage	Minerals	Percentage
Countries with mining economies				
Bolivia	1977	58.0	15.6	19.3
Chile	1975	64.8	5.1b/	7.8b/
Ecuador	1974	0.1	23.2c/	34.1c/
Guyana	1977	44.4	9.4	10.3
Jamaica	1977	50.0	13.3	10.9
Mexico	1976	5.0	13.1d/	13.3d/
Peru	1977	39.0	8.4	8.7
Dominican Republic	1977	18.6	41.1	19.7
Venezuela	1976	3.4	10.2d/	20.5d/
Countries with semi-mining economies				
Argentina	1977	1.3	14.9	17.5
Brazil	1977	8.8	20.4	23.1
Colombia	1977	0.2	27.3	19.2
Honduras	1977	5.9	19.1	16.0
Nicaragua	1977	1.3	9.3	19.4

Source: See table 4 of the statistical annex.

a/ Calculated on the basis of current prices, including only major metals.

b/ 1968-1975

c/ 1968-1974.

d/ 1969-1976.

/Table 7

Table 7

LATIN AMERICA: CHIEF METALS EXPORTED

(Current prices)

	Minerals exports		Growth rates, 1970-1977	Share of chief product	
	Year	Millions of dollars		Product	Percentage
Argentina	1977	86.3	16.4	Iron ore	94.1
Bolivia	1977	418.7	17.3	Tin	78.0
Brazil	1977	1 147.9	20.5	Iron ore	97.5
Colombia	1977	6.5	37.3	Iron ore	59.7
Chile	1975	1 132.7	4.4a/	Copper	87.0
Ecuador	1974	1.4	81.3b/	Copper	92.9
Guyana	1977	130.2	9.4	Bauxite	99.7
Honduras	1977	32.7	11.3c/	Zinc	39.2
Jamaica	1977	539.1	13.3	Bauxite	99.8
Mexico	1976	348.1	14.8d/	Silver	33.3
Nicaragua	1977	9.9	20.0	Iron ore	40.7
Peru	1977	852.8	4.7	Copper	44.7
Dominican Republic	1977	168.4	136.8e/	Iron and nickel	54.1
Venezuela	1976	344.1	10.0d/	Iron ore	95.3

Source: See table 3 of the statistical annex.

a/ 1968-1975.
b/ 1967-1974.
c/ 1973-1977.
d/ 1969-1976.
e/ 1971-1977.

/In the

In the cases of copper and lead elasticity was negative, but it had a different significance in each case. The price of lead rose by 104% during the period 1970-1977, and the volume exported dropped by 1%, whereas in the case of copper volume rose by 45% while the price dropped by 7% during the same period (see table 8).

22. The United States Department of the Interior 12/ estimates that in the period 1974-2000 world demand for metals will grow at the following cumulative annual rates: aluminium 5.4%, copper 4.4%, lead 3.1%, nickel, steel, zinc and silver between 2.3 and 2.8% and tin 1.6%. In view of the potential of regional reserves it may be anticipated that Latin American exports will grow at rates considerably higher than those mentioned above.

3. Generation of foreign currency and public revenue

23. Although there may be differences in the texture and quality of the ore mined, in international trade the fine content of metal, which does not vary, is taken as a basis. This is why quotations for the various metals are similar in the major marketing centres of the world. On the other hand, it has been estimated that the income elasticity of international demand for metal products is greater than that of agricultural products.13/ In theory, in international trade in minerals these considerations would result in:

(a) A better position on the world market than that of agricultural products - which have to compete from the point of view of quality and prices - and therefore better opportunities for generating foreign currency.

(b) A decrease in requirements regarding external resources and an improvement in the external debt situation.

(c) Improvement in the terms fof trade owing to greater income elasticity of demand for metal products.

24. However, this is not the actual situation; it must be borne in mind that demand for metals is basically a form of demand resulting from the industrial expansion of the developed countries, whose behaviour can cancel out or reduce the relative advantages mentioned above. The following figures give a picture of this situation:

12/ See United States Department of the Interior, 1975.

13/ See Nankani.

/Table 8

Table 8

LATIN AMERICA: PRICE ELASTICITY OF EXPORTED MINERALS, 1970-1977

Product	Variation in the percentage of export volume	Variation in the percentage of prices	Elasticity
1. Aluminium (bauxite)	59	42	1.40
2. Copper	45	-7	-6.42
3. Tin	6	194	0.03
4. Lead	-1	104	-0.01
5. Zinc	61	100	0.61
6. Nickel	10a/	76a/	0.13a/

Source: See tables 2 and 5 of the statistical annex.

a/ 1972-1977.

/(a) The

(a) The share of minerals and metals in international trade was 10% during the period 1972-1974. This percentage fluctuated in subsequent years, with a relatively greater reduction than that in the case of foodstuffs and manufactures (see table 9).

(b) During the period 1968-1976, in the mining economies the coefficient of generation of foreign currency in relation to gross domestic product was greater than in the non-mining economies; however, the relative growth of that coefficient in the latter economies was greater than that of the mining economies during the above-mentioned period (see table 10).

(c) The rate of expansion of the region's external debt was high both in countries with mining economies and in the countries belonging to the second group. Similarly, one of the two countries that managed to reduce their levels of external debt belongs to the one group and the other to the other group, thus proving that mining was not the factor responsible for the decrease in external debt requirements (see table 11).

(d) Nor was there a close relationship in the period 1972-1978 between mining economies and favourable terms of trade, although it is clear that low quotations for copper had an adverse effect on terms of trade in the case of Chile and Peru, while high quotations for tin had a positive effect on the terms of trade for Bolivia (see table 12).

25. Current Latin American legislation generally stipulates that the resources of the subsoil are publicly owned and that rights over them may be conceded to the private sector. In this case the government may, on the one hand, establish norms giving it a substantial share of the income generated by the mining sector and, on the other hand, use the surplus in question in a productive manner. It is therefore extremely important to prepare legislation that, in unstable conditions, permits both encouragement of the investor and achievement of high elasticity of the governments' share in relation to revenue fluctuations. In accordance with these goals, the legislation should fulfil the following basic requirements:14/

(a) The tax to be paid should be foreseeable before invesment in exploration is begun.

14/ See Palmer.

/Table 9

Table 9

BREAKDOWN OF INTERNATIONAL TRADE BY PERCENTAGES a/

	1972	1973	1974	1975	1976
1. Manufactured metal and engineering products	36	34	29	33	33
2. Other manufactures	26	26	24	22	23
3. Hydrocarbons	11	12	21	20	21
4. Food products	17	18	16	16	15
5. Minerals and metals	10	10	10	9	8
Total	100	100	100	100	100

Source: See United Nations, Monthly Bulletin of Statistics.

a/ Calculated on the basis of current prices.

Table 10

COEFFICIENT OF GENERATION OF FOREIGN CURRENCY IN RELATION TO GROSS DOMESTIC PRODUCT

(Percentages)

Developing countries	1968-1970	1971-1973	1974-1976
1. Non-petroleum mining economies	33.4	35.9	35.2
2. Petroleum economies	32.6	27.4	47.5
3. Non-mining economies	17.1	18.1	20.1

Source: See UNDP, DP/430.

/Table 11

Table 11

LATIN AMERICA: EVOLUTION OF EXTERNAL DEBT a/

Countries	Rate of growth of foreign debt 1973-1979	Foreign debt as a percentage of GDP	
		1973	1979
Countries with mining economies			
Bolivia	4.9	37	38
Chile	-2.6b/	36	29
Jamaica	10.4b/	-	-
Mexico	14.9	11	18
Peru	10.9	16	25
Dominican Republic	5.8	20	21
Venezuela	18.7b/	8	15
Countries with semi-mining economies			
Brazil	9.4	14	16
Colombia	-3.2	13	7
Honduras	12.1	19	30
Nicaragua	8.1	32	57

Source: See table 6 of the statistical annex.

a/ 1970 prices were taken as a basis for calculation, in the case of GDP and the unit value index of imported goods, as an external debt deflator.

b/ Period 1973-1978.

/Table 12

Table 12

LATIN AMERICA: TERMS OF TRADE

(Indices, 1970=100)

Countries	1972-1974	1975-1977	1978
Countries with mining economies			
Bolivia	102	115	121
Chile	81	54	49
Ecuador	131	145	142
Guyana	118	126	129
Jamaica	101	123	110
Mexico	107	114	118
Peru	114	100	83
Dominican Republic	100	118	88
Venezuela	190	279	253
Countries with semi-mining economies			
Argentina	132	91	83
Brazil	91	92	88
Colombia	106	136	147
Honduras	97	103	106
Nicaragua	100	102	111

Source: See table 7 of the statistical annex.

/(b) However,

(b) However, tax should be levied on actual income, estimated by calculating probable income, so as to reduce the level of uncertainty both for the public budget and for the investor.

(c) The tax structure should therefore minimize distorsions in the allocation of resources and maintain incentives that encourage efficient administration of projects.

26. There are various tax systems that can be applied to mining, among which the following may be mentioned: royalties on output that could also be at set or variable levels; taxes on the value of exports and taxes on profits. Even although all these systems have an adequate theoretical and legal basis and are relatively easy to administer, taken separately they could hardly meet all the requirements mentioned above, which means that it is necessary to achieve an appropriate combination of the systems in question. In this connexion, an effective system could contain the following elements:

(a) A low ad-valorem tax scale for imports.

(b) An accelerated depreciation scheme, for example, 15 to 20% in the first four years of the project's operation and the rest distributed over the project's life.

(c) Profits after depreciation would be the basis for initial income tax at a rate that could be around 50% of profits.

(d) A system for recovering and repatriating or reinvesting the capital invested within a period of five to ten years. An additional depreciation system could be applied in order to achieve this goal.

(e) Once the capital invested has been recovered a second tax of approximately 50% would be levied on the net flow of funds (financial surplus).

27. According to the figures in table 13, taxation is more onerous in countries with mining economies (17%) than in other countries (15%) During the period 1960-1973 this coefficient was 21 and 17% in the case of Guyana and Jamaica and 8 and 10% in the case of Guatemala and Paraguay, respectively. The figures would appear to show how much easier it is to levy taxes in mining economies, despite the instability of the prices of the products in question.

/Table 13

Table 13

TAX BURDEN a/

(Percentages)

Developing countries	1960-1970	1971-1973
1. Mining economies	16.8	17.0
2. Petroleum economies	19.8	22.8
3. Non-mining economies	13.0	13.5

Latin America	1960-1973
1. Countries with mining economies	
Guyana	21.0
Jamaica	17.5
2. Countries with semi-mining economies	
Colombia	8.1
Guatemala	7.8
Honduras	10.6
Nicaragua	9.0
Panama	11.5
Paraguay	10.0

Source: See UNDP, DP/430.

a/ Total tax revenue in relation to overall GDP.

4. Impact on the development process

28. Assuming that development depends on capital formation and technical progress expressed in terms of labour productivity levels and growth, mining and metallurgical activities constitute one of the sectors that could potentially make a considerable contribution to the region's economic growth.

29. Mining resources are a form of "primary capital formation" that must be transformed into other forms of reproductive capital, a process that consists of the following stages:15/

(a) The securing by the producing country of a substantial share of mining revenue in the form of foreign currency and revenue for the public sector.

(b) Allocation of a considerable part of the surplus in question to formation of domestic saving.

(c) Use of this resource to finance other investment projects.

30. As already mentioned, Latin American mining is generating considerable financial flows in the form of foreign currency and revenue for the public sector, and on the other hand, there is no precise information on the extent to which such resources are used for the purpose of immediate improvement of the quality of life (consumption) or for the future development of countries (saving and investment). The figures in table 14 show that for the developing countries as a whole in the period 1968-1976 the average propensity to save dropped in the countries with mining economies, whereas it rose in the countries with non-mining economies. There are no greater differences in Latin America between the two groups, and the differences in question actually basically occur in the higher-income countries as compared with the lower-income ones. This situation would appear to indicate that the surpluses generated in the mining sector are not being used on a large scale to form other types of capital.

31. In view of their high capital requirements per worker and their potential for increasing the capacity to absorb investment in keeping with the potential of reserves, mining and metallurgical activities could become one of the most dynamic sectors of the region's economy. During the 1960s and 1970s their productivity was 10 to 20 times higher than average productivity in Ecuador, Honduras, the Dominican Republic, and Venezuela,

15/ See Mamalakis.

/Table 14

Table 14

AVERAGE PROPENSITY TO SAVE

(Percentages)

Developing countries	1968	1970	1976
1. Mining economies	17.6	14.8	14.9
2. Non-mining economies	13.5	15.2	16.2

Latin America	1976-1978
1. Countries with mining economies	
Bolivia	11
Chile	18
Ecuador	16
Guyana	17
Mexico	20
Peru	13
Dominican Republic	21
Venezuela	22
2. Countries with semi-mining economies	
Argentina	24
Brazil	25
Colombia	21
Honduras	13
Nicaragua	16

Sources: See UNDP, DP/430 and table 8 of the statistical annex.

/and 2

and 2 to 5 times in the cases of Argentina, Bolivia, Chile and Peru. In turn, the rate of growth was higher than that of average productivity in all cases, with the exception of Bolivia, Mexico and Nicaragua (see table 15). According to studies conducted, the productivity of mining projects basically depends on the following factors:

(a) The scale of the mining, which is associated with improved technological levels of production. For example, in Peru the four major mining enterprises generate two thirds of the product of the sector in question and employ only one third of its labour.16/

(b) The type of mining operation, since it is generally possible to mine a greater volume of mineral per worker at open-face mines than in the case of mining in shafts and galleries in the subsoil or by suction of marine nodules.17/

(c) The fine metal content of the ore or efficiency of processing.

(d) The grade or standard of metallurgical recovery, which depends on the quality of the ore and on the technology used in the process in question.

32. From the colonial era to the early decades of this century the mining sector's high productivity resulted in the existence of a dual or enclave economy in a number of countries of the region. Although in recent years an endeavour has been made to diversify such economies in an attempt to achieve more balanced growth, the high productivity of the mining sector and other modern subsectors continues to make the pattern of production uneven.18/ This situation may be observed in figure 1, in which the group of Latin American countries with mining economies displays a more uneven pattern than that displayed by the group of countries with semi-mining economies. In the former group 40% of the labour force, which is concentrated in the less productive sectors, accounts for approximately 11% of the total product, whereas in the more productive sectors 6% of the labour force contributes over 36% of the product. In the latter group 40 and

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16/ See United Nations, E/C.7/97.

17/ Ibid.

18/ See Cosulich.

/Table 15

Table 15

LATIN AMERICA: EVOLUTION OF MINING AND OVERALL PRODUCTIVITY[a]

(Percentages)

	Period	Growth rate		Ratio between mining productivity and overall productivity, index [b]
		Mining productivity	Overall Productivity	
Countries with mining economies				
Bolivia	1960-1976	1.1	3.3	184
Chile	1960-1970	6.2	3.1	371
Ecuador	1962-1974	17.8	3.9	1 941
Mexico	1960-1970	3.6[c]	4.5	126
Peru	1961-1972	5.4	2.6	472
Dominican Republic	1960-1970	13.4	1.4	1 888
Venezuela	1961-1971	3.2	2.8	1 063
Countries with semi-mining economies				
Argentina	1960-1970	8.6	2.5	392
Brazil	1960-1970	8.9	3.4	106
Colombia	1951-1964	2.2	2.3	152
Honduras	1961-1974	8.7	2.0	1 161
Nicaragua	1963-1971	-0.5	4.6	100

Source: See table 9 of the statistical annex.

a/ Gross domestic product per person employed.

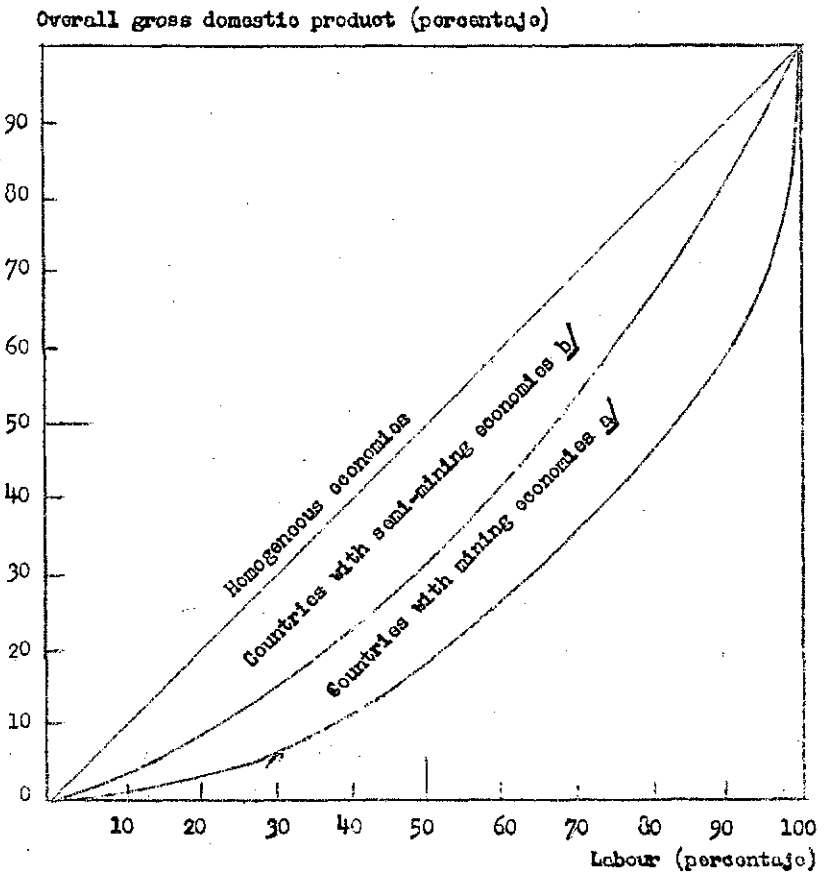
b/ Overall productivity of each country (in the last year indicated) = 100.

c/ Including industry.

Figure 1

LATIN AMERICA : DISTRIBUTION OF PRODUCTIVITY

(Primary distribution of income)



Source: See table 9 of the statistical annex.

a/ Bolivia, Chile, the Dominican Republic, Ecuador, Mexico, Peru and Venezuela.

b/ Argentina, Brazil, Colombia, Honduras and Nicaragua.

/6% of

6% of the labour force contribute 23 and 12% of the product, respectively. The above situation means that expansion of mining activities and of other highly productive subsectors calls simultaneously for systematic action to raise the productivity of the most backward sectors and subsectors.

33. There are, in addition to productivity differences, other reasons, why the wages of mining workers are higher than average and industrial wages, including the harsh working conditions, particularly within mines, the remoteness and often the inhospitable environment of mining centres and the effectiveness and negotiating power of miners' unions.19/ 20/ However, the salary differential is not in proportion to the difference in productivity as compared with other sectors (see table 16), which could mean that a substantial proportion of the mining surplus goes to entrepreneurs and the State and is used by them in the form of consumption.

34. In a number of countries the mining sector employs a high proportion of unskilled labour. This fact, together with the wage differentials, attracts redundant labour in other sectors, particularly the agricultural sector, and the social cost of the transfer in question is close to zero,21/ thus placing the mining sector in an advantageous position in relation to other sectors with higher training, installation and adaptation costs. However, owing to its high capital requirements per worker, large-scale mining has little capacity to generate new employment directly. During the 1970s the percentage of the economically active population employed in the mining sector varied from 0.1% in the Dominican Republic to 3.9% in Bolivia, and in the period 1960-1972 in a number of countries, such as Chile, the Dominican Republic, Nicaragua, Peru and Venezuela, there was even a displacement of labour from the mining sector to other sectors (see table 17). Even although medium and small-scale mining have a greater capacity to absorb labour, it must be borne in mind that the drop in productivity may be proportionately greater. It is therefore necessary, for the purposes of planning in the mining sector, to strike a proper

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19/ See United Nations, E/C.7/97.

20/ See Nankani.

21/ Ibid.

/Table 16

Table 16

LATIN AMERICA: MINING SECTOR WAGES, 1970-1975

(Coefficients)

	Ratio between per capita mining GDP and overall per capita GDP	Ratio between industrial and mining wages and overall per capita GDP	Ratio between mining wages and overall per capita GDP
Countries with mining economies			
Bolivia	1.84	0.93	0.95
Chile	3.71	0.45	0.80
Ecuador	19.41	1.77	-
Jamaica	-	-	1.60
Peru	4.72	1.84	-
Dominican Republic	18.88	1.30	-
Venezuela	10.63	1.67	3.82
Countries with semi-mining economies			
Argentina	3.92	0.90	-
Colombia	1.52	1.50	-
Nicaragua	1.00	1.90	-
Panama	-	1.50	-

Sources: See UNDP, DP/430, and table 15.

/Table 17

Table 17

LATIN AMERICA: DIRECT EMPLOYMENT OF LABOUR IN MINING ACTIVITIES a/

(Percentages)

	Period	First year of the period	Final year of the period	Rate of growth of employment in labour
Countries with mining economies				
Bolivia	1960-1976	3.3	3.9	0.8
Chile	1960-1970	4.0	3.2	-1.1
Ecuador	1962-1974	0.3	0.4	5.7
Mexico	1960-1970	17.2b/	21.8	4.8
Peru	1961-1972	2.3	1.5	-1.9
Dominican Republic	1960-1970	0.3	0.1	-8.2
Venezuela	1961-1971	2.6	1.7	-1.3
Countries with semi-mining economies				
Argentina	1960-1970	0.6	0.5	0.6
Brazil	1960-1970	0.8	0.8	2.6
Colombia	1951-1974	1.7	1.6	2.2
Honduras	1961-1974	0.3	0.3	1.9
Nicaragua	1963-1971	0.9	0.6	-3.9

Source: See table 9 of the statistical annex.

a/ As a percentage of the overall economically active population.

b/ Including industry.

/balance among

balance among the growth rate of the product of that sector, higher labour productivity, and levels of employment. At the same time, account should be taken of the fact that the mining sector could generate more indirect employment than other sectors, since many of the new mining production centres could be located in areas far from urban centres that will therefore call for new economic, physical and social infrastructure works.22/

35. In view of the fact that a great part of Latin American mining output is destined for export there is an indirect transfer of resources to other sectors at times when local currencies are overvalued, and the mining sector receives resources when such currencies are undervalued. In this connexion, in some cases exchange rate fluctuations could give an impetus to mining activities or redistribute the mining sector's nominal surplus to the rest of the economy.

36. However, it should be borne in mind that an undervalued currency can exert considerable inflationary pressures, since the level of the prices of imports rises in the national currency. In the case of mining economies such pressures could be exacerbated by a marked drop in metal prices since, on the one hand, there would be a drop in government revenue and government spending would have to be maintained with the aid of credits from the central bank, and, on the other hand, foreign currency would become less readily available, thus causing a contraction in imports and, consequently, in overall supply. Currently, inflationary pressures are caused by a series of factors affecting both mining and non-mining economies, which means that this phenomenon cannot be attributed solely to fluctuations in the prices of metal products; it is for this reason that, taking the developing countries as a whole, in the period 1970-1976 the rate of growth of inflation was higher in non-mining economies than in mining economies. In Latin America the higher rates of inflation of 1978 were recorded both in countries with semi-mining economies (Argentina 170% and Brazil 38%) and in countries with mining economies (Peru 74% and Jamaica 48%) (see table 18).

37. In view of the foregoing, it could be concluded that a number of countries of the region can base their development and industrialization

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22/ See United Nations, E/C.7/97.

/Table 18

Table 18

ANNUAL INFLATION RATES

(Percentages)

	1960-1970	1970-1976
Mining economies	8.3	12.2
Non-mining economies	5.5	13.6
	1970	1978
Countries with mining economies		
Bolivia	3.8	13.5
Chile	34.9	30.3
Ecuador	8.0	11.7
Guyana	2.4	20.0
Jamaica	7.5	48.4
Mexico	7.8	16.2
Peru	5.7	73.7
Dominican Republic	-1.3	1.8
Venezuela	3.4	7.0
Countries with semi-mining economies		
Argentina	21.6	169.8
Brazil	17.7	38.1
Colombia	3.5	17.8
Honduras	1.4	5.2
Nicaragua	1.9	4.4
Total Latin America	12.2	30.9

Source: See UNDP, DP/430.

/strategy on

strategy on stepped-up expansion of mining and metallurgical output and that in that case the State could play a more important role in transforming such economies. In other countries, whose chief development options are not in the area of mining and engineering production, expansion of the mining and engineering sector could, in any event, be a strategic or dynamic factor in the process in question. However, as already pointed out, development of mineral resources is a complex process calling for systematic action in the long term. Such action could be systematized in the form of plans that could take into consideration the following stages:

(a) Establishment of long-term development policy with regard to mining and industry.

(b) Planning of long and medium-term investment in mining and metallurgy.

(c) Programming of utilization of the surplus generated by mining, which could be used to finance new investment projects that could be connected with mining as follows:

(i) Investment in infrastructure to reduce mining production and marketing costs.

(ii) Vertical integration of the production process through the establishment of industries to provide mining with inputs and of industries to process the output of metals.

(iii) Regional development of areas that have an influence on mining and metallurgical activities.

(iv) Projects that permit internal retention of the multiplier effects of investment in mining.

(d) A policy of change in accordance with the goals of promoting mining production or of distributing the mining surplus.

(e) A wage policy in accordance with objectives relating to employment of labour or productivity increases.23/

23/ Ibid.

II. IMPORTANCE OF LATIN AMERICA WITH REGARD TO WORLD MINERAL RESOURCES AND TRADE IN MINERALS

38. A great part of the highest-quality deposits are located in developing countries, and Latin America is no exception in this respect, since, taken as a whole, it has approximately one-third of known mining reserves. On the other hand, the other basic inputs, capital and technology, as well as the chief centres of consumption, are concentrated in the developed countries. In accordance with this distribution of factors, an international division of labour has been established whereby the developing countries have generally focused their activities on the mining, processing, founding, refining and exportation of ores, while importing metal and engineering products at levels that, in the case of Latin America, represent approximately 40% of their total imports.

39. If mining resources are considered as a factor of production separately from capital and technology, it may be seen that there is a sufficient theoretic basis for concluding that the developing countries that have such resources should specialize solely in exporting raw material, in view of the constraints on availability of capital and technology and the small scale of their domestic markets. However, unlike agricultural production, in which the major complementary factors are land and unskilled labour, the exploitation of mineral resources needs to be complemented to a great extent by capital and technology, which are requirements that result in a high intensity of the factor in question per worker at all stages of the production process, including those of prospection and exploration for minerals. In view of this situation, the theories put forward do not appear to provide an adequate basis for establishing which countries should specialize in mining and industrial production - those with the raw materials, or those that have greater resources in terms of capital, technology and consumer markets. The following arguments may be used in favour of the first criterion:

(a) The income elasticity of metal products is increasing in the developing countries, whereas per capita consumption in the more developed countries displays very low growth rates, with the result that there will be a gradual transfer of the centres of consumption to the current developing areas.

/(b) In

(b) In the long term the relative availability of the factors of production will change, with the result that the pattern of agricultural exportation will change into a system of industrial exportation that will have to compete closely with that of the countries that are already industrialized, whereas the mining and industrial economies that have sufficient reserves will be able to maintain their comparative advantages.

(c) Transport costs for only the finished products will be lower than those for the current transport of raw materials and finished products.

(d) The least mobile factor is the unskilled labour required for maintaining the levels of mining and industrial operation costs, in contrast with a greater degree of mobility of capital.

40. Although the integration of mining and industrial activities that has frequently taken place as a result of action on the part of the transnational corporations, which are involved at the various stages of production and marketing, could be an important factor in the development of resources, it is not desirable for a substantial portion of the surplus generated in the process in question to be concentrated in the hands of such corporations.

41. The factors described above are giving rise to situations that could result in a change in the current focus of international trade in the products in question. On the one hand, the developing countries are gradually participating in the various stages of the production and marketing process, chiefly with a view to obtaining a greater proportion of the revenue from mining. On the other hand, the developed countries are moving towards a higher level of self-sufficiency in raw materials through:

(a) Concentration of investment in prospection and exploration in their own territories;

(b) Production of substitutes and secondary metal from scrap metal;

(c) Establishment of strategic stocks;

(d) Exploration for marine minerals.

42. Latin America has major comparative advantages over the other regions for the following reasons, which will be considered in the remainder of this chapter:

(a) It is a region with extensive, comparatively high-grade mineral resources, many of which have yet to be explored or exploited;

/(b) It

(b) It is undergoing a rapid industrialization process calling for large quantities of engineering products; and

(c) It has production patterns that are largely geared towards exporting.

1. The importance of Latin American reserves with regard to world mineral resources

43. Mineral resources are subject to constant appraisal in accordance with the level of knowledge there is of the size of deposits and with the economic value of such deposits, which in turn depends directly on the international prices quoted for metals and, conversely, on production and marketing costs. At the same time, it must be borne in mind that such resources are not constituted only by primary ores located in land-based deposits and in the form of marine nodules, but also by secondary metals that can be obtained from waste material (scrap). The difficulties involved in interpreting and evaluating information on mineral resources and the need for common classification criteria prompted the United Nations Economic and Social Council to adopt, in March 1979, a proposal concerning the international classification of mineral resources, prepared by a group of experts on definitions and terminology relating to such resources and which permits the following classification of resources:

Category R-1 covers resources in situ in deposits that have undergone sufficiently detailed surveys to establish their formation, dimensions and basic characteristics so that they may be mined and processed under optimum conditions, as well as the distribution of the mineral in the deposit, its grade, physical properties, minerological characteristics and harmful components. All these characteristics are determined chiefly by means of direct physical work (wells, galleries, shafts, etc.), using extrapolation of geological, geophysical and geochemical data to a limited extent.

Quantities have been calculated with a relatively high degree of accuracy, although estimation errors could be as high as 50% in a number of deposits. Such estimates are suitable for planning mining activities.

Category R-1 may be equated with a number of the most common terms used currently for classifying resources.

R-1 = Proven, certain, demonstrated, identified, located, explored, etc.

Category R-2 covers estimates of resources in situ that are directly connected with discovered deposits; however, unlike in the case of category R-1, estimates are provisional and essentially based on general geological information corroborated by direct measurements at a number of points. Dimensions and form are inferred by analogy with neighbouring deposits falling within category R-1, on the basis of general geology and structural considerations, and through analysis of direct and indirect indications of the presence of mineral deposits. Figures arrived at in this category are less definite than those in category R-1; estimation errors may be over 50%. The estimates in category R-2 are mainly suitable for planning new exploration activities, with a view to future reclassification in category R-1.

Category R-2 may be compared with the current classifications that distinguish between probable, inferred, semi-proven, etc.

Category R-3 corresponds to resources that have yet to be discovered but are thought to exist in common deposits that may be discovered. Estimates of in situ quantities are made chiefly on the basis of geological extrapolations or geophysical or geochemical indications, or by statistical analogy. The existence and size of all deposits in this category are necessarily speculative. Such deposits may or may not actually be discovered in the coming decades. The estimates falling within this category indicate what opportunities there are in the field of exploration, as well as long-term prospects regarding the supply of raw materials. Information on resources in category R-3 should be provided in the form of a range of figures so as to reflect their low level of accuracy.

This category may be compared with current classifications distinguishing between possible potential, not discovered, hypothetical, projected, etc.

Any other material of lower economic potential should be referred to as a "formation" and be accompanied by an explanation of the basis and significance of the estimates.

Categories R-1 and R-2, in particular, may be subdivided as follows:

E = In situ resources regarded as exploitable in a given country or region under the prevailing socio-economic conditions and with available technologies.

/S =

S = The remaining in situ resources that are not regarded as being of current interest but that could become so owing to foreseeable economic and technological changes.

Subcategory S may be further subdivided to obtain an estimate of marginal resources "M" that could be exploited in the more mediate future as a result of normal or anticipated changes in economic or technical circumstances.

All the categories and subcategories described concern estimates of the in situ quantity of metals or minerals. It is considered important also to specify the recuperable quantity of a mineral or metal. Such quantities express with greater accuracy the volume that may be reflected in the supply of minerals. It is therefore recommended that a parallel series of categories and definitions of recuperable quantities should be established, in addition to the categories and subcategories already mentioned. This would permit utilization of one series or of both series in conjunction with each other, as appropriate. It is proposed that the symbols r-1, r-2 and r-3 should be used for recuperable quantities. The letters E, S and M could be used in both cases for the subcategories. However, there can be no general definition of "recuperability" nor of the point in the mining and treatment process at which the level of "recuperability" is to be assessed. Such questions must be settled individually in the case of each product.

If the proposed classification system comes to be used extensively for international communication of information on mineral resources, merely the first step towards general harmonization of the classification of such resources will have been taken. The work of collecting, aggregating and disseminating estimates on resources at the international level is a task that is currently carried out by only a few specialized agencies in the developed countries, the International Atomic Energy Agency, in the case of uranium, and the World Energy Conference, in the case of other sources of energy.

Lastly, it should be stressed that the proposed classification should be adjusted to the individual requirements of the various mineral products. For example, it is perhaps necessary to establish higher levels of accuracy than those already mentioned (R-1, R-2, R-3, etc.).

/44. The

44. The inventory of proven and probable reserves in Latin America shows that there are considerable resources, in terms of both metallic and non-metallic minerals. The most important deposits in the former group are iron ore, bauxite, copper, manganese, rutile and nickel. In the latter group the most extensive deposits are of phosphate rock, nitrates, sulphur and borax. The resources in question are largely concentrated along the zone adjacent to the Cordillera of the Andes and in Brazil, Mexico and the Caribbean (see table 19).

45. However, the common denominator of the countries of the region is the need for greater knowledge of their mineral resources in order to be able to exploit them. For example, it is pointed out in that connexion that exploration activities cover only 5% of Mexico's potential mining area 24/ and 10% of that of Bolivia.25/ Assessment of potential reserves would establish whether there are extensive deposits of copper, bauxite, iron ore, tin, silver, zinc, lead, manganese and nickel. Such resources would be concentrated chiefly in Brazil (iron ore, tin, manganese and zinc), Chile (copper), Cuba (nickel), and Mexico (silver and lead) (see table 20).

46. In recent years most countries have started new geological survey programmes and have completed preparation of their national geological maps (scales 1:5 000 000 and 1:1 000 000). Countries such as Argentina, Brazil, Chile, Colombia, Ecuador, Mexico, Peru and Venezuela and the countries of Central America are conducting activities to locate and identify mineral deposits and have embarked on preparation of the corresponding metalogenic maps.26/ In the case of Bolivia, this work has been completed for the Andean area corresponding to the Nazca plate.27/ Analysis of these maps permits the following conclusions of a very general nature to be drawn.

(a) Mexico would appear to have great mining potential, and it is considered that in order to gain precise knowledge of this the exploration work should be continued at the semi-detailed and detailed level over an area of more than 1.5 million km2.

24/ See Salas.

25/ See Bolivian Ministry for Planning and Co-ordination, 1978.

26/ See Salas.

27/ See Claure Velasco et al.

/Table 19

Table 19

LATIN AMERICA: PROVEN AND PROBABLE RESERVES OF METALLIC ORES, 1978 ($R_1 + R_2$)

(Thousands of tons of metal content)

Product	Total reserve	Share in percentages by subregions				Countries with greatests reserves	
		Group 1 a/	Group 2 b/	Group 3 c/	Group 4 d/	Country	Percentage
Antimony	648	66	-	34	-	Bolivia	56
Bauxite	6 026 500e/	-	42	1	57	Brazil	42
Bismuth	24	79	-	21	-	Bolivia	79
Cadmium	14	-	-	100	-	Mexico	100
Copper	189 445	76	-	20	4	Chile	57
Columbium	8 165	-	100	-	-	Brazil	100
Chromium	1 390	-	86	-	14	Brazil	86
Tin	1 587	62	38	-	-	Bolivia	62
Iron ore	53 772 700e/	51	30	1	18	Bolivia	48
Iridium	2	-	100	-	-	Brazil	100
Lithium	1 270	100	-	-	-	Chile	100
Manganese	61 319	33	65	1	1	Brazil	65
Mercury	9	-	-	100	-	Mexico	100
Molybdenum	2 806	96	-	3	-	Chile	88
Nickel	23 879	3	2	-	95	Cuba	67
Silver	49	39	-	61	-	Mexico	61
Platinum	31f/	100	-	-	-	Colombia	100
Lead	11 484	35	21	43	1	Mexico	43
Rhenium	1 360	100	-	-	-	Chile	87
Rutile	55 100	-	100	-	-	Brazil	100
Selenium	57	91	-	9	-	Chile	68
Tantalium	3	-	100	-	-	Brazil	100
Tellurium	3	100	-	-	-	Peru	100
Thorium	54	-	100	-	-	Brazil	100
Tungstun	77	51	23	26	-	Bolivia	51
Uranium	236	5	-	95	-	Mexico	95
Vanadium	136	100	-	-	-	Chile	100
Zinc	15 536	45	29	26	-	Peru	45

Source: See table 11 of the statistical annex.

a/ Argentina, Bolivia, Colombia, Chile, Ecuador, Peru and Venezuela.

b/ Brazil, Paraguay and Uruguay.

c/ Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua and Panama.

d/ Bahamas, Barbados, Cuba, Grenada, Guyana, Haiti, Jamaica, Dominican Republic, Suriname and Trinidad and Tobago.

e/ In terms of unprocessed ore.

f/ Tons.

/Table 20

Table 20

LATIN AMERICA: POTENTIAL MINERAL RESERVES (R_3), 1976

(Thousands of tons of metal content)

Country	Copper	Thin	Manganese	Nickel	Silver	Lead	Zinc
Argentina	-	7	-	-	-	-	-
Bolivia	-	1 750	3 283	-	-	-	-
Brazil	-	3 748	17 074	-	-	-	3 226
Colombia	-	-	-	50	-	-	-
Chile	111 220	-	-	-	-	-	-
Cuba	-	-	-	1 645	-	-	-
Guatemala	-	-	-	90	-	-	-
Mexico	-	48	8 274	-	83	5 000	1 482
Peru	34 220	-	-	-	37	4 000	2 267
Dominican Republic	-	-	-	10	-	-	-
Other countries	85 560	-	-	226	19	3 000	3 489
Total potential reserves	231 000	5 553	28 631	2 021	139	12 000	10 464
Total proven and probable reserves	189 445	1 587	61 319	23 879	49	11 484	15 536
Total reserves	420 445	7 140	89 950	25 900	188	23 484	26 000

Source: United States Department of the Interior, Bureau of Mines, Mineral Facts and Problems, Washington, 1976, and table 19.

/(b) The

(b) The majority of the Central American countries have a geological makeup displaying conditions similar to those of the volcanic formation of the Sierra Madre in Mexico: a potential which has not been fully explored. It is also possible that some countries may have geological characteristics similar to those of the cupriferous district of Panama.

(c) The geological studies of Argentina, Bolivia, Chile, Colombia, Ecuador, Peru and Venezuela point to great mining potential in the Andean subregion, which should consequently be explored, especially with a view to diversifying the mining production of these countries.

(d) The territory between the mouths of the rivers Orinoco and Amazon could prove to be a mining area of great importance once suitable means of access to the interior of the jungle have been established and the corresponding geological and mining studies have been made.

(e) The territorial area and the geological and mineral characteristics of Brazil make possible the use of indirect exploration methods, which are being successfully used in the projects RADAM-Brazil and I-100.

(f) The geological and mining studies made in Argentina appear to indicate considerable possibilities of increasing its mining production, to which end exploration should be concentrated mainly on the Andean region from the province of Jujuy to the province of Neuquén.

(g) The eastern part of the territory of Paraguay displays geological characteristics pointing to the existence of deposits of iron ore and other minerals, which should be confirmed by geophysical and geochemical explorations.

47. To sum up, it may be said that the proven and probable reserves of various minerals (R1, R2) in the region are sufficient not only to cover its needs for the next hundred years (on the basis of past demand), but also to maintain the expansion of its exports of rhenium, uranium, lithium, bauxite, colombium, iron ore, nickel, molybdenum, selenium and tellurium. In constrast, it will be necessary to find new reserves in the case of another group of minerals which could be exhausted in a period of less than 30 years. These minerals include chromium, platinum, silver, tungsten, zinc, antimony, bismuth, cadmium, tantalum and thorium (see table 22). Initial investigations on potential reserves (R3) give grounds for assuming that in the long term the region could play a more important role in the production of minerals.

/48. In

48. In the period 1976-1978, Latin America's reserves represented 37% of world reserves of copper, 36% of bauxite, 24% of iron ore, 18% of molybdenum, and 16% of tin. If we consider the potential resources (R3) of the world and of Latin America, these percentages could rise to 19% for tin, 25% for iron ore, 21% for nickel and 10% for zinc. The region's share would go down, however, in the case of bauxite (35%), copper (31%) and lead (8%). The mineral resources (R1 and R2) of the developing countries as a whole constituted 73% of world reserves of tin, 70% of those of bauxite, 55% of the reserves of copper and nickel, and 44% of those of iron ore. The biggest share of the developed market economy countries in world reserves of minerals corresponded to lead, and, in decreasing order of importance, to molybdenum, chromium and platinum, and zinc. The centrally planned economies, for their part, had the biggest shares in reserves of tungsten, manganese and mercury (see table 21).

49. For the group of the 14 main metals, world reserves (including those of Latin America) are not likely to be sufficient to cover the demand of the next 30 years (projected at a growth rate similar to that of the period 1947-1974), except in the case of chromium, iron ore and manganese, which would last somewhat longer before running out. Taking into account the fact that mining projects usually have lead times of seven to ten years, and that an investment is generally considered to be justified when the reserves guarantee 20 to 30 years of life for the project, then the following metals would have critical exhaustion periods: zinc (15 years), silver and mercury (17 years), tungsten (23 years) and copper and platinum (27 years). If the projected rates of production in Latin America are maintained, the metals with critical exhaustion periods in the region would be chromium (4 years), platinum (14 years), tungsten (18 years), silver (20 years) and zinc (25 years). The Latin American exhaustion periods would be longer than those for the world as a whole, however, in the case of bauxite, copper, tin, iron ore, mercury, molybdenum and nickel. In analysing this exhaustion period it is necessary to take into account also the possibilities presented by the potential resources (R3), which, once proven, would increase the total resources of various metals (see tables 21 and 22). These increases would be proportionately greater in the case of Latin American reserves than in those of the world as a whole for tin, iron ore, nickel and zinc.

/Table 21

Table 21

LATIN AMERICA: RELATIVE IMPORTANCE OF PROVEN AND PROBABLE MINERAL RESERVES, 1976-1978

(Percentages)

Product	Developed market economies	Centrally planned economies	Developing economies	Latin America (R_1+R_2)	Percentage share of Latin America	
					Potential reserves (R_3)	Total reserves ($R_1+R_2+R_3$)
Bauxite	27	3	70	36	32	34
Copper	35	10	55	37	17	31
Chromium	54	35	11	1	-	-
Tin	8	19	73	16	21	19
Iron ore	32	24	44	24	28	25
Manganese	36	42	22	2	2	2
Mercury	38	40	22	1	-	-
Molybdenum	63	18	19	18	-	-
Nickel	40	5	55	13	32	21
Platinum	54	45	1	1	-	-
Lead	68	9	23	9	7	8
Tungsten	31	49	20	9	-	-
Zinc	50	27	23	9	10	10

Source: See Leontief and Mikesell and tables 19 and 20 of the text of this document.

/Table 22

Table 22

EXHAUSTION OF PROVEN AND PROBABLE RESERVES, 1978

Product	At the world level			Latin America		Other products c/	
	Growth rate of demand		Year of exhaustion	Growth rate of projected production 1980-2000 b/	Year of exhaustion	Mineral	Year of exhaustion
	Historical 1947-1974	Projected 1980-2000 a/					
Bauxite	9.8	10	2013	3.2	2350	Antimony	1977
Copper	4.8	5	2007	8.8	2047	Bismuth	1985
Chromium	5.3	5	2034	5.0	1984	Cadmium	1983
Tin	2.7	2	2011	1.9	2043	Columbium	2278
Iron ore	7.0	5	2026	7.8	2270	Iridium	2018
Manganese	6.5	5	2028	5.0	2026	Lithium	12272
Mercury	2.0	2	1997	2.0	2174	Rhenium	597148
Molybdenum	7.3	5	2011	5.0	2210	Rutile	2210
Nickel	6.9	5	2010	6.5	2250	Selenium	2199
Silver	2.2	2	1997	2.0	2000	Tantalum	1999
Platinum	9.7	10	2007	10.0	1994	Tellurium	2089
Lead	3.8	2	2011	2.1	2016	Thorium	2004
Tungsten	3.8	5	2003	5.0	1998	Uranium	4562
Zinc	4.7	5	1995	2.4 d/	2005	Vanadium	2049

a/ See Mikesell.

b/ See Leontief, table 14 of the statistical annex and tables 26 and 27 of the text.

c/ Projected at a rate of 10%.

d/ Rate adjusted in accordance with consumption of refined products. See tables 19, 23 and 26 of the text.

/50. The

50. The various results given by the metal reserve balances for Latin America permit the following lines to be sketched for a possible regional policy of investments in mining prospection and exploration (see table 22).

(a) Chromium, platinum and tungsten: it might be desirable to give priority to mining prospection and exploration work in view of the critical exhaustion periods of the proven and probable resources. A similar policy should be followed, for the same reason, in the cases of antimony, bismuth and cadmium, tantalum and thorium.

(b) Tin and nickel: possible increase in exports and exploration work, taking into account the exhaustion periods at the world level and the relatively large size of the proven, probable and potential resources of Latin America.

(c) Copper and bauxite: possible increase of exports and of prospection work, in view of the longer exhaustion periods of Latin America's proven and probable reserves compared with world reserves and the possible decrease of the region's share in potential reserves (see table 21).

(d) Manganese, lead, silver and zinc: possible increase in exploration work in view of the possibilities of probable and proven resources (see table 19) and the critical exhaustion periods for silver and zinc at both the regional and world levels.

(e) Iron, colombium, lithium, rutile, rhenium, selenium, tellurium and uranium: possible increase in exports, in view of the size of the resources compared with the rate of expansion of regional demand.

(f) Mercury, molybdenum: increase in exports and in mining prospection and exploration works, in view of the short exhaustion period at the world level.

2. Geographical distribution of world production and consumption of the main minerals

51. Generally speaking, mining and metallurgical activity in Latin America is directed towards the international market, since except in the case of lead domestic consumption does not exceed 30% of production, while in the case of cadmium and bauxite it is as little as 7%. Total exports range from 66% of the production of lead to 136% of the production of tin. Imports, for their part, vary between 1% for bauxite to 63% for tin. In absolute terms, the biggest volumes of production and exports correspond to iron ore (74 and 54

/million metric

million metric tons of metal content), bauxite (8.5 and 8.1 million), copper (1.5 and 1.3 million), manganese (1.3 million), zinc (1.0 and 0.9 million), lead (0.5 and 0.3 million) (see table 23).

52. The value of the extraction of minerals in Latin America increased from US$ 1 400 million to US$ 3 800 million in 1970 dollars over the period 1950 to 1977 (see table 12 of the statistical annex), with an annual growth rate of 3.8%. At the level of individual products, the biggest growth rates over this whole period were achieved by sulphur, iron ore, nickel and manganese, while the lowest rates corresponded to gold and nitrates (-3.8% and -3.9%, respectively). This growth was not regular over the whole period, however: on the contrary, generally speaking there were high rates in the subperiod 1950-1960, going down in subsequent periods. The different growth rates at the product level have meant that the structure of the value of production has concentrated even more on copper, iron ore, zinc, bauxite, nickel, tin and lead, which increased their share from 74% to 90% over the period 1950-1977. If five more products are added to these, the resulting group of 12 products represented nearly 98% of the value of mining production in 1977 (see table 24).

53. The value of world production of the mineral extraction sector in 1976 was around US$ 57 billion, of which 68% was contributed by the following metals: iron ore (23%), copper (17%), gold (9%), nickel (5%), zinc (5%), tin (3%), and lead, silver and bauxite (2% each). The other metals represented 6% of the value given above, while non-metallic minerals accounted for 26%, the main among them being phosphate rock (5%), potash (4%), nitrates (4%), asbestos (3%) and sulphur (2%). The biggest contribution corresponded to the developed market economy countries (50%), while 25% corresponded to the centrally planned economies and the remaining 25% to the developing countries, among which Latin America's share was over 10%.28/ At the country level, 57.8% of the total value of production was accounted for by the USSR, the United States, Canada, South Africa and Australia. They were followed in order of importance by seven developing countries which contributed 17% of this value, among them Chile, Peru, Brazil and Mexico (see table 25).

28/ See United Nations, E/C.7/97.

/Table 23

Table 23

LATIN AMERICA: MINING SUPPLY AND DEMAND, AVERAGE 1976-1978

(Tons of metal content)

Product	Production	Apparent consumption	Imports	Exports	Other products		
					Mineral	Production	Imports
Bauxite a/	8 502 549	460 000	57 451	8 100 000	Antimony	17 000	2 623
Cadmium	2 000	145	176	2 031	Bismuth	2 160	52
Copper	1 492 000	381 000	235 594	1 346 594	Columbium	12 000	-
Tin	37 946	10 400	23 773	51 319	Chromium	336 000	97 728
Iron ore	73 580 012	21 353 000	1 672 988	53 900 000	Iridium	23	-
Nickel	66 000	11 100	8 824	63 724	Lithium	54	-
Lead	492 000	213 000	46 362	325 362	Manganese	1 345 000	158 041
Zinc	1 007 000	246 500	158 983	919 483	Mercury	73	298
					Molybdenum	12 384	2 201
	Percentage breakdown				Platinum	1	49
Bauxite	100	6	1	95	Silver	3 739	296
Cadmium	100	7	9	102	Rhenium	1	-
Copper	100	26	16	90	Ruthenium	105 000	-
Tin	100	27	63	136	Selenium	114	16
Iron ore	100	29	2	73	Tantalum	68	-
Nickel	100	17	13	96	Tellurium	12	-
Lead	100	43	9	66	Thorium	1 000	-
Zinc	100	24	16	92	Tungsten	4 443	37
					Uranium	40	165
					Vanadium	861	581

Source: See tables 11 and 13 of the statistical annex.

a/ Alumina content.

/Table 24

Table 24

LATIN AMERICA: EVOLUTION OF STRUCTURE OF MINING PRODUCTION, 1950-1977a/

Product	Percentage breakdown		Growth rates				
	1950	1977	1950-1977	1950-1960	1960-1970	1970-1977	1976-1977
Copper	47.1	53.5	4.3	5.2	2.3	5.8	9.6
Iron ore	1.7	11.1	11.3	22.2	7.7	2.1	-10.8
Zinc	6.8	6.7	3.7	3.6	3.9	3.7	1.9
Bauxite	2.9	6.3	6.8	13.1	7.0	-1.8	7.3
Nickel	-	5.2	10.1	-	12.0	7.5	-0.2
Tin	8.3	3.6	0.6	-3.9	4.6	1.5	2.8
Lead	7.5	3.5	0.8	1.1	0.9	0.5	5.9
Subtotal	74.3	89.9	4.5	5.5	3.8	4.1	4.9
Silver	10.4	5.3	1.2	1.8	0.8	0.8	7.7
Sulphur	0.1	1.2	15.2	42.4	1.3	2.1	-20.4
Gold	5.1	0.7	-3.8	-1.8	-4.7	-5.4	-30.7
Nitrates	4.5	0.6	-3.9	-5.6	-3.2	-2.6	-9.2
Manganese	0.2	0.1	8.1	16.8	8.2	-5.2	-2.6
Subtotal	20.3	7.9	0.1	1.1	-	-1.1	-9.1
Total	94.6	97.8	3.9	4.7	3.3	3.6	3.6
Total production	100.0	100.0	3.8	4.5	3.4	3.3	2.0

Source: See table 12 of statistical annex.

a/ Calculated on the basis of values of production at 1970 prices.

/Table 25

Table 25

COUNTRY SHARES IN VALUE OF WORLD MINING PRODUCTION[a/], 1973

Country [b/]	Percentage share of total value of world production	Per capita value (US$)
Soviet Union	18.5	41
United States	13.9	37
Canada	10.4	256
South Africa	10.4	226
Australia	4.6	189
Chile	3.2	176
China	3.2	2
Zambia	2.8	311
Zaire	2.4	52
Peru	1.9	66
Brazil	1.8	9
Mexico	1.7	15
France	1.3	14
India	1.2	1
Sweden	1.1	74
Poland	1.1	17
Philippines	1.1	14
Federal Republic of Germany	1.1	10
Japan	1.0	5
Mongolia	0.9	328
Namibia	0.8	477
Marocco	0.7	23
Liberia	0.6	198
Bolivia	0.6	54
Venezuela	0.6	27
Subtotal	86.9	61
Latin American countries included above	9.8	25
World total	100.0	14

Sources: See United Nations, E/C.7/97, and CELADE, Boletín Demográfico, Vol. XIII, Nº 6, July 1980.

a/ Calculated on the basis of the mining production for 1976, excluding extraction of hydrocarbons.

b/ Countries with production growth more than US$ 250 million.

/54. The

54. The high growth rates of metallic mineral production achieved by the centrally planned economies in the period 1950-1968 enabled them to increase their share in world production.29/ Up to 1973, the structure of total production did not vary to any great extent, although there were some changes at the product level. The share of the developing countries in production increased in the cases of nickel, iron ore and vanadium, while it went down in the case of lead, zinc, silver, tin and tungsten.30/ In the period 1973-1978, mining extraction in Latin America grew more rapidly than in other regions, but even so its indexes of production with respect to 1970 did not reach the levels corresponding to the centrally planned economies. In contrast, the indexes of metal production were higher than those of other regions, thus reflecting a process of higher industrialization over that period (see figures 2 and 3).

55. Figure 4 shows how world metal production, measured in terms of value added, evolved parallel to the production of manufactures in the period 1973-1978, showing larger variations when production of manufactures went down in 1975, and smaller increases in the period 1976-1978, when the production of manufactures increased considerably. In contrast, the extraction of minerals showed constant evolution in 1976 and 1977, but went down in 1978, thus departing from its parallel course with the production of metals in the period 1973-1975. It is possible that this may have been caused by the joint effect of a higher degree of recovery of metal from the primary ores and a higher degree of recovery of secondary metal from scrap. If this tendency is maintained, the ore requirements, in terms of fine content, will gradually go down for each unit of metal produced: a situation which must be taken into account in defining investment policy by projecting higher growth rates for the metallurgical industry than those for the ore extraction industry.

56. Table 26 shows the figures corresponding to the percentage distribution of proven reserves, production of minerals and metals, and world consumption of metals for the period 1976-1977, with its projection to the year 200.

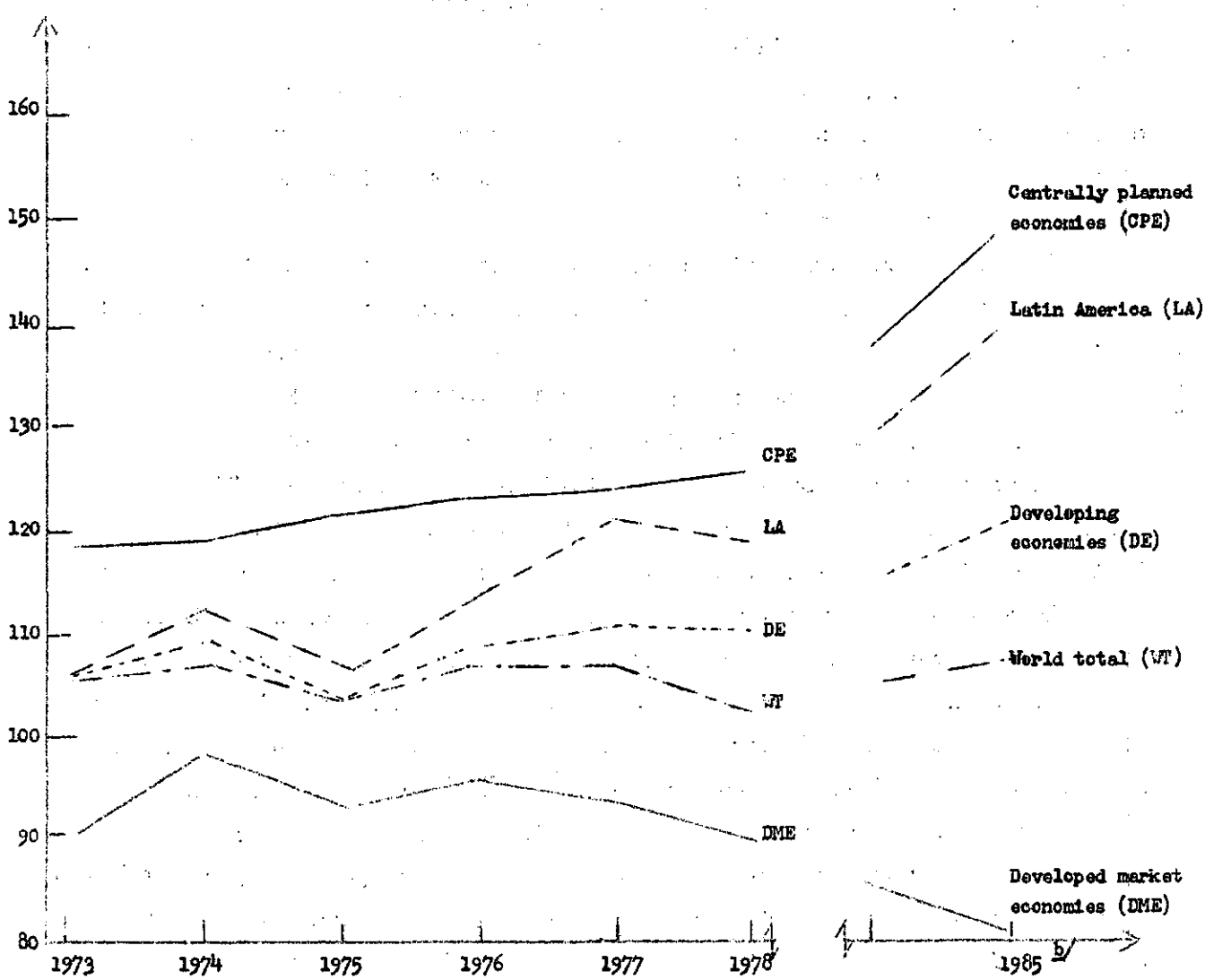
29/ Ibid.

30/ See ESCAP, E/ESCAP/NR.6/6.

/Figure 2

Figure 2

LATIN AMERICA : COMPARATIVE EVOLUTION OF EXTRACTION OF METALLIC MINERALS a/
(Index : 1970 = 100)



Source : U.S. Department of Interior, Minerals Yearbook, 1976.

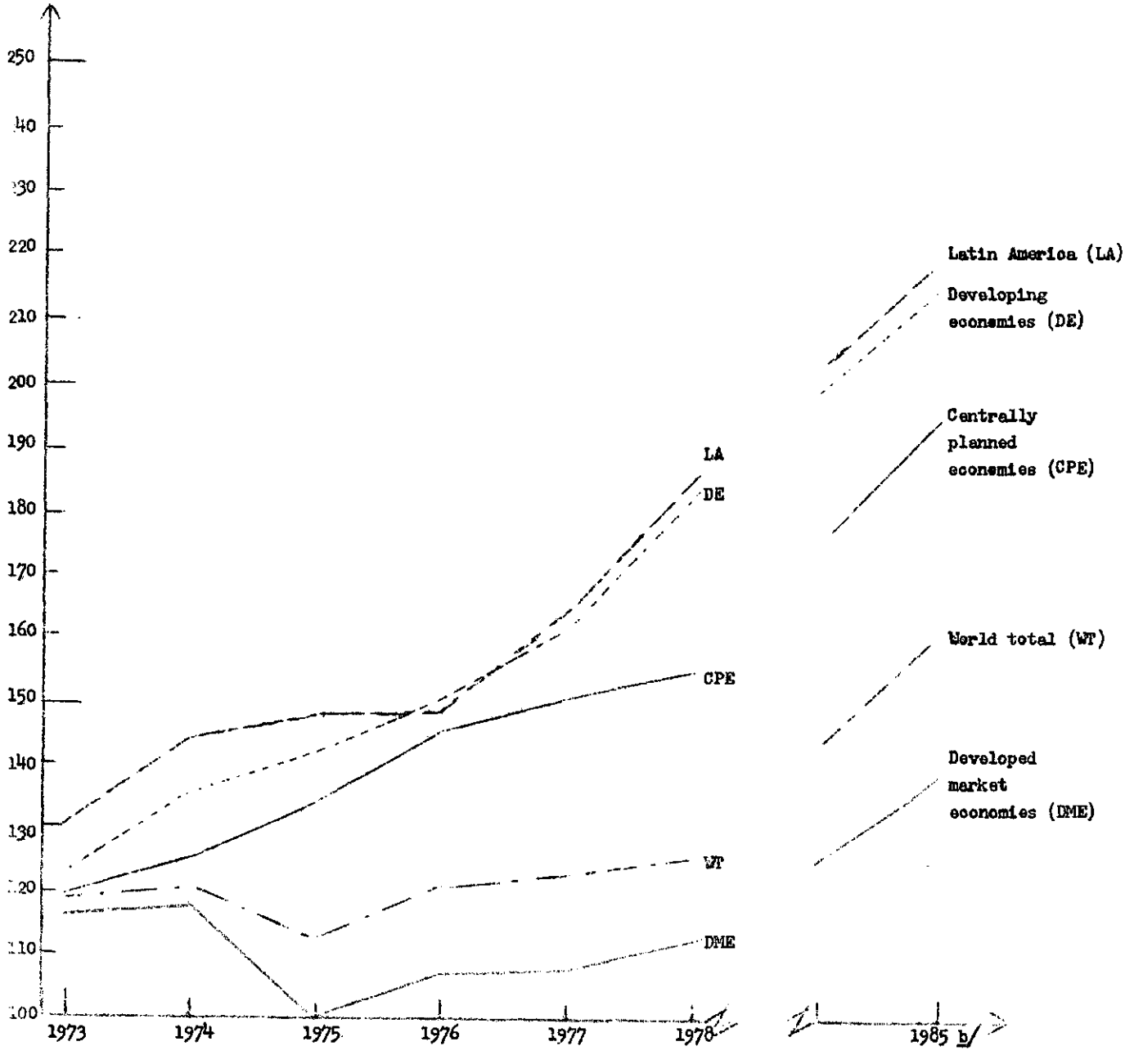
a/ Calculated on the basis of the value added, at constant prices.

b/ The projection for 1985 is based on the trends for the period 1972 - 1978

/Figure 3

Figure 3

LATIN AMERICA : COMPARATIVE EVOLUTION OF METAL PRODUCTION a/
(Index : 1970 = 100)



Source : U.S. Department of Interior, Minerals Yearbook, 1976.

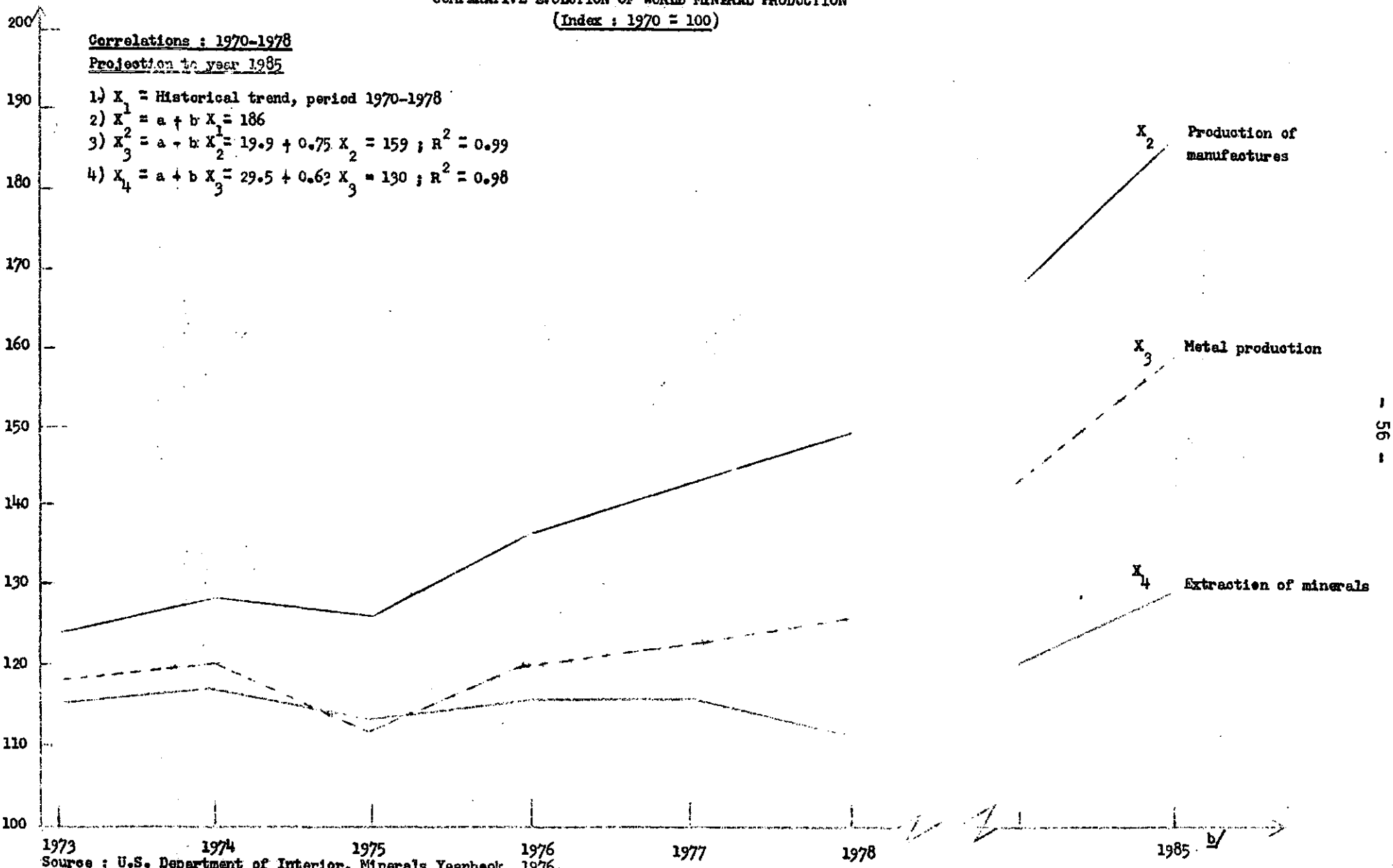
a/ Calculated on the basis of the value added, at constant prices.

b/ The projection for 1985 is based on the trends for the period 1972 - 1978.

/Figure 4

Figure 4

COMPARATIVE EVOLUTION OF WORLD MINERAL PRODUCTION a/
(Index : 1970 = 100)



Source : U.S. Department of Interior, Minerals Yearbook, 1976.

a/ Calculated on the basis of the value added, at constant prices. b/ The projection for 1985 is based on the trends for the period 1972-1978.

/Table 26

Table 26

BREAKDOWN OF WORLD RESERVES, OUTPUT AND CONSUMPTION OF METALS, 1976-1977, AND PROJECTION TO THE YEAR 2000

(Percentages on the basis of volumes)

Product	Geographic area	Proven and probable reserves, 1976-1978	Production			Consumption of refined products	
			Period 1976-1977		Projection to the year 2000 for refined products	Period 1976-1977	Projection to the year 2000
			Ores and concentrates	Founded and refined			
Copper	Latin America	37	18	13	29	4	9
	Asia and Africa	18	25	25	20	15	17
	North America, Western Europe, Oceania	35	34	37	32	55	46
	Socialist countries	10	23	25	19	26	28
Iron ore and iron	Latin America	24	15	3 a/	17	3	16
	Asia and Africa	20	3	21	22	13	18
	North America, Western Europe, Oceania	32	45	45	34	57	37
	Socialist countries	24	37	31	27	27	29
Zinc	Latin America	9	15	5	8	4	8
	Asia and Africa	14	12	17	15	19	24
	North America, Western Europe, Oceania	50	44	47	50	48	36
	Socialist countries	27	29	31	27	29	32
Bauzite	Latin America	36	26	2 b/	27	3	5
	Asia and Africa	34	19	13	34	14	21
	North America, Western Europe, Oceania	27	39	62	33	61	51
	Socialist countries	3	16	23	6	22	23
Nickel	Latin America	13	9	-	13	2	13
	Asia and Africa	42	12	-	23	18	21
	North America, Western Europe, Oceania	40	60	-	50	53	39
	Socialist countries	5	19	-	14	27	27
Tin	Latin America	16	21	11	20	6	8
	Asia and Africa	57	71	67	56	26	32
	North America, Western Europe, Oceania	8	8	22	16	68	52
	Socialist countries	19	-	-	8	-	8
Lead	Latin America	9	14	10	9	5	6
	Asia and Africa	14	8	10	9	10	20
	North America, Western Europe, Oceania	68	44	45	52	55	44
	Socialist countries	9	34	35	30	30	30

Sources: See table 21 in the body of the text and tables 13, 14 and 16 in the statistical annex: ILAFA, La siderurgia latinoamericana en 1977-1978 y sus perspectivas al 2000, Santiago, Chile, 1979 and Leontief.

a/ Steel.

b/ Metallic aluminium.

/Using the

Using the available information, this distribution was carried out for the following groups of countries: (i) Latin America and the Caribbean; (ii) Asia and Africa; (iii) Canada, the United States, Western Europe and Oceania, and (iv) the socialist countries. The estimates for the year 2000 were made on the basis of the trends recorded during the period 1950-1977 and projections made earlier.31/ 32/ Generally speaking, the criterion used in this estimate was to try to equalize the proportion of mineral production with the proportion of reserves and to increase Latin America's contribution to the production of metals. Consumption trends, for their part, show a relative diminution as regards the share of the countries in the third group (the developed countries) and an increase in the shares of the other groups. The situation for each product in the period 1976-1977 was as follows:

(a) Copper: Latin American proven reserves represented 37% of proven world reserves, contributing 18 and 13% of the output of ores and metals. Consumption of metals was only 4%, making Latin America one of the major export regions where both ores and metals were concerned. The percentage of the output of ores and metals of Asia and Africa was greater than that of their reserves, which in turn was greater than that of their consumption, with the result that that region is a net exporter of metals. The proportion of the output of ores and metals of the Western developed countries and developed countries of Oceania was almost the same as their share of world reserves (35); however, their consumption was higher, since it represented 55% of world consumption, which is why that area may be regarded as a net importer of ores and metals. The percentage of the consumption and output of the area covered by the countries with centrally planned economies was greater than their share of world reserves (25 and 10%, respectively), which means that that area should be classified as a net importer of ores.

(b) Iron and steel: 56% of world reserves are concentrated in the developed and socialist countries, where consumption of iron and steel is greater than the above-mentioned reserves (84%) and at a similar level to that of the output of ores. In contrast, output of metals was relatively low,

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31/ See Mikesell.

32/ See Leontief.

/owing to

owing to Oceania's high volume of exported ore to Japan and the volume of metal imported from Japan by the groups in question. Latin America, which has 24% of world reserves, only produced 15% of the ore and 3% of the metal, the same proportion as that of its consumption, which thus made it a major exporter of ores, particularly from Brazil to Japan. Owing to the above-mentioned pattern, Asia and Africa, which have 20% of reserves, only produce 3% of the ore and 21% of the metal, which was a higher percentage than that of consumption (13%), with the result that this area may be regarded as a net importer of ore and a net exporter of metal.

(c) Zinc: the percentage of reserves and output was similar (77%) to that of the consumption of the developed and socialist countries as a whole, with the differences from one group to the other referred to below. Output was slightly lower than consumption and reserves in the developed countries, which means that they could potentially be self-sufficient as a group. The opposite situation applies in the group of socialist countries, which thus constitutes an area of net importation of ores and exportation of metals. Asia and Africa attained a lower percentage with regard to output of ores and a higher percentage with regard to output of metal than that corresponding to their reserves, but those percentages were, in turn, lower than that of their consumption, which made the area a net importer of both ore and metal. Latin America attained a higher percentage with regard to output of ore than that corresponding to its reserves, but its output of metal was proportionately lower than that of its reserves and similar to that of its consumption, which is why it may be regarded as a net exporter of ore.

(d) Bauxite and aluminium: the most extensive bauxite deposits are located in Latin America (36%) and Asia and Africa (34%); however, the highest percentage of output and consumption of aluminium (85%) is concentrated in the other two groups of countries, which makes the first two groups of countries net exporters of ore.

(e) Nickel: 82% of the reserves of nickel are concentrated in Asia and Africa and in the developed countries; however, output and consumption were concentrated in the developed and socialist countries (80%), with the differen that the former group were net exporters and the latter net importers. The output levels of Asia and Africa were proportionately lower than their

/consumption and

consumption and reserves, which means that that area should be regarded as a net importer. The percentage of Latin America's output was also lower than that of its reserves and greater than that of its consumption, with the result that the region may regard itself as a net exporter of the product in question.

(f) Tin: there is no data available on the socialist countries' output and the consumption of tin, but it is estimated that the relevant percentages would be lower than that of their reserves. The percentage of metal output was higher than that of the developed countries' reserves, although it did not equal the high percentage of their consumption, which makes that group of countries a net importer of both ore and metal. The percentage of Asia and Africa's output was higher than that of their consumption, for which reason both may be regarded as net exporters of metal. The situation was similar in Latin America, except for the fact that Latin America was a net exporter of ore and metal.

(g) Lead: the developing countries' percentage of output was lower than that of their reserves (68%) and consumption (55%), making the countries in question an area of net importation of metal. Their output was higher than their consumption and reserves (35, 30 and 9%, respectively), making them net exporters of metals and possibly net importers of ores. In the group of Asian and African countries output maintained the same volume as that of their consumption but was below the level of their reserves. Latin America's percentage of output was higher than that of its consumption and reserves, placing it in the position of a net exporter of ore and metal.

57. In short, Latin America was an exporter with regard to the seven ores considered and the metals copper, tin and lead. The other areas of net exportation were: Asia and Africa with regard to exportation of bauxite and the metals copper, steel and tin; North America, Western Europe and Oceania with regard to nickel, and the socialist countries with regard to iron ore and iron and the metals zinc and lead. The Western developed countries and Oceania were areas of net importation of copper, zinc, bauxite and tin in the form of ores and of the metals copper, steel, tin and lead. The socialist countries were areas of net importation of copper, zinc and bauxite ores.

/58. On

58. On the basis of proven reserves and the projection of consumption of metals to the year 2000, Latin America's output and exportation policy could be described as follows:

(a) High growth rates in output of the following ores: copper, iron ore and nickel; and of the following metals: copper, steel, zinc, aluminium, nickel, tin and lead.

(b) An increase in the share of world exports of the following metals: copper, steel, aluminium, tin and lead.

59. On the basis of the criteria set forth, a projection to the year 2000 of Latin American output and exportation of ores and metals and consumption of metals was prepared, with the following characteristics: (see table 27)

(a) The annual growth rate of output of ores would vary between 1.9% in the case of tin and 8.8% in the case of copper.

(b) Taking previous extraction indices as a basis, proven reserves at 1978 would be exhausted within a period varying from 25 years in the case of zinc to 370 years in the case of bauxite.

(c) The annual growth rates of output of metals have been projected as being between 3.5% in the case of lead and 22% in the case of aluminium.

(d) It has been estimated that there will be a growth rate of 3.2% in the case of iron ore exports and of 6.8% in the case of copper exports. The remaining exported ores will have negative rates in order to enter the process of metallurgical output.

(e) Growth rates of exportation of the metals lead, tin and copper have been estimated at 2.3, 5.1 and 10.5%, respectively. It is assumed that by the year 2000 Latin America will have a share in exportation of the metals iron and aluminium, whereas its share of exportation of zinc and nickel will drop, in the first case owing to the relative scarcity of zinc reserves and in the second case owing to competition from surplus production over and above consumption of the Western developed countries and the developed countries of Oceania.

Taking the above projections as a basis, Latin America's share of output and consumption of metals will increase until the year 2000 with regard to output of ores, whereas, with the exception of iron, its share of exports will drop, this hypothesis being based on the assumption that an accelerated process of metallurgical industrialization will take place at the regional level.

/Table 27

Table 27

LATIN AMERICA: PROJECTION OF THE EVOLUTION OF THE MINING SECTOR TO THE YEAR 2000

(Thousands of tons of metal content)

Product	Period	Years of duration of proven and probable reserves at 1978 a/	Output of ore	Output of metals	Consumption of metals	Net exports	
						Ores	Metals
Copper	1976-1977	67	1 418	918	381	500	537
	2000	-	9 970	7 720	2 425	2 250	5 295
Growth rate		-	8.8	9.7	8.4	6.8	10.5
Iron	1976-1977	290	112 945	22 000b/	26 000b/	86 945	-
	2000	-	629 500	448 000b/	432 000b/	181 500	16 000b/
Growth rate		-	7.8	14.0	13.0	3.2	-
Zinc	1976-1977	25	916	319	247	597	72
	2000	-	1 586	1 450	1 450	136	-
Growth rate		-	2.4	6.8	8.0	-6.2	-
Bauxite	1976-1977	370	21 167	338c/	460c/	20 707	-
	2000	-	44 018	32 749c/	6 363c/	11 269	26 386c/
Growth rate		-	3.2	22.0	12.1	-2.6	-
Nickel	1976-1977	270	67	67	11	-	56
	2000	-	287	287	287	-	-
Growth rate		-	6.5	6.5	15.2	-	-
Tin	1976-1977	63	40	22	10	18	12
	2000	-	61	61	23	-	38
Growth rate		-	1.9	4.5	3.7	-	5.1
Lead	1976-1977	36	488	344	213	144	131
	2000	-	781	760	537	21	223
Growth rate		-	2.1	3.5	4.1	-8.0	2.3

Product	Percentage breakdown						
	Output of ores, 1976-1977 and 2000	Output of metals		Consumption of metals		Net exports	
		1976-1977	2000	1976-1977	2000	1976-1977	2000
Copper	100	65	77	27	24	73	76
Iron	100	19	71	23	69	77	31
Zinc	100	35	91	27	91	73	9
Bauxite	100	2	74	2	14	98	86
Nickel	100	100	100	16	100	84	-
Tin	100	55	100	25	38	75	62
Lead	100	70	97	44	69	56	31

Source: See table 21 in the text and tables 13 and 14 of the statistical annex; ILAFA, La Siderurgia Latinoamericana en 1977-1978 y sus Perspectivas al 2000, Santiago, Chile, 1979.

a/ Years of duration of proven and probable reserves at 1978, in accordance with average output for the period 1978-2000.

b/ Steel.

3. Other characteristics of international trade in ores and metals

60. In 1976 65% of the total value of international trade in ores, metals and metal products was accounted for by the developed countries' exports, 26% by those of the developing countries and the remaining 9% by those of the countries with centrally planned economies. Among the second group of countries, Latin America contributed only 6% of such trade.33/ In turn, exported ores and metals represented 6.4% of total trade. During the period 1970-1977 the evolution of metal prices was favourable, with the exception of the price of copper, which means that the increase in the value of Latin American exports was to a greater extent attributable to such evolution than to the evolution relating to its physical volume (see table 28).

61. In 1976 80% of Latin American exported ores and metals were destined for the developed market-economy countries, 12% for the countries of the region itself, 7% for the countries with centrally planned economies, and only 1% for other developing countries. It should be borne in mind that, if the proportion of proven reserves is maintained, Asia and Africa will be potential importers of zinc and lead and the socialist countries will be potential importers of copper, iron, bauxite, nickel, tin, zinc and lead. The chief selling markets of the exports of other developing countries were also in the developed countries, which absorb 71% of such exports. An aspect that should be stressed is that 25% of such exports were destined for developing countries and that Latin America absorbed 1%. The groups of developing and socialist countries focused their exports on countries in their own areas in percentages amounting to 69 and 63%, respectively. Eighteen per cent of the exports of the former group of countries were destined for developing countries, whereas 29% of the exports of the latter group were destined for developed countries. In short, 73% of the ores and metals exported in the world came from developed countries, 10% from the other developing countries, 10% from the socialist countries and 10% from Latin America. Developed countries accounted for 67% of imports, the socialist countries for 15%, other developing countries for 14% and Latin America for 4%, which means that the group of developed market-economy countries and Latin America may be regarded as areas of net exportation (see table 29).

33/ United Nations, Monthly Bulletin of Statistics.

/Table 28

Table 28

LATIN AMERICA: INDEX OF MINERAL EXPORTS

Product	Period (index 1970=100)	Value	Price	Volume
Bauxite	1970-1975	189	142	133
Copper	1970-1977	122	93	131
Tin	1970-1977	310	294	105
Lead	1970-1977	183	204	90
Zinc	1970-1977	314	200	157
Nickel	1972-1977 a/	194	176	110

Source: See tables 6, 12, 26 and 32 in the text and tables 2, 5 and 7 of the statistical annex.

a/ Index 1972=100.

/Table 29

Table 29

BREAKDOWN OF INTERNATIONAL TRADE IN ORES, METALS[a/] AND METAL PRODUCTS, 1976

(Percentages)

Imports \ Exports	Latin America	Other developing economies	Developed market economies	Centrally planned economies	Total ores and metals exported	Share of exported ores and metals	Share of total exports
Latin America	12	1	80	7	100	7	6
Other developing economies	1	24	71	4	100	10	17
Developed market economies	4	16	69	11	100	73	67
Centrally planned economies	2	6	29	63	100	10	10
Share of imported ores and metals	4	14	67	15		100	100

Source: See United Nations, Yearbook of International Trade Statistics, 1977.

a/ Calculated on the basis of the value of exports.

62. An estimate of possible trends in international trade in ores and metals until 2000 in net terms at the level of each region has been made on the basis of the projections in table 26. According to this projection, Latin America will export copper, iron and bauxite ores and metals to the market-economy developed countries and the socialist countries, and lead to Asia and Africa; zinc ores to Asia and Africa and metal containing tin to the developed countries (see table 30).

63. In the period 1970-1978 total Latin American imports at current prices grew at an annual rate of 19.7%. In the same period ores and metal and engineering products grew at an annual rate of 18%. Taking imports in this group as a whole, ores (20%) and metal-based plant and machinery (18.5%), had the highest growth rates. However, it should be borne in mind that imported ores and metals represented over 6% of total imports, whereas imported engineering products accounted for 36% of such imports (see table 31). The projection to the year 2000 assumes that Latin America will be able to meet its requirements relating to ores and metals that are currently being met by other geographic areas, as a basis to support the regional process of manufacturing engineering products (see table 30 once again).

64. Taking 1970 as a basis, the price index for ores and metals at 1978 was lower than that for exported primary products, excluding the index for hydrocarbons in both cases, but higher than the index for manufactured exports (252, 257 and 219, respectively). In the same period the price index for ores was higher than that for metals, which would appear to indicate a lower relative increase in the cost of processing charged in respect of the smelting of ores.34/ During the period 1950-1979 the evolution of prices for ores was favourable in nominal terms; however, if those prices are deflated in order to establish the evolution of their real value, it will be noted that that evolution was unfavourable as follows: throughout the entire period in the case of lead and zinc, in the 1950s in the case of tin, from 1976 onwards in the case of copper, and in 1976 and 1978 in the case of bauxite (see table 32). Between 1970 and 1978 the terms of trade for metals, as compared with the prices of manufactured goods, were generally unfavourable, with the exception of those of tin, for which prices began to be favourable from 1974 onwards. The other

34/ See United Nations, E/C.7/96.

/Table 30

Table 30

PROJECTION OF THE BREAKDOWN OF NET INTERNATIONAL TRADE IN ORES AND METALS TO THE YEAR 2000

(Thousands of tons)

Imports \ Exports	Latin America	Asia and Africa	North America, Western Europe and Oceania	Socialist countries	Total
Latin America					
Bauxite	-	-	29 516	8 139	37 655
Copper	-	-	2 903	4 642	7 545
Tin	-	-	38	-	38
Iron ore and iron	-	-	121 600	75 900	197 500
Lead	-	244	-	-	244
Zinc	-	136	-	-	136
Asia and Africa					
Bauxite	-	-	-	15 947	15 947
Copper	-	-	-	302	302
Tin	-	-	89	23	112
Iron ore and iron	-	-	-	42 600	42 600
Nickel	-	-	-	466	466
North America, Western Europe and Oceania					
Nickel	-	-	-	31	31
Lead	-	282	-	1 758	2 040
Zinc	-	1 695	-	839	2 534

Source: See table 26 in the text and table 16 in the statistical annex.

/Table 31

Table 31

LATIN AMERICA: EVOLUTION AND BREAKDOWN OF IMPORTED ORES AND METAL PRODUCTS[a/]

Lines	Percentage breakdown 1978	Growth rate 1970-1978
Metal-bearing ores and scrap containing metal	1	20.0
Iron and steel	4	16.2
Non-ferrous metals	1	15.0
Other products manufactured with metal	2	14.6
Plant and machinery in the field of transport	34	18.5
Total ores and metal products	42	18.0
Total Latin America imports	100	19.7

Source: See table 17 of the statistical annex.

a/ Calculated on the basis of the FOB value of exports to Latin America at current prices.

/Table 32

Table 32

EVOLUTION OF THE NOMINAL AND REAL PRICE OF ORES ACCORDING TO QUOTATIONS OF THE LONDON METAL EXCHANGE

(Indices, 1950 = 100)

Period	Deflator a/	Aluminium (bauxite)		Copper		Tin		Nickel		Lead		Zinc	
		Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real
1951-1955	119	133	112	149	125	114	96	132	111	108	91	95	80
1956-1960	125	165	132	138	110	104	83	163	130	81	65	70	56
1961-1965	130	164	126	169	130	143	110	178	137	75	58	76	58
1966-1970	136	180	132	274	201	166	122	226	166	90	66	85	63
1971-1975	221	220	100	293	133	264	119	363	164	136	62	215	97
1976	306	286	93	286	93	373	122	502	164	154	50	217	71
1977	336	364	108	266	79	524	156	558	166	211	63	180	54
1978	382	306	80	276	72	626	164	-	-	225	59	180	47
1979	433	-	-	403	93	752	174	-	-	411	95	227	52

Source: See table 5 of the statistical annex and United Nations, E/C.7/96.

a/ See CIF unit value of manufactured products exported from developed countries to developing countries.

/metals for

metals for which the terms of trade were favourable during the period in questio were zinc between 1972 and 1977 and lead in 1973 and 1974. The most unfavourable evolution applied to copper, particularly in 1972 and during 1975-1978.

65. The future evolution of the prices for ores and metals does not seem very favourable in absolute terms in the long term, since the latest projections indicate that their growth until the year 2000 will be lower than that attained in the period 1955-1980.35/ For example, it is estimated that the annual growt rate, which was 12.5% in the period 1970-1978, will be around 4.5% in the period 1970-2000, with a marked acceleration in the period 1970-1990 and a sharp drop in the 1990s. The explanation for this evolution could be the gradual exhaustion of proven reserves during the first period and utilization of probable reserves during the second period. To the uncertainty concerning the volume and cost of exploiting probable reserves it is necessary to add the uncertainties concerning the possibilities with regard to, and output cost of, substitutes and recovery of secondary metals from scrap. Depending on the behaviour of the above-mentioned factors, it is estimated that the price of copper and lead could rise at an annual rate of 1 to 10% in the case of the former product and of 2 to 9% in the case of the latter product. Nickel and zinc prices will rise at annual rates of 6%, those of bauxite at rates of approximately 2% and that of iron will remain virtually constant. It is considered that the behaviour in question will also be irregular during the various periods, it being estimated, for example, that the outlook for copper will be more favourable in the short term but will subsequently decline in the medium term. Similar behaviour is anticipated in the case of the price of bauxite and aluminium, but in connexion with the medium and long-term period.36/

66. At the same time, despite efforts to stabilize or improve prices, it is estimated that prices will continue to be subject to strong fluctuations in the short term, depending on changes in the two components of demand, consumption and establishment of stocks of a commercial or strategic nature. Relatively speaking, it is estimated that the increase in the price of ores and metals will be greater than that of other primary products and of manufactures, which means that the terms of trade will be favourable for the major exporters of the products in question, perhaps to a great enough degree to cover their trade deficits.37/

35/ Ibid.

36/ See United Nations, E/C.7/96.

37/ See Leontief.

III. FORMATION AND DISTRIBUTION OF MINING INCOME

67. One of the basic characteristics of mineral economies is the existence of a financial surplus or income defined as the income remaining over and above the "normal" remuneration of factors of production. "Normal" remuneration means the minimum earnings necessary to induce the employment of these factors of production. This income may be generated and distributed throughout the whole production and marketing process, from the extraction of the ore until the final products are sold.

68. The generation and distribution of mining income depend on the following factors:38/

(a) Differences in the quality and presentation of the ore and in access to it and transport costs mean that a surplus is generated by the richest deposits which are provided with adequate transport infrastructure and lower exportation and marketing costs - a surplus which for this reason is called the differential income.

(b) The relative scarcity of a product due to exhaustion of the known deposits or by its concentration among a small number of producers may generate surpluses when accompanied by a rapid and sustained price increase as is happening in the case of hydrocarbons and, to a lesser degree, that of tin (scarcity rent).

(c) Monopolistic rents can arise as a result of the structure of the international market for each product. Generally speaking, there are no open markets for some minerals, which are subject to monopolistic and monopsonistic structures. First, when products are concentrated in a small number of countries or in specific areas, there is the possibility of producer-country cartels or associations with enough power to impose certain price levels on the international market. Second, transnational corporations which intervene in various stages of production and marketing not only exercise a powerful influence on the market because of the magnitude of their operations but also siphon off some of the mineral rent by providing ore transformation, transport and marketing services in which they also hold

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38/ See Nankani.

/a monopoly

a monopoly position. Thirdly, by building up commercial stocks or strategic reserves, it is possible to devise speculative ways of generating and appropriating this kind of surplus.

(d) Quasi-rents in the mining industry arise from the transfer of the excess costs of the factors of production to the consumer. So much capital is required to do this that many projects exhaust the possibilities of ordinary means of financing, especially those provided by multilateral agencies for development promotion. In this case, the main sources of financing are concentrated in suppliers of machinery and technology, commercial banks or transnational corporations engaged in production and marketing, which, to compensate for the risks involved in this kind of investment, raise the cost of the capital. At the same time, national wage policy or trade-union action may mean that miners' wages can obtain a surcharge.

(e) Sharp short-run price fluctuations due to variations in demand in the presence of low cost and production elasticity may result in either positive or negative rents which will make the income of producers higher or lower than anticipated.

1. Application of Ricardo's principle to mineral rent

69. David Ricardo's land rent principle may be applied to mining with the difference that in agriculture the fertility of first-rate land may be maintained or even improved while in the case of mining, ore deposits are gradually being exhausted.

70. Deposits would be classified in four categories depending on their metallic content (degree of purity of the ore they contain).39/ As a general rule, deposits in the second and third categories are now under exploitation while known deposits in the first category are probably virtually on the brink of exhaustion. It must, however, be borne in mind that both the exploitation of minerals and the countries in which minerals occur are in different cycles or stages of a cycle,40/ and it is precisely those differences which generate or increase mineral rents, as will be observed from the following outline:

39/ See Mamalakis.

40/ See Nankani.

/(a) During

(a) During the past century the price of all minerals with the exception of precious metals was determined on the basis of production costs. Deposits containing ore with a high metallic content would require low levels of technology in the phases of both extraction and reduction, and for that reason the price of minerals obtained from them was relatively low. The gap between costs and prices gave rise to mineral rent, but the deposits were exhausted without the producer country deriving any further advantage from them.41/

(b) The demand for metals began to rise at the beginning of the century, and their prices rose proportionately, which generated a considerable surplus (or scarcity rent), which in some cases constituted the financial base of the future transnational corporations in the sector. For example, prior to the First World War, the cost of producing one ton of tin was 30 pounds sterling, while its price exceeded 200 pounds. As a result, deposits in the first category were exploited on a very rapid rate, resulting in the depletion of most of them. Second-category deposits then began to be exploited, for which it was necessary to invest heavily in infrastructure and in the extraction and reduction of ore in order to be able to keep costs at the level of prices, so that first-category deposits which had not been depleted or had been discovered subsequently produced differential rent.

(c) The steady increase in demand resulted in the depletion of many second-category deposits, so that, in the same way, third-category deposits with new technology and capital requirements, especially in the recovery phase of extractive metallurgy, began to be exploited. The similarity in the prices and the exploitation costs of third-category deposits has meant that first- and second-category deposits generate another differential rent.

(d) It is possible that this process may continue with the exploitation of fourth-category deposits; however, the cost increment might be curtailed by the production of substitutes, the recovery of secondary metals from scrap and the mining of deep sea nodules. There are, for example, indications that the metallic contents of world copper reserves is less than 1% on average while the cost of exploitation is around US$ 0.80 a pound. There

41/ See Mamalakis.

/are, however,

are, however, places in the world where deposits with contents of between 0.3% and 4% have been under exploitation at costs varying from US$ 1.30 to 0.30 a pound, with a marked differential rent resulting from those in the latter group. If, for example, the price exceeds US$ 1.60 a pound, aluminium or secondary copper would be in a good position to compete with primary copper.42/ It should be borne in mind that not only are these differences in quality in different deposits, but different degrees of purity can also be found in the same deposit. At a specific level of exploitation or standard of reduction, there will be a given number of mineral reserves with an average or standard content. If the reduction standard is lowered, the number of such reserves will increase, but the metallic content will decrease. This will result in higher extraction costs because it will be necessary to dig deeper and handle a larger quantity of ore, and in higher reduction costs because large surpluses originally produced by a deposit may later on begin to decline sharply - a problem which should be considered when the legal foundations of the mining industry are laid.

71. The presentation of deposits is another factor which may generate differential rent because of variations in extraction costs and concentration. Metals may be disseminated in rock (porphyry or porphyritic rock), generally with a low metallic content, and may lie deep or close to the surface. When ore is close to the surface, it may be extracted through an open-pit system, which lowers the cost of extraction. Complex mineral may also be found concentrated below the surface in fissures, veins or pockets, which means high extraction costs but perhaps lower reduction costs because of the higher metallic content. The exploration of the ocean floor has made it possible to determine the existence of small nodules of complex minerals which may be extracted by, for example, suction pumps.

2. The relative scarcity of mineral resources

72. Because of the high cost of mineral prospecting and exploration, private investment is usually made in quantities sufficient to identify reserves which guarantee the viability of new projects and is not aimed at making an inventory of the mineral resources of a country or region. In exploitation

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42/ See Mining Corporation of Panama.

projects an attempt is usually made to maintain a constant ratio between reserves and production, and for that reason exploration and deposit preparation proceed at the same rate as production. This approach does not yield full information on the volume and quality of mineral resources available, which is why no predictions can be made as to when there will be periods of absolute scarcity in the face of any evolution in demand. In most cases, as was pointed out in the preceding chapter, the relative scarcity of known reserves can be estimated. The supply of proven reserves (R1), probable reserves (R2), potential reserves (R3), deep-sea nodules and secondary metal (scrap) may be enough to meet the world demand for some of the main metallic minerals for the next 100 or 200 years. For that reason, a reference to the generation of scarcity rent implies something which is circumstantial rather than static or permanent and varies with each new analysis of cost differentials; to put this in another way, relative scarcity will be maintained so long as the price level does not permit the exploitation of marginal deposits, so that costs remain lower than the price and the oligopoly continues to make a profit. When the price rises, profit in terms of scarcity rent is lost, but differential rent is obtained, which in absolute terms may be smaller, equal to or greater than the scarcity rent.

73. During the period 1961-1965, 35% of investment for mineral prospecting and exploration in the market economies was concentrated in the developing countries. This share fell to 30% in the subsequent period (1966-1970) and to 14% during 1971-1975. Conversely, 80% of the resources in the latter period were directed towards four developed countries (the United States, Canada, Australia and South Africa).43/ As has been pointed out in earlier chapters, mineral resources constitute part of the patrimony or wealth of developing nations, and their value depends on the market situation, which is basically determined by the buyers who regard such reserves as simple raw materials dependent on the industries of the developed countries and to be acquired at the lowest possible price.44/ The experience of the past seems to indicate that it is not only those countries with the most mineral

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43/ See Mikesell.

44/ See Agid News.

resources which are in a relatively advantageous position but also those where mineral exploitation is relatively less expensive since this enables them to realize big profits from differential or scarcity rents - an aspect which must be taken into consideration in orienting the policy relating to incentives and investment in connexion with mineral prospecting and exploration. It must, however, be borne in mind that in mining there are ample possibilities for taking advantage of economies of scale, so that the unit cost of large deposits may be reduced as their volume of production rises. As will be observed later on, cost analysis is of singular importance with regard to the impact had on mineral rent by the production of secondary metal, deep-sea nodules and substitutes.

74. One process which siphons off some of the mineral rent is the production of secondary metals from scrap, a process which is now being carried out almost entirely by developed countries. The cost of conversion or recycling is equal to or less than the cost of smeltering and refining primary metal, and the evolution of its price is remarkably parallel to that of the market price of primary metal, with the difference that there is great production elasticity with respect to price variations (about 3% for every 10% of price variation).45/ Therefore, the differential rent is distributed among the smelters and scrap dealers and depends on its buying price, which includes only production, processing, storage and transport costs; i.e., it does not include the costs of prospecting, exploration, extraction and reduction of raw materials. It should also be borne in mind that over 90% of international trade in scrap is carried out among developed countries because not much scrap accumulates in developing countries.46/

75. Information on stocks of scrap is in very short supply, and only very rough estimates are available. In the case of copper, it is estimated that 220 million metric tons accumulated in 1974; i.e., nearly 50% of the proven reserves of the primary metal and close to 30 times more than world consumption in that year. In 1977, production of the secondary metal, excluding production in countries with centrally planned economies, amounted

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45/ See Gluschke, Shaw and Varon.

46/ See United Nations, E/C.7/101.

/to the

to the following percentages of world consumption: lead, 50%; copper, 47%; steel, 32%; tin, 24%; aluminium, 23% and zinc, 21%. It has also been estimated that recovery of secondary metal has reached 55% of the amount of lead scrap available and 65% of that of other metals. Recovery might reach 95% in cases where prices of a primary metal show further rises. Experience in recent years has shown a high demand-price elasticity in that a price rise causes demand to grow more slowly and the supply of the secondary metal to increase. It is estimated, for example, that if the demand for copper fell at a rate of 1% up to the year 2000, it could be satisfied with secondary metal. During the period 1967-1977, however, the percentage of total world consumption made up of secondary metal on hand fell in the case of copper (from 58.7% to 47%), tin (35% to 23.7%) and zinc (24% to 21%) and rose in the case of lead (46.1% to 49.7%) and aluminium (22% to 23%).47/ One cause of these variations was obviously the durability of the goods concerned, which in the case of those made of lead is estimated at 8 years while for those made of the other metals, it is 30 years. If, for example, the durability of copper products were to increase to 40 years, secondary production of that metal would only meet 15% of the demand in the year 2000.48/ In summary, it is estimated that in the year 2000 the production of secondary metal could supply close to 55% of the world demand of the metals referred to.49/

76. Another important aspect affecting the future market of some metals and hence the generation and distribution of mineral rent is the exploitation of deep-sea nodules. These nodules are made up of a complex mineral composed of manganese oxide(8% to 40%), in combination with cobalt (0.1% to 2%), nickel (0.2% to 2%) and copper (0.3% to 1.1%). Although they have been known for over a century, their commercial exploitation was not considered until 10 years ago. This and the fact that data concerning them is in the hands of private enterprises makes it difficult to make an accurate estimate of the possible reserves. In various studies 50/ the following metal reserves

47/ Ibid.

48/ See Radetzki and Svensson.

49/ See Leontief.

50/ See Gluschke, Shaw and Varon.

/have been

have been estimated on the basis of the area covered by the nodules, the density of the nodules in each area and their metallic content: manganese, 3.9 billion tons; nickel, 190 million tons; copper, 173 million tons and cobalt, 39 million tons. In the case of manganese, nickel and cobalt, these reserves are greater than the reserves found on land. Five consortia and a number of transnational corporations have embarked on detailed prospecting and exploration operations and the feasibility studies made in this respect have been positive. According to these studies, a mining project would need to have an annual capacity of not less than 3 million metric tons of dry nodules, with the following pure metal content: 30 000 to 31 000 metric tons of copper, 35 000 to 37 000 metric tons of nickel, 6 000 to 7 000 metric tons of cobalt and close to 700 000 metric tons of manganese.51/ 52/ The investment in an exploitation of this type has been estimated at 1.5 billion dollars in 1978 with an internal rate of return of 18%, i.e., similar to the rate of return of the new projects on land deposits of copper. In other studies rates of return on the order of 50% are estimated.53/

77. Some estimates made on the 19 known or announced projects indicate that the production of sea-bed nodules could meet the following percentages of the demand projected for the year 2000:54/ 55/ cobalt, 115%; manganese, 33%; nickel, 80% and copper, 7%. Because cobalt is produced in association with the other products, its production may not be reduced without reducing the production of the others. The production of cobalt in such quantities would undoubtedly change the structure of the cobalt market. Since its main property is resistance to high temperatures, cobalt could be used as a substitute for some nickel products. The production of nickel is 20 times higher than that of cobalt, and for this reason its floor price would be determined by the price of nickel, which could mean a reduction on the order of 70%. Although nodule production would not have a very great impact on the

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51/ See United Nations, E/C.7/96.

52/ See Adams.

53/ Ibid.

54/ Ibid.

55/ United Nations, E/C.7/96.

volume of copper produced because that is highly sensitive to prices, the impact on total earnings would be substantial and would affect the economies of countries with land deposits. It has been estimated that the earnings of the developing countries from the production of these four minerals in the year 2000 would be 26% lower as a result of the production of deep-sea nodules. Nickel would account for 22% of this loss - estimated at over 7 billion dollars - while copper would account for 32%, cobalt for 15% and manganese for 1%.56/ It is possible that this impact would begin to make itself felt during the 1990s, when the 19 projects referred to would begin to produce at full capacity. For the purpose of reducing these adverse effects on the earnings and mineral rent of the developing countries, a study of the best possibilities offered by the following lines of action might be made in the case of each metal:

(a) Exploitation of high-quality deposits, thereby making it possible to decrease productions costs.

(b) Integration of the production of the mining industry at regional or subregional level.

(c) Diversification of mining production and reduction of the role played by the four metals referred to.

(d) Participation in the income generated by the exploitation of sea-bed nodules. In this connexion, if the principle that marine wealth is the patrimony of all countries is widely endorsed, it would have to be administrated by an international body which could distribute some of the income generated among the developing countries producing these metals. It should, however, be borne in mind that the Congress of the United States approved legal instruments which allow mining companies to continue exploring and exploiting these resources.

78. The latest technological advances indicate that there is a wide range of possibilities for the substitution of metals provided that the substitute has similar properties to the product it is going to replace. Thus, for example, copper may be replaced in electric cables by aluminium which while possessing only 67% of the conductivity of copper, weighs only a third as

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56/ See Adams.

much, making its use an advantage when light weight is required. In other uses, such as in building or the manufacture of pipes, copper may be replaced by steel alloys or plastics. The following is a list of the main substitutes for other metals:57/

(a) Zinc by aluminium, magnesium and plastics.

(b) Tin by aluminium, steel in conjunction with chromium, plastics.

(c) Antimony by lead, titanium, zinc, chromium, zirconium, calcium, and tin alloys (tin-plate).

(d) Lead by nickel-cadmium, zinc-cadmium, aluminium, plastics.

(e) Cobalt by molybdenum, vanadium, tungsten, manganese, chromium, copper.

(f) Tungsten by titanium, tantalum, molybdenum.

(g) Manganese by titanium, zirconium, molybdenum.

(h) Nickel by chromium, manganese, molybdenum, cobalt, titanium.

79. From the theoretical point of view, substitutes may be used as a means of coping with changes in relative prices; however, it is done only when the price changes are expected to remain in force for a considerable length of time since substitution necessitates changes in product designs and production processes. Historically, the substitution of one metal for another basically represents an attempt to give goods other qualities of a specific nature. In this connexion, the various types of metal substitution are listed below, since each of them has different effects on the distribution of mineral rent:58/ 59/

(a) Physical substitution: the substitution of one metal for another input owing to a change in their relative prices.

(b) Quantitative substitution: a reduction in the amount of metal used in each unit of the final product.

(c) Invisible substitution: the substitution in the market of a new product for another product with a given metallic content.

(d) Substitution of production procedures: the substitution of a product with a lower metallic content for another product having the same use.

57/ See United Nations, E/C.7/101.

58/ See Gluschke, Shaw and Varon.

59/ See United Nations, E/C.7/101.

/(e) Functional

(e) Functional substitution: the replacement of big lines of production because of sweeping technological changes; in the case of transport, for example, the manufacture of aircraft instead of railways.

80. One of the factors which determines the situation and level of metal prices is the formulation and use of commercial stocks, strategic reserves or buffer stocks which may have an effect on the changes in and distribution of mineral rent. The formation and use of commercial stocks play an important role in price variations since purchases and sales involve large quantities of goods which in one way or another help to balance the difference between the volume of metals consumed and the volume produced. The difference between the buying and selling price generates substantial rents which benefit those in control of this phase of the marketing process. On the other hand, buffer stocks are, as the term indicates, intended to ease sharp fluctuations in prices. Some commercial stocks, including the London Metal Exchange (LME) and the New York Commodity Exchange (COMEX) have been set up by the producer countries; and an example of a buffer stock is the Bufferstock of International Tin Council. Generally, these reserves are built up by purchasing when prices are low and are used when prices exceed a certain ceiling. Although the price difference generates a new marketing rent, this could be cancelled out by the costs of maintaining the stock. Some developed countries, such as the United States, Japan, the Federal Republic of Germany and France, which are heavily dependent on supplies of some metals, have established strategic reserves in order to reduce this dependence to some degree. These reserves have, however, been used on a number of occasions as buffer stocks or special commercial stocks.60/ During 1979, the Federal Emergencies Management Agency (FEMA) was established in the United States; this agency was started by officials formally responsible for the Civil Defence Preparatives Agency, the Federal Administration for Disaster Relief and the General Services Administration and also consolidated the three existing national reserves in a single unit with an estimated value of US$ 14 billion. FEMA redefined federal policy on strategic reserves, and in May 1980 set new goals for inventories without drawing up a programme of purchases, which may be

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60/ See ESCAP, E/ESCAP/NR.6/18.

/concentrated in

concentrated in the period 1982-1984. The volume of stocks envisaged in these goals is greater than that of the stocks accumulated up to September 1979 in the case of the following metals: aluminium, bauxite, bismuth, cadmium, copper, nickel, lead, tantalum and tungsten. On the other hand, stocks of the following metals will have to be sold in order to reduce them to the level of the goal adopted: antinomy, tin, manganese and silver (see table 33).

81. No data is available for purposes of calculating the distribution of mineral rent among producer countries, consumer countries and transnational corporations, and only very rough estimates have been made for the whole economy of the various earnings transferred abroad during the period 1960-1977. These figures appear in table 34 under the following headings: net remuneration of factors of production, terms-of-trade effect and other revenue. Other revenue is calculated on the basis of variations in the purchasing power of exports after the net remuneration of the factors of production and the terms-of-trade effect have been deducted. In this table, countries are listed in descending order by share of mineral exports in total exports (see table 6). The group in which this share is higher than 18% comprises Chile, Bolivia, Jamaica, Guyana, Peru and the Dominican Republic. The group with a 1% to 9% share includes Brazil, Honduras, Mexico, Venezuela, Argentina and Nicaragua, leaving Colombia and Ecuador with a smaller share. In absolute terms, the largest transfers by net outlay to factors of production were made by Mexico, Brazil, Venezuela, Argentina, Chile, Peru and Colombia. In Venezuela and Argentina, the transfers were compensated by a favourable evolution in the terms of trade. Conversely, transfers effected by Chile and Brazil increased. All the mineral-exporting countries in the first group, with the exception of Guyana, had adverse terms of trade. All the countries in the second and third groups, with the exception of Brazil, showed a positive evolution in their terms of trade, which may be attributed to the fact that the relative prices of minerals evolved very unfavourably during this period. Other transfers, including unrecorded exports or movements of capital evolved favourably in all the countries, with the exception of Venezuela, Guyana and Honduras. In the mineral-exporting countries, with the exception of Guyana, total transfers to the exterior were high in absolute terms. In the second and third group they were also

/Table 33

Table 33

WORLD METAL INVENTORY

(Thousands of tons)

Commodity	Inventories		Strategic reserves of the United States		World consumption 1976-1977
	Commercial stocks	Buffer stocks	Stocks in September 1979	Net approved a/	
Aluminium	-	-	3 124	6 485	17 922
Antimony	6	6	37	33	...
Bauxite	-	-	178	1 422	...
Bismuth b/	-	-	945	999	...
Cadmium b/	-	0.5	2 873	5 312	...
Copper	59	283	26	907	8 771
Tin	18	-	181	38	181
Manganese	508	453	1 787	1 360	...
Nickel	-	204	-	181	658
Silver b/	-	-	4 339	-	...
Lead	172	148	545	998	4 361
Tantalium b/	-	-	1 086	3 251	...
Tungsten b/	-	-	23 002	39 522	...

Source: OAS/CECON, Boletín comercial, Vol. V, Nº 5, May 1980. See table 13 of the Statistical Annex and ESCAP, E/ESCAP/NR.6/18, 1979.

a/ Approved by the Federal Emergency Management Agency in May 1980.

b/ Tons.

/Table 34

Table 34

LATIN AMERICA: RENTS TAPPED FROM THE EXTERIOR, CUMULATIVE FOR THE PERIOD 1960-1977

(Millions of dollars at current prices)

Country a/	Net remuneration of factors of production	Terms-of-trade effect	Other rent b/	Total rent tapped from the exterior	Total rent tapped from the exterior as a percentage	
					Total exports	Net inflow of capital
Chile	3 183	6 001	-1 059	8 125	37.7	463.8
Bolivia	369	417	-112	674	14.6	23.9
Jamaica	1 448	109	-401	1 156	11.6	64.8
Guyana	304	-196	48	156	5.1	31.1
Peru	2 782	2 764	-855	4 691	23.4	85.9
Dominican Republic	755	315	-352	718	10.7	42.4
Brazil	12 523	5 845	-2 209	16 159	21.0	40.1
Honduras	366	-440	35	-39	-	-4.0
Mexico	14 354	-	-680	13 674	22.3	64.7
Venezuela	9 562	-36 519	23 304	-3 653	-4.4	140.1
Argentina	4 150	-4 093	-42	15	-	0.5
Nicaragua	539	-441	-14	84	1.8	6.7
Colombia	2 641	-218	-205	2 218	10.1	56.6
Ecuador	1 294	-545	-18	731	8.4	34.4

Source: See tables 4, 18 and 19 of the Statistical Annex.

a/ Countries are listed by order of magnitude of the share of mineral exports in total exports.

b/ Net purchasing power of exports: ratio between net exports of remuneration of factors of production and net imports of external financing, deflated by the terms of trade.

/high in

high in the cases of Brazil, Mexico and Colombia. The only cases where transfers towards the country were positive were those of Venezuela and Honduras due to the increase in the price of hydrocarbons in the first instance and, possibly, to capital inflows on concessional terms in the second. In relative terms, the highest indexes of transfers to the exterior where exports were concerned were achieved by Chile, Peru, Mexico, Brazil, Bolivia, Jamaica and the Dominican Republic (see table 34); in other words, if Mexico and Brazil are excluded, the highest coefficients were achieved by the mineral-exporting countries, with the exception of Guyana. The ratio of net transfers abroad to net capital inflows is also high in four mineral-exporting countries - Chile, Peru, Jamaica and the Dominican Republic; in two countries in the second group - Venezuela and Mexico - and in one country in the third group - Colombia (see table 34).

IV. INVESTMENT REQUIREMENTS AND HORIZONTAL CO-OPERATION

82. Complete statistics are not available on investments in the mining sector, making it necessary to rely on estimates which give an idea of the order of magnitude of investments. A study indicates that during the period 1976-1980, annual world investments in nine minerals alone, excluding those made in countries with centrally planned economies, rose by close to US$ 15 billion, 53% of which was invested in developing countries with external financing amounting to about 60%.61/ It must however be borne in mind that 43% of the value of mineral production was achieved by countries with centrally planned economies, and, on the assumption that the percentage of investment is similar to that of production, it could be estimated that the annual world investment during this period was over US$ 28 billion for these nine minerals. Other estimates in other studies 62/ showed that accumulated capital in the mining sector would amount to close US$ 270 billion in 1980. Discounting the 3% for depreciation, an investment of US$ 28 billion would constitute a net addition to the capital accumulation of about 7.0%, a rate which would seem to be very close to the real situation. On the basis of these criteria, it has been estimated that the annual investment in the mining sector in Latin America was close to US$ 7 billion during the period 1976-1980, or 25% of the world investment in 1975 constant prices (see table 35).

83. On the basis of the data supplied above, production projections and costs per ton of metal, different estimates have been made of future investment requirements at world level:

(a) A group of experts has estimated that to maintain the historic long-term rate of growth of the mining sector in the market economies, an annual investment of US$ 15 billion would be needed during the period 1980-1990, which would reflect a negative growth rate by comparison with the period 1976-1980.63/

61/ See Takeuchi.

62/ See Leontief.

63/ Centre for Economic and Social Information/OPI.

/Table 35

Table 35

PROJECTION OF INVESTMENT NEEDS a/

(Millions of 1975 dollars)

Commodity	Annual average, 1976-1980			Projection a/			
	Mines and concentration	Smelting and refining	Total	Mines and concentration	Smelting and refining	Total	Annual growth rate 1980-2000
Latin America							
Copper	2 467	1 781	4 248	21 235	17 679	38 914	11.7
Iron	426	86	512	2 583	1 944	4 527	11.5
Zinc	258	86	344	861	813	1 674	8.2
Bauxite	419	32	451	2 152	1 713	3 865	11.3
Nickel	119	-	119	622	660	1 282	12.6
Tin	193	102	295	765	1 016	1 781	9.4
Lead	126	89	215	430	457	887	7.3
Others	453	242	695	6 300	5 307	11 607	15.1
Total	4 461	2 418	6 879	34 948	29 589	64 537	11.8
World total	13 575	12 039	25 614	70 000	52 650	122 650	8.2

Source: See Economic and Social Information Centre/OPI; Cacko; Takeuchi; Mikesell, Bossio; and Leontief and table 25 of the text.

a/ This projection is intended merely to illustrate the potential absorption capacity of the mining sector and does not therefore have the weight of an investment target proposal.

/(b) Projections

(b) Projections for five products (bauxite, copper, iron, nickel and tin) show an annual investment of US$ 12.5 billion during the period 1977-2000, 44% of which would be invested in developing countries, with external financing of 75%. Considering that the production value of those commodities represented 79% of world mineral production, it may be estimated that the world investment will amount to close to US$ 16 billion on average during that period.64/

(c) Annual investment in nine products (copper, lead, zinc, bauxite, iron, phosphate rock, tin, nickel and manganese) made in the market-economy countries during the period 1981-1985 has been estimated at US$ 21 billion, 54% of which would be invested in developing countries with external financing of 64%. Considering that these nine products represent 89.9% of the value of world production of minerals and that countries with centrally planned economies produced 43% of that amount, the total invested would be expected to amount to US$ 54.3 billion.65/

(d) An annual growth rate of capital accumulation of 5.6% has been projected for the period 1980-2000. The capital of the mineral sector, with hydrocarbons left out of consideration, is expected to grow at an annual rate of 8.2%, with the following differences by groups of countries: 7.0% in developed countries, 7.6% in countries with centrally planned economies and 10.4% in developing countries. To achieve these growth rates, the world investment in this sector must average up to close to US$ 123 billion annually during this period. Of this investment, 57% would be directed towards mineral extraction and concentration activities with an annual growth rate of 8.6% and the remaining 43% to the smelting and refining of metal, with an annual rate of 7.7%.66/

84. On the basis of the projections referred to above and the likely participation of Latin America in the production process (see table 26), potential absorption of investment in the year 2000 has been estimated at over US$ 64 billion with a growth rate of 11.8%, 54% of which would be accounted for by mineral extraction and concentration and the rest by the

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64/ See Mikesell.

65/ See Takeuchi.

66/ See Leontief.

smelting and refining of metal. The annual growth rates of investment in the leading minerals would fluctuate between 7.3% for lead and 12.6% for nickel (see table 35). It is possible that 50 to 60% of this investment would have to be financed with resources from the exterior, which would exceed the possibilities of the multilateral financing institutions. It must be borne in mind that these projections reflect only Latin America's potential with respect to capacity to absorb mining investments calculated on the basis of the relative magnitude of its reserves and must not be taken as a possible growth target since in calculating it, consideration has not, for example, been given to the possible impact of the production of secondary metal, deep-sea nodules and non-metallic substitutes, which must be estimated in a fuller analysis at product level.

85. To be more specific, it should be borne in mind that during the period 1978-1979, over a hundred large-scale projects and hundreds of medium and small-scale projects were initiated. A third of the large-scale projects are open-pit projects, with relatively low extraction costs, and investments ranging from between US$ 100 million and 2 billion are envisaged.67/ The aim of these projects is to increase the production of the following minerals and metals primarily: copper, lead, zinc, tin, iron, bauxite, nickel, molybdenum, uranium, silver, gold, tungsten, phosphates and asbestos (see table 36). An inventory of projects under study drawn up by the Inter-American Development Bank for the period 1981-1985 indicates that about US$ 40 billion is expected to be invested in the mining sector in Latin America, over 80% of which would have to be financed with external resources. It must be borne in mind that 90% of the investments covered by this inventory are concentrated in Brazil, Peru, Argentina and Mexico and that 70% of the minerals produced consists of bauxite, copper, iron, nickel and phosphates. Other studies, based on the future evolution of international demand and on the assumption that Latin America will increase its share in world investment, presuppose an investment of US$ 22 billion, with an external resources requirement of 70% (see table 37).

67/ See Salas.

/Table 36

Table 36

PARTIAL LIST OF LARGE-SCALE PROJECTS INITIATED IN THE PERIOD 1978-1979

Country	Number of projects	Main products
Argentina	3	Copper, molybdenum, uranium
Bolivia	14	Lead, silver, copper, zinc, tin, iron, phosphates, uranium and tungsten
Brazil	37	Copper, zinc, lead, iron, aluminium, nickel, uranium, phosphates
Colombia	2	Ferro-nickel and asbestos
Costa Rica	2	Gold and silver and aluminium
Cuba	1	Nickel
Chile	8	Copper, gold and silver
Ecuador	1	Lead and zinc
Guatemala	1	Copper, gold and silver
Guyana	1	Aluminium
Honduras	1	Copper
Jamaica	1	Gold and silver
Mexico	14	Expansion of present production
Panama	3	Copper
Paraguay	1	Aluminium
Peru	14	Expansion of present production, copper and zinc
Dominican Republic	1	Gold and silver
Suriname	1	Aluminium
Venezuela	6	Gold, zinc-lead-copper, aluminium

Source: See Salas.

/Table 37

Table 37

WORLD MINING[a]: INVESTMENT IN NEW PROJECTS AND PROGRAMMES FOR EXPANSION IN THE 1980s

	Millions of dollars	Percentages
Latin America		
Aluminium	5 040	22.5
Copper	11 548	51.5
Tin	68	0.3
Iron ore	2 620	11.7
Silver	160	0.7
Lead	206	0.9
Nickel	560	2.5
Zinc	830	3.7
Other minerals	1 390	6.2
Total	22 422	100.0
Argentina	1 500	6.7
Bolivia	458	2.0
Brazil	7 325	32.7
Colombia	1 900	8.5
Chile	4 166	18.6
Ecuador	5	-
Guatemala	260	1.2
Guyana	500	2.2
Honduras	15	0.1
Jamaica	450	2.0
Mexico	1 348	6.0
Peru	3 555	15.9
Venezuela	940	4.2
Total Latin America	22 422	100.0
Developed countries	27 711.6	39.8
North America	9 679.0	15.6
Canada	5 203.5	8.4
United States	4 475.5	7.2
Western Europe	2 614.5	4.3
Spain	805.9	1.3
France	31.0	0.1
Greece	265.8	0.4
Netherlands	18.6	-
Ireland	814.2	1.3
Italy	31.0	0.1
Norway	279.2	0.5
Portugal	150.0	0.2
United Kingdom	72.1	0.1
Germany, Federal Republic of	113.6	0.2
Sweden	33.1	0.1
Australia	9 079.9	14.6
New Zealand	268.1	0.4
South Africa	3 070.1	4.9
Developing countries	37 412.6	60.2
Africa	5 638.7	9.1
Latin America	22 422.0	36.1
Asia	7 840.3	12.6
South Pacific [b]	1 511.6	2.4
Total	62 124.2	100.0

/Table 37 (Concl.)

Table 37 (conclusion)

	Alumi-nium	Copper	Tin	Iron ore	Silver	Lead	Nickel	Zinc	Other minerals	Total
				Millions of dollars						
Argentina	-	1 000	-	-	-	-	-	-	500	1 500
Bolivia	-	-	68	-	-	165	-	225	-	458
Brazil	3 280	1 035	-	2 620	-	-	-	-	390	7 325
Colombia	-	1 600	-	-	-	-	300	-	-	1 900
Chile	-	4 166	-	-	-	-	-	-	-	4 166
Ecuador	-	5	-	-	-	-	-	-	-	5
Guatemala	-	-	-	-	-	-	260	-	-	260
Guyana	500	-	-	-	-	-	-	-	-	500
Honduras	-	-	-	-	-	-	-	-	15	15
Jamaica	450	-	-	-	-	-	-	-	-	450
Mexico	-	753	-	-	150	-	-	260	185	1 348
Peru	-	2 989	-	-	10	41	-	215	300	3 555
Venezuela	810	-	-	-	-	-	-	130	-	940
Total Latin America	5 040	11 548	68	2 620	160	206	560	830	1 390	22 422
				Percentages						
Argentina	-	8.7	-	-	-	-	-	-	36.0	6.7
Bolivia	-	-	100.0	-	-	80.1	-	27.1	-	2.0
Brazil	65.1	9.0	-	-	-	-	-	-	28.0	32.7
Colombia	-	13.9	-	-	-	-	53.6	-	-	8.5
Chile	-	36.1	-	-	-	-	-	-	-	18.6
Ecuador	-	-	-	-	-	-	-	-	-	-
Guatemala	-	-	-	-	-	-	46.4	-	-	1.2
Guyana	9.9	-	-	-	-	-	-	-	-	2.2
Honduras	-	-	-	-	-	-	-	-	1.1	0.1
Jamaica	8.9	-	-	-	-	-	-	-	-	2.0
Mexico	-	6.5	-	-	93.8	-	-	31.3	13.3	6.0
Peru	-	25.9	-	-	6.2	19.9	-	25.9	21.6	15.9
Venezuela	16.1	-	-	-	-	-	-	15.7	-	4.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Mining Journal, Mining Magazine, January 1981.

a/ Excluding the Socialist countries.

b/ Including New Caledonia and Papua New Guinea.

86. It is estimated that during the next decade the developing countries will require an annual investment of over US$ 650 million at 1977 prices for prospecting activities - a figure which is higher than the 1978 investment by 300%.68/ The United Nations Revolving Fund for Natural Resources Exploration was financed with contributions from only ten countries: Belgium, Canada, the United States, Indonesia, Italy, Iraq, Japan, the Netherlands, Panama and the Dominican Republic. These countries pledged a total of nearly US$ 27 million with an actual disbursement of US$ 26 million. Since the Fund was initiated, 14 projects totalling US$ 27 million have been approved, 11 others totalling US$ 23 million are in the process of being approved, and another 18 are in the pipeline, which would exceed the Fund's resources.69/

87. In 1976, the World Bank approved the new technical and financial assistance programme with regard to the implementation of mining sector projects in the developing countries. The central aim of the programme is to ensure that the Bank plays a leading role in the promotion of mixed projects, which on average would have the following financial structure: World Bank resources: 15%, resources of developing producing countries: 19%, resources from developed countries: 66%. The Bank is to provide close to US$ 15 billion up to the year 1985 to finance from 2 to 6 projects a year.70/

88. In May 1976 at the fourth session of UNCTAD, resolution 93 on the integrated programme for commodities (IPC) was adopted. This programme covers 18 commodities including the following minerals: bauxite, tin, phosphates, manganese and iron; the resolution also specifies that the list may be applied to other commodities if certain procedures provided for in the programme itself are applied.71/ Among the measures suggested for adoption was the establishment of a common fund, which was agreed upon in August 1980 when two windows began to operate. The first window, which has 400 million dollars available to it, will serve as a stabilization facility and to

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68/ See United Nations, E/C.7/96 and DP/537.

69/ See UNDP, DP/368.

70/ See Mikesell.

71/ See Corea.

/improve the

improve the bargaining power of developing countries. The second window, with 350 million dollars, will be used to finance research work and investment projects up to the pilot project level.

89. The factors mentioned above would mean that the larger share of Latin America's investment needs would be financed with external resources derived, perhaps, from sources as diverse as commercial banks, suppliers of machinery, transnational corporations which play a role in the mining production and marketing process, consumer countries, petroleum-exporting countries, international agencies and stock exchanges, so that the bargaining power of the countries of the region should increase substantially with regard to marketing and participation in the distribution of mineral rent and also because the sector will be adequately financed, these being two sides of the same coin.

90. Although only a small number of horizontal co-operation projects now exist in the region, the issues examined in this study demonstrate the need for solidarity among the Latin American countries in achieving the following basic objectives:

(a) To improve the capacity to negotiate for greater participation in trade and in mineral rent. The main action for achieving this purpose might consist in:

(i) Studies on markets, marketing, transport, terms of sales contracts, production processes, sources of financing, mining legislation, etc.

(ii) Exchange of information and agreement among producers in order to identify production and marketing policies of the region.

(iii) Regional use of resources from the Common Fund for the stabilization of income and the development of commodities.

(b) To attract financial resources for mineral prospecting and exploration by identifying large areas or strips of land containing potential mineral resources with a view to their joint exploitation by two or more countries.

(c) To achieve greater industrial complementarity and integration of the mining-metallurgical base so as to take advantage of economies of scale and to expand national markets.

/Other studies

Other studies 72/ point out that in future the greatest opportunities to expand horizontal co-operation may lie in the following:

(a) Co-operation in geological data collecting, exchange and comparison.

(b) Resources exploration, development and exploitation by the implementation of joint-venture projects or agreements on the provision of technical advisory services.

(c) Establishment of subregional and regional plants engaged in processing in the mining and metallurgy sector.

(d) Subregional or regional manufacture of equipment, machinery and other inputs used in mining production.

(e) Joint construction of infrastructure works.

(f) Co-operation in the strengthening of institutions.

(g) Participation of countries with commercial surpluses in the financing of mining projects.

(h) Establishment of Latin American multinational corporations for production, marketing and transport.

(i) Production of capital goods.

(j) Integral planning for promoting larger investment.

(k) Formation of subregional or regional companies providing technical services.

Finally, it should be noted that there will obviously be a need to make a special effort to achieve regional awareness of mining development so that the required policies, plans and projects can be formulated and suitable machinery can be established for their implementation.

72/ See Magloire.

V. CONCLUSIONS

91. Latin America has sufficient known and potential resources to maintain and raise both the levels of its output and its exports. For that purpose it could eventually require amounts of annual investment exceeding US$ 60 000 million by the year 2000.

92. However, the current structure of the international market for metals and the way in which it operates are satisfactory neither for the consumer countries nor for the producer countries, and the two groups are taking measures to restructure that market and give it a new focus. On the one hand, the basic purpose of concentrating investment on prospection, exploring marine resources, increasing output of secondary metal and substitutes and establishing strategic reserves is to increase the developed countries' level of self-sufficiency. On the other hand, the developing countries are stepping up integration of their output and marketing, concluding agreements in order to establish producers' and exporters' associations at the interregional level, with a view to obtaining a greater share of international trade and mining revenue.

93. However, it will be necessary to undertake greater efforts not only to attain the objective of increasing the bargaining power of the countries of the region - basically through a reduction in output costs and a greater degree of industrial processing of products - but also in order to promote the process of producing manufactured goods on the basis of various metals, which account for over 40% of Latin American imports.

94. The basic requirements for achieving that goal are that there should be extensive consumer markets for each end product and that the financing and technology required for producing such products at competitive prices should be available; in turn, these requirements call for the following:

(a) Greater knowledge of the region's mineral potential.

(b) Greater knowledge of the potential of, and the future development of, the international market.

(c) Agreements on costs and prices.

(d) Integration and industrial complementation of mining and metallurgical activities.

/(e) Preparation

(e) Preparation of an integrated programme of technological research.

(f) A concerted effort to achieve basic legislative agreements concerning a more appropriate form of bargaining with financial institutions, suppliers of machinery and technology, and transnational corporations that produce, market and consume minerals and metals, and analysis of conflict areas that are currently arising from agreements with such bodies.

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STATISTICAL ANNEX

Table 1

LATIN AMERICA: TOTAL GROSS DOMESTIC PRODUCT AND GROSS DOMESTIC PRODUCT OF THE MINES AND QUARRIES SECTOR[a/]

(Millions of monetary units of each country at 1970 prices)

Country	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Argentina																				
Total GDP	55 428.3	59 377.2	58 415.3	57 015.7	62 914.0	68 662.5	69 092.9	70 956.7	73 979.5	80 323.2	84 623.7	89 616.5	93 027.8	97 408.9	103 364.7	102 467.7	10 717.7	105 693.5	102 060.4	110 697.7
Mines and quarries GDP	739.4	966.9	1 088.5	1 085.7	1 105.1	1 146.9	1 210.2	1 356.4	1 524.1	1 673.9	1 787.6	1 852.4	1 894.9	1 821.4	1 874.7	1 789.0	1 820.7	1 993.5	2 008.6	2 095.0
Percentage mining GDP/ total GDP	1.3	1.6	1.9	1.9	1.7	1.7	1.7	1.9	2.1	2.1	2.1	2.1	2.0	1.9	1.8	1.7	1.8	1.9	2.0	1.9
Bolivia																				
Total GDP	6 685.0	6 824.6	7 205.4	7 668.4	8 037.6	8 432.6	9 042.4	9 608.0	10 427.7	10 894.2	11 464.0	12 030.5	12 741.9	13 623.0	14 457.2	15 216.2	16 244.9	16 902.2	17 461.4	17 723.6
Mining GDP	427.8	440.4	457.1	512.9	539.3	533.9	622.2	773.5	803.8	855.9	900.0	955.1	1 046.3	1 302.2	1 240.0	1 051.3	1 168.0	1 139.0	1 057.7	973.6
Percentage mining GDP/ total GDP	6.4	6.4	6.3	6.7	6.7	6.3	6.9	8.0	7.7	7.8	7.8	7.9	8.2	9.5	8.6	6.9	7.2	6.7	6.0	5.5
Brazil																				
Total GDP	98 425.7	108 568.3	114 261.3	116 033.7	119 429.7	122 685.2	127 299.9	133 513.5	148 427.7	163 164.4	177 545.6	201 160.6	224 775.4	256 025.2	281 057.1	297 037.3	323 664.1	338 755.8	359 173.2	382 160.1
Mining GDP	494.9	525.3	533.9	629.4	707.6	855.2	972.4	994.1	1 150.3	1 289.3	1 506.3	1 562.7	1 732.0	1 944.7	2 760.8	2 943.1	2 989.2	2 830.3	3 003.9	3 299.1
Percentage mining GDP/ total GDP	0.5	0.5	0.5	0.5	0.6	0.7	0.8	0.7	0.8	0.8	0.8	0.8	0.8	0.7	1.0	1.0	0.9	0.8	0.8	0.9
Colombia																				
Total GDP	72 279.1	75 917.3	79 990.6	82 587.6	87 598.1	90 669.9	95 429.0	99 414.3	105 696.6	112 380.7	119 796.8	126 721.7	136 743.1	147 177.7	156 707.1	163 398.7	170 226.7	178 219.6	193 903.0	204 091.0
Mining GDP	1 923.1	1 798.4	1 792.0	2 015.8	2 180.5	2 342.0	2 252.3	2 267.3	2 196.9	2 593.2	2 528.0	2 550.8	2 379.9	2 591.6	2 403.7	2 240.6	2 145.6	2 063.6	2 153.9	2 122.0
Percentage mining GDP/ total GDP	2.7	2.4	2.2	2.4	2.5	2.6	2.4	2.3	2.1	2.3	2.1	2.0	1.7	1.8	1.5	1.4	1.3	1.1	1.1	1.0
Costa Rica																				
Total GDP	3 222.0	3 191.2	3 451.2	3 616.2	3 766.4	4 136.6	4 462.1	4 714.2	5 113.7	5 394.6	5 799.3	6 192.4	6 698.8	7 215.3	7 615.4	7 775.2	8 204.4	8 934.8	9 447.1	9 853.3
Mining GDP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Percentage mining GDP/ total GDP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chile																				
Total GDP	55 951.8	59 360.2	62 106.4	65 263.9	68 066.6	71 506.2	76 516.3	78 380.9	80 733.8	83 529.1	86 541.1	93 196.1	93 115.9	89 744.6	94 824.6	84 119.9	87 566.9	95 097.7	102 516.7	111 228.1
Mining GDP	6 212.2	6 553.1	6 938.6	7 428.5	7 934.8	7 943.1	8 719.2	8 648.1	8 881.4	10 001.7	10 101.0	10 302.9	10 087.8	10 253.2	11 886.5	11 299.1	12 940.7	13 205.4	13 165.7	13 554.7
Percentage mining GDP/ total GDP	11.1	11.0	11.2	11.4	11.6	11.1	11.3	11.1	11.0	12.0	11.7	11.0	10.8	11.4	12.5	13.4	14.8	13.9	12.8	12.2
Ecuador																				
Total GDP	18 335.6	18 797.7	19 796.1	20 301.1	21 731.7	23 824.1	24 448.9	25 742.5	27 167.4	28 652.3	30 662.0	31 892.9	34 429.9	40 580.2	42 205.5	45 375.4	49 042.6	52 181.3	54 999.3	57 969.2
Mining GDP	242.3	233.8	236.9	257.1	262.6	251.7	254.8	268.1	245.5	274.3	300.0	343.4	1 371.8	3 971.8	3 292.0	3 128.1	3 542.6	3 300.7	3 624.7	3 830.6
Percentage mining GDP/ total GDP	1.3	1.2	1.2	1.3	1.2	1.1	1.0	1.0	0.9	0.9	1.0	1.1	4.0	9.8	7.8	6.9	7.2	6.3	6.6	6.6
El Salvador																				
Total GDP	1 372.0	1 420.3	1 590.1	1 658.6	1 813.3	1 910.7	2 047.5	2 158.8	2 220.7	2 306.4	2 375.1	2 489.4	2 625.4	2 758.2	2 935.5	3 098.7	3 221.8	3 410.4	3 560.5	3 450.1
Mining GDP	3.1	2.9	2.6	2.8	2.8	3.5	3.7	4.0	3.4	3.7	4.2	4.1	4.6	4.8	5.8	5.3	4.7	4.3	3.8	4.0
Percentage mining GDP/ total GDP	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1
Guatemala																				
Total GDP	1 041.1	1 085.8	1 124.2	1 231.4	1 288.4	1 344.6	1 418.9	1 477.1	1 606.7	1 682.6	1 778.9	1 878.1	2 016.0	2 152.7	2 290.1	2 334.4	2 506.9	2 702.7	2 852.3	2 994.9
Mining GDP	1.9	2.4	1.5	1.6	1.6	1.6	1.8	1.8	1.3	1.4	1.7	1.7	1.5	1.6	2.0	2.1	2.7	3.1	5.6	7.1
Percentage mining GDP/ total GDP	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2

Table 1 (concluded)

Country	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Haiti																				
Total GDP	1 929.5	1 851.1	2 028.4	1 897.0	1 853.7	1 873.7	1 862.5	1 824.8	1 896.7	1 958.9	2 051.0	2 184.3	2 261.9	2 368.6	2 466.4	2 520.6	2 654.3	2 688.7	2 793.6	2 846.7
Mining GDP	96.6	98.5	33.1	32.8	31.5	27.4	26.0	23.1	26.0	39.9	35.0	41.2	35.3	45.9	47.8	31.7	42.6	40.7	36.6	36.6
Percentage mining GDP/ total GDP	5.0	5.3	1.6	1.7	1.7	1.5	1.4	1.3	1.4	2.0	1.7	1.9	1.6	1.9	1.9	1.3	1.6	1.5	1.3	1.3
Honduras																				
Total GDP	804.0	831.9	878.9	909.2	958.4	1 058.1	1 125.3	1 179.0	1 262.0	1 265.3	1 291.0	1 353.7	1 406.3	1 471.3	1 471.3	1 443.2	1 531.7	1 619.8	1 747.4	1 836.5
Mining GDP	13.9	13.9	16.1	16.1	17.2	19.6	21.9	25.4	26.5	25.4	30.0	27.7	30.0	39.3	51.9	38.1	32.3	51.2	32.3	33.2
Percentage mining GDP/ total GDP	1.7	1.7	1.8	1.8	1.8	1.8	1.9	2.1	2.1	2.0	2.3	2.0	2.1	2.7	3.5	2.6	2.1	1.9	1.8	1.8
Mexico																				
Total GDP	202 483.4	212 465.9	222 392.3	240 158.1	268 240.6	285 635.6	305 434.9	324 584.1	350 991.2	373 187.9	399 017.8	412 740.2	442 739.9	476 372.6	504 489.6	525 072.7	536 238.7	553 727.2	592 741.7	640 160.9
Mining GDP	8 589.3	9 250.1	9 847.0	10 395.4	11 121.4	11 451.1	11 952.2	13 323.7	14 258.0	14 927.8	16 184.2	16 513.8	17 583.1	18 119.1	20 717.0	21 482.2	23 254.1	26 486.6	29 327.2	32 990.5
Percentage mining GDP/ total GDP	4.2	4.3	4.4	4.3	4.1	4.0	3.9	4.1	4.1	4.0	4.0	4.0	3.9	3.8	4.1	4.1	4.3	4.8	4.9	5.1
Nicaragua																				
Total GDP	2 553.1	2 744.3	3 043.3	3 373.9	3 768.7	4 127.6	4 263.8	4 561.0	4 622.3	4 930.1	4 977.1	5 222.5	5 388.6	5 662.8	6 382.4	6 522.6	6 851.6	7 282.0	6 761.1	5 084.3
Mining GDP	29.5	33.0	48.5	45.9	45.7	45.8	49.3	51.4	45.1	37.8	33.6	32.2	27.3	30.6	38.4	26.9	18.6	17.9	13.9	17.7
Percentage mining GDP/ total GDP	1.1	1.2	1.6	1.4	1.2	1.1	1.1	1.1	1.0	0.8	0.7	0.6	0.5	0.5	0.6	0.4	0.3	0.2	0.2	0.3
Panama																				
Total GDP	452.3	501.1	543.1	594.3	619.9	674.3	724.4	784.9	842.1	907.6	962.3	1 040.4	1 095.2	1 162.2	1 171.3	1 177.9	1 165.6	1 204.2	1 250.0	1 311.3
Mining GDP	1.2	1.3	1.6	2.0	2.0	1.8	2.1	2.2	2.3	2.6	2.5	2.8	2.9	4.0	3.8	3.6	3.2	3.5	3.0	3.2
Percentage mining GDP/ total GDP	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2
Paraguay																				
Total GDP	44 477.4	46 595.5	49 870.4	51 233.3	53 461.3	56 504.8	57 146.3	60 771.8	62 939.7	65 382.4	69 435.4	72 478.2	76 205.1	82 182.1	88 986.2	93 460.3	100 484.7	112 349.1	123 913.8	135 070.6
Mining GDP	72.3	61.1	49.4	94.5	118.2	118.3	211.9	172.4	61.0	67.5	82.8	188.3	209.0	197.1	225.7	285.9	404.1	501.6	575.8	818.1
Percentage mining GDP/ total GDP	0.2	0.1	0.1	0.2	0.2	0.2	0.4	0.3	0.1	0.1	0.1	0.2	0.3	0.2	0.2	0.3	0.4	0.4	0.5	0.6
Peru																				
Total GDP	150 574.4	161 094.1	174 253.1	181 478.8	194 803.2	204 855.4	217 998.4	225 218.3	224 746.1	233 427.6	245 066.0	258 446.2	262 748.5	273 954.9	294 454.1	307 811.4	314 032.2	313 917.7	311 831.8	329 681.4
Mining GDP	11 851.0	12 956.8	12 325.8	13 113.7	13 767.8	13 970.4	15 339.2	15 517.2	16 479.5	16 370.4	17 536.0	17 443.1	18 776.1	18 938.6	19 644.1	17 756.2	18 824.6	22 879.1	25 360.7	28 327.9
Percentage mining GDP/ total GDP	7.9	8.0	7.1	7.2	7.1	6.8	7.0	6.9	7.3	7.0	7.1	6.7	7.1	6.9	6.7	5.8	6.0	7.3	8.1	8.7
Dominican Republic																				
Total GDP	807.8	789.6	924.0	984.4	1 050.1	919.5	1 042.8	1 077.9	1 080.1	1 198.3	1 325.3	1 469.3	1 622.1	1 831.2	1 941.3	2 042.1	2 179.5	2 299.1	2 352.5	2 457.2
Mining GDP	15.2	16.0	13.7	13.6	15.3	15.2	15.0	19.5	18.6	21.3	22.7	23.4	63.2	100.0	109.8	121.5	146.6	144.8	116.9	144.9
Percentage mining GDP/ total GDP	1.9	2.0	1.5	1.4	1.4	1.6	1.4	1.8	1.7	1.8	1.7	1.6	3.9	5.5	5.6	5.9	6.7	6.3	5.0	5.9
Uruguay																				
Total GDP	455 890.0	468 948.6	458 392.9	460 641.9	469 891.7	475 296.6	491 510.9	471 125.1	478 633.7	507 834.2	531 629.9	526 442.7	508 091.8	511 980.4	528 115.0	551 631.4	566 093.7	585 083.2	608 113.4	659 194.2
Mining GDP	7 434.6	3 817.8	3 348.9	2 478.2	3 148.0	3 482.9	3 081.0	3 616.9	5 224.3	7 032.8	6 296.0	6 697.9	-	-	-	-	-	-	-	-
Percentage mining GDP/ total GDP	1.6	0.8	0.7	0.5	0.7	0.7	0.6	0.8	1.1	1.4	1.2	1.3	-	-	-	-	-	-	-	-
Venezuela																				
Total GDP	27 633.4	29 022.6	31 674.8	33 856.2	37 143.4	39 342.2	40 245.5	41 869.4	44 093.7	46 057.7	49 331.0	50 976.9	52 512.9	56 028.2	59 304.0	62 384.1	67 240.7	72 365.9	75 854.2	78 964.2
Mining GDP	7 596.9	7 627.4	8 286.6	8 340.2	8 856.9	9 073.9	8 824.0	9 227.4	9 348.0	9 373.6	9 816.0	9 192.1	8 501.1	9 149.4	8 072.1	6 517.2	6 290.8	5 930.7	5 778.8	6 333.5
Percentage mining GDP/ total GDP	27.5	26.3	26.2	24.6	23.8	23.1	21.9	22.0	21.2	20.3	19.9	18.0	16.2	16.3	13.6	10.4	9.3	8.3	7.6	8.0

Source: CEPAL, on the basis of official data.

a/ Including extraction of hydrocarbons.

Table 1 (annex)

LATIN AMERICA[a/] (SIX COUNTRIES): PERCENTAGE OF THE PETROLEUM EXTRACTION SUBSECTOR WITH REGARD TO TOTAL MINING GDP

Country	1969	1970	1971	1972	1973	1974	1975	1976	1977
Argentina	67	69	70	69	70	68	69	68	66
Bolivia	...	9	17	21	23	21	20	...	...
Colombia	78	81	83	81	76	...	...	...	...
Ecuador	...	12	10	75	90	93	92	92	92
Mexico	80	82	82	83	82	82	84	85	87
Venezuela	94	93	93	93	92	90	88	89	90

Source: United Nations, Yearbook of National Accounts Statistics, 1978, Volume I, Individual Country Data.

a/ The following petroleum-producing countries are not included: Brazil, Chile, Peru and Trinidad and Tobago.

Table 2

LATIN AMERICA: EXPORTATION OF THE PRINCIPAL METALS

(Thousands of dollars FOB)

	1970	1971	1972	1973	1974	1975	1976	1977
Bauxite/aluminium	315 145	312 246	321 232	337 943	634 788	679 786	577 683	709 470
Argentina	310	275	264	1 644	3 327	246	907	1 673
Brazil	129	257	433	315	1 335	1 913	1 097	1 987
Colombia	216	244	532	841	891	442	895	854
Chile	-	-	-	-	-	195	...	...
Guyana	69 279	68 918	63 290	63 431	89 826	112 531	113 788	129 905
Jamaica	224 272	217 831	235 397	249 962	504 934	536 021	427 540	538 097
Mexico	393	1 563	846	652	1 626	823	1 006	...
Nicaragua	-	-	-	-	-	140	569	867
Peru	-	101	118	172	91	441	233	304
Dominican Republic	15 132	15 983	14 864	14 835	17 756	16 725	15 521	21 983
Venezuela	7 414	7 074	5 488	6 091	15 002	10 309	16 127	13 800*
Copper	1 289 310	901 145	891 140	1 374 877	2 334 864	1 206 159	1 650 425	1 733 768
Argentina	212	115	675	2 064	1 740	292	591	1 022
Bolivia	12 498	8 297	8 762	13 440	16 018	7 263	6 519	4 099
Brazil	1 005	772	2 018	2 522	2 547	1 464	974	2 907
Colombia	547	122	-	-	-	-	310	645
Chile	977 208	687 592	630 697	1 007 167	1 897 959	985 236	1 385 000*	1 317 000*
Ecuador	776	1 104	1 061	1 437	1 286			
Honduras	5 404	5 755	6 776	-	-	-	-	-
Mexico	10 410	15 398	39 505	47 951	30 064	30 143	19 403	26 500*
Nicaragua	3 975	2 643	2 724	-	-	110	87	308
Peru	277 275	179 347	198 922	300 096	385 250	181 651	237 539	381 287
Tin	113 705	111 841	121 370	139 246	257 950	199 833	232 168	352 361
Argentina	2 351	1 897	2 239	2 232	4 585	1 896	410	-
Bolivia	107 032	105 878	113 541	130 993	230 117	171 398	216 329	326 653
Brazil	4 053	3 750	5 287	5 802	21 512	24 137	13 728	22 247
Mexico	-	-	-	-	-	784	-	...
Peru	269	316	303	219	1 736	1 618	1 701	3 461
Iron	700 517	687 539	704 241	931 521	1 430 460	1 628 709	1 867 382	1 756 176
Argentina	28 059	34 808	38 449	110 411	133 429	22 258	89 230	81 191
Brazil	307 227	288 204	314 787	473 352	722 686	1 092 514	1 223 367	1 119 124
Colombia	422	484	1 341	8 617	7 250	3 670	4 520	3 884
Chile	74 841	75 725	58 367	58 990	136 110	118 222	104 400*	104 400*
Ecuador	-	36	-	1	-	-	-	-
Guyana	-	1	2	7	124	1 530	1 146	351
Honduras	-	-	-	218	726	591	714	805
Mexico	29 880	53 831	62 656	28 951	53 647	46 930	56 352	52 300*
Nicaragua	1 125	954	1 463	1 521	1 669	3 109	3 117	4 035
Peru	67 350	62 519	64 950	60 859	75 510	55 779	56 737	86 386
Venezuela	191 613	170 979	162 226	188 594	299 307	284 106	327 799	303 700*

Table 2 (concluded)

	1970	1971	1972	1973	1974	1975	1976	1977
Nickel	-	631	47 013	83 499	93 761	102 430	110 968	91 414
Brazil	-	-	-	-	-	194	-	342
Colombia	-	-	-	-	106	-	-	-
Chile	-	-	-	-	558	39	...	...
Ecuador	-	51	-	-	-	...	...	...
Guyana	-	64	-	-	-	...	...	...
Mexico	-	-	-	-	-	11	7	...
Dominican Republic	-	516	47 013	83 499	93 097	102 186	110 768	91 072
Venezuela	-	-	-	-	-	-	193	...
Silver	78 437	39 782	67 595	235 168	248 552	309 378	315 670	347 336
Argentina	230	1 131	1 496	1 127	-	-	135	-
Bolivia	10 508	8 342	7 590	12 561	26 834	28 541	24 323	30 608
Brazil	124	140	270	672	5 827	291	1 215	361
Colombia	-	-	-	-	-	-	-	952
Chile	5 317	4 759	2 357	815	10 047	27 327	12 700*	12 700*
Honduras	4 151	3 989	4 332	7 417	10 925	11 032	13 549	11 793
Mexico	29 187	215	19 937	186 536	112 331	132 104	115 898	120 100*
Nicaragua	175	205	179	178	268	218	177	405
Peru	28 745	21 001	31 434	25 862	82 320	82 997	92 910	114 895
Dominican Republic	-	-	-	-	-	26 868a/	54 763a/	55 322a/
Lead	99 921	75 332	81 936	116 932	211 149	133 778	150 668	202 142
Argentina	248	198	-	-	-	-	680	2 239
Bolivia	7 808	5 949	5 776	8 347	11 495	7 706	8 436	12 398
Brazil	513	-	-	-	-	-	-	-
Colombia	-	-	-	-	106	108	105	174
Chile	172	-	224	-	-	355	...	...
Honduras	-	-	-	4 881	7 194	4 000	6 359	7 279
Mexico	27 708	19 709	21 141	24 310	71 446	46 287	40 433	52 700*
Nicaragua	-	-	-	1 069	2 495	1 813	745	1 679
Peru	63 472	49 476	54 795	78 325	118 413	73 509	93 912	125 673
Zinc	89 046	96 340	128 942	172 659	387 041	334 075	344 815	319 100
Argentina	1 063	743	-	127	702	-	919	176
Bolivia	14 319	15 270	15 438	25 963	37 657	40 332	39 139	44 745
Brazil	-	-	-	-	1 321	1 675	1 339	925
Chile	-	-	-	326	1 437	1 350	...	...
Ecuador	43	41	15	-	99	...	...	...
Honduras	-	-	-	8 368	7 559	16 200	11 918	12 636
Mexico	35 806	31 894	37 969	28 835	141 129	94 790	114 999	117 000*
Nicaragua	-	-	-	1 877	5 607	2 318	3 026	2 630
Peru	47 815	48 392	75 520	107 163	191 550	177 410	173 475	140 788

Sources: United Nations, Commodity Trade Statistics, Statistical Papers, various issues; Anuario de Comercio Exterior and bulletins of the central banks of a number of countries.

a/ Silver and gold alloys.

Table 3

LATIN AMERICA (14 COUNTRIES): EXPORTATION OF THE PRINCIPAL METALS

(Thousands of dollars FOB)

SITC Rev.2		1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
	Argentina (1)				32 473	39 167	43 123	117 605	143 783	24 692	92 872	86 301	
684.2	Aluminium				310	275	264	1 644	3 327	246	907	1 673	
283.1/682	Copper				212	115	675	2 064	1 740	292	591	1 022	
283.6/687	Tin				2 351	1 897	2 239	2 232	4 589	1 896	410	-	
284/671-679	Iron				28 059	34 808	38 449	110 411	133 429	22 258	89 230	81 191	
681.1	Silver				230	1 131	1 496	1 127	-	-	135	-	
283.4/685	Lead				248	198	-	-	-	-	680	2 239	
283.5/686	Zinc				1 063	743	-	127	702	-	919	176	
	Bolivia (2)				152 165	143 736	151 107	191 304	322 121	255 240	294 796	418 703	453 455
	Tin				107 032	105 878	113 541	130 993	230 117	171 398	216 329	326 653	373 678
	Copper				12 498	8 297	8 762	13 440	16 018	7 263	6 519	4 099	3 968
	Silver (complex)				10 508	8 342	7 590	12 561	26 834	28 541	24 323	30 808	33 764
	Lead				7 808	5 949	5 776	8 347	11 495	7 706	8 436	12 398	10 683
	Zinc				14 319	15 270	15 438	25 963	37 657	40 332	39 139	44 745	31 362
	Brazil (1)				313 051	293 123	322 795	482 663	755 228	1 122 188	1 241 720	1 147 893	
283.3/684.1/684.2	Bauxite/aluminium				129	257	433	315	1 335	1 913	1 097	1 987	
283.1/682.1/682.2	Copper				1 005	772	2 018	2 522	2 547	1 464	974	2 907	
283.6/687.1/687.2	Tin				4 053	3 750	5 287	5 802	21 512	24 137	13 728	22 247	
281/671-679	Iron				307 227	288 204	314 787	473 352	722 686	1 092 514	1 223 367	1 119 124	
683.2	Nickel				-	-	-	-	-	194	-	342	
285/681.1/681.2	Silver				124	140	270	672	5 827	291	1 215	361	
283.4	Lead				513	-	-	-	-	-	-	-	
283.5	Zinc				-	-	-	-	1 321	1 675	1 339	925	
	Colombia				1 185	850	1 873	9 458	8 353	4 220	5 828	6 509	
684	Aluminium				216	244	532	841	891	442	895	854	
283.1/682	Copper				547	122	-	-	-	-	310	645	
671-679	Iron				422	484	1 341	8 617	7 250	3 670	4 520	3 884	
683.2	Nickel				-	-	-	-	106	-	-	-	
681.2	Silver/platinum				-	-	-	-	-	-	-	952	
283.4	Lead				-	-	-	-	106	108	103	174	

Table 3 (continued)

SITC Rev. 2		1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
	Chile (3)		809 678	932 472	1 057 558	768 074	691 645	1 067 293	2 046 111	1 132 724			
684.2	Aluminium		-	-	-	-	-	-	-	195			
283.1/682.1/682.2	Copper		726 642	838 599	977 205	687 592	630 657	1 007 167	1 897 959	985 236			
281/671-679	Iron		73 853	73 778	74 842	75 725	58 367	58 930	136 110	118 222			
683.1	Nickel		-	-	-	-	-	-	558	39			
285/681.1	Silver		-	109	5 317	4 759	2 357	815	10 047	27 327			
283.4/685.1	Lead		-	-	172	-	224	-	-	355			
283.5/686.1	Zinc		-	-	-	-	-	326	1 437	1 350			
	Ecuador (4)	324	373	695	819	1 232	1 076	1 438	1 385				
283.1	Copper	20	334	695	776	1 104	1 061	1 437	1 286				
281/678	Iron	-	-	-	-	36	-	1	-				
283.2	Nickel	-	-	-	-	51	-	-	-				
285	Silver	109	-	-	-	-	-	-	-				
283.4	Lead	128	-	-	-	-	-	-	-				
283.5	Zinc	67	39	-	43	41	15	-	99				
	Guyana (5)				69 279	68 983	63 292	63 438	89 950	114 061	114 934	130 256	
283.2/684.2	Bauxite/aluminium				69 279	68 918	63 290	63 431	89 826	112 531	113 788	129 905	
673/674/675	Iron				-	1	2	7	124	1 530	1 146	351	
283.2	Nickel				-	64	-	-	-	-	-	-	
	Honduras (1)				9 555	9 744	11 108	20 884	26 386	31 823	32 540	32 713	
283.1	Copper				5 404	5 755	6 776	-	-	-	-	-	
67	Iron				-	-	-	218	728	591	714	805	
285/681.1	Silver				4 151	3 989	4 332	7 417	10 925	11 032	13 549	11 793	
283.4	Lead				-	-	-	4 881	7 194	4 000	6 359	7 279	
283.5/686.1	Zinc				-	-	-	8 368	7 539	16 200	11 918	12 836	
	Jamaica (6)				224 426	218 675	236 285	250 962	505 934	537 021	428 540	539 097	
283.3	Bauxite/aluminium				224 272	217 831	235 397	249 962	504 934	536 021	427 540	538 097	
67/283.1/682.1/682.2 685.1/685.2/686.2	Other metals				154	844	888	1 000*	1 000*	1 000*	1 000*	1 000*	
	Mexico (7)			147 466	133 384	122 610	182 054	317 235	410 243	351 872	348 058		
684.1/684.2	Aluminium			255	398	1 563	846	652	1 626	823	1 006		
283.1/682.1/682.2	Copper			19 907	10 410	15 398	39 505	47 951	30 064	30 143	19 403		
283.6/687.2	Tin			-	-	-	-	-	-	784	-		
281/671-679	Iron			27 884	29 880	53 831	62 656	28 951	53 647	46 930	56 352		
683.2	Nickel			-	-	-	-	-	-	11	7		
285/681.1	Silver			44 178	29 187	215	19 937	186 536	112 331	132 104*	115 898*		
283.4/685.1/685.2	Lead			23 852	27 708	19 709	21 141	24 310	71 446	46 287	40 433		
283.5/686.1/686.2	Zinc			31 390	35 806	31 894	37 969	28 835	141 129	94 750	114 999		

Table 3 (concluded)

SITC Rev. 2		1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
	Nicaragua (8)				5 275	3 802	4 365	4 645	10 039	7 708	7 721	9 924	
684.2	Aluminium				-	-	-	-	-	140	569	867	
283.1/682.1	Copper				3 975	2 643	2 724	-	-	110	87	303	
671-679	Iron				1 125	954	1 453	1 521	1 669	3 109	3 117	4 035	
681.1	Silver				175	205	179	178	268	218	177	405	
283.4	Lead				-	-	-	1 089	2 495	1 813	745	1 679	
283.5	Zinc				-	-	-	1 877	5 607	2 318	3 026	2 630	
	Peru (9)				484 926	361 152	426 042	572 696	854 870	573 405	656 507	852 794	
684.2	Aluminium				-	101	118	172	91	441	233	304	
283.1/682.1/682.2	Copper				277 275	179 347	198 922	300 096	385 250	181 651	237 539	381 287	
283.6	Tin				269	316	303	219	1 736	1 618	1 701	3 461	
281/671-679	Iron				67 350	62 519	64 950	60 859	75 510	55 779	56 737	86 386	
285/681.1	Silver				28 745	21 001	31 434	25 862	82 320	82 997	92 910	114 895	
283.4/685.1/685.2	Lead				63 472	49 476	54 795	78 325	118 413	73 509	93 912	125 673	
283.5/686.1/686.2	Zinc				47 815	48 392	75 520	107 163	191 550	177 410	173 475	140 788	
	Dominican Republic (10)				15 132	16 499	61 877	98 334	110 853	145 779	181 052	168 377	
	Bauxite				15 132	15 983	14 864	14 835	17 756	16 725	15 521	21 983	
	Ferro-nickel				-	516	47 013	83 499	93 097	102 186	110 768	91 072	
	Doré (silver and gold alloy)				-	-	-	-	-	26 868	54 763	55 322	
	Venezuela (1)			173 770	199 027	178 053	167 714	194 685	314 309	294 415	344 119		
684.1/684.2	Aluminium			5 201	7 414	7 074	5 488	6 091	15 002	10 309	16 127		
281/671-679	Iron			168 569	191 613	170 979	162 226	188 594	299 307	284 106	327 799		
683.2	Nickel			-	-	-	-	-	-	-	193		

Source: (1) United Nations, Commodity Trade Statistics, Statistical Papers, various issues.
(2) Banco Central de Bolivia, Boletín, July 1979.
(3) United Nations, Commodity Trade Statistics, Statistical Papers, various issues; Superintendencia de Aduanas de Chile, Anuario de exportaciones por partida, 1975.
(4) Instituto Nacional de Estadística del Ecuador, Comercio exterior ecuatoriano, various issues.
(5) Guinea, Ministry of Economic Development, Statistical Bureau, Annual and Monthly Account Relating to External Trade, various issues.
(6) Jamaica, Department of Statistics, External Trade, various issues; Indexes of External Trade, 1969-1977.
(7) United Nations, Commodity Trade Statistics, Statistical Papers, various issues; Mexico, Secretaría de Programación y Presupuesto, Anuario estadístico del comercio exterior de los Estados Unidos Mexicanos, 1975 and 1976.
(8) United Nations, Commodity Trade Statistics, Statistical Papers, various issues; Banco Central de Nicaragua/Ministerio de Hacienda, Comercio Exterior, 1976 and 1977.
(9) United Nations, Commodity Trade Statistics, Statistical Papers, various issues; Peru, Anuario de comercio exterior, 1974, 1975, 1976 and 1977.
(10) Dominican Republic: Anuario de Comercio Exterior, 1970 and 1971; Banco Central de la República Dominicana, Boletín Mensual, July 1978 and July 1979.

Table 4

LATIN AMERICA (14 COUNTRIES): EXPORTS AND TOTAL PRINCIPAL METAL EXPORTS

(Million of current dollars)

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Argentina										
Total exports	1 646.0	1 914.0	2 123.0	2 110.0	2 314.8	3 722.9	4 582.6	3 532.0	4 560.3	6 560.0
Mineral exports	30.0	30.0	32.3	39.2	43.1	117.6	143.8	24.7	92.9	86.0
Mineral exp./Total exp.	1.8	1.6	1.5	1.9	1.9	3.2	3.1	0.7	2.0	1.3
Bolivia										
Total exports	170.2	190.8	210.3	198.3	224.7	295.5	627.6	527.8	629.6	721.3
Mineral exports	...	...	152.2	143.7	151.1	191.3	322.1	255.2	294.8	418.7
Mineral exp./Total exp.	...	...	72.4	72.5	67.2	64.5	51.3	48.4	46.8	58.0
Brazil										
Total	2 076.0	2 579.0	3 088.0	3 279.0	4 374.3	6 710.6	8 651.8	9 477.6	10 881.3	13 114.2
Mineral exports	...	...	313.0	293.1	322.8	482.7	755.2	1 122.2	1 241.7	1 147.9
Mineral exp./Total exp.	...	...	10.2	8.9	7.4	7.2	8.7	11.8	11.4	8.8
Colombia										
Total exports	788.0	870.0	1 000.0	983.0	1 219.3	1 561.7	1 860.7	2 166.5	2 903.6	3 427.0
Mineral exports	0.6	0.8	1.2	0.8	1.9	9.3	8.3	4.2	5.8	6.5
Mineral exp./Total exp.	0.1	0.1	0.1	0.1	0.2	0.6	0.4	0.2	0.2	0.2
Chile										
Total exports	1 033.0	1 307.0	1 251.0	1 128.0	979.3	1 434.2	2 384.5	1 747.3	2 291.8	2 530.2
Mineral exports	800.7	902.5	1 057.5	768.1	691.6	1 057.3	2 046.1	1 132.7	...	...
Mineral exp./Total exp.	77.4	69.1	84.5	68.1	70.6	74.4	85.8	64.8	...	...
Ecuador										
Total exports	223.1	215.3	258.6	254.2	365.0	625.7	1 307.7	1 109.6	1 394.1	1 495.0
Mineral exports	0.4	0.7	0.8	1.2	1.1	1.4	1.4	...	...	...
Mineral exp./Total exp.	0.2	0.3	0.3	0.5	0.3	0.2	0.1	...	...	...
Guyana										
Total exports	151.0	143.9	148.2	164.9	165.1	158.7	294 3	372.5	305.7	293.5
Mineral exports	45.6	50.8	69.3	69.0	63.3	63.4	89.9	114.1	114.9	130.3
Mineral exp./Total exp.	34.8	35.3	46.8	41.8	38.3	39.9	30.5	30.6	37.6	44.4
Honduras										
Total exports	196.7	186.9	196.5	214.8	234.9	293.6	331.2	343.5	443.1	554.8
Mineral exports	...	9.4	9.6	9.7	11.1	20.9	26.4	31.8	32.5	32.7
Mineral exp./Total exp.	...	5.0	4.9	4.5	4.7	7.1	8.0	9.3	7.3	5.9
Jamaica										
Total exports	413.7	465.4	520.9	542.0	615.1	630.8	1 029.9	1 099.4	933.3	1 077.2
Mineral exports	106.8	141.1	224.4	218.7	236.3	251.0	505.9	537.0	428.5	539.1
Mineral exp./Total exp.	25.8	30.3	43.1	40.4	38.4	39.8	49.1	48.8	45.9	50.0
Mexico										
Total exports	2 450.0	2 897.0	2 868.0	3 097.0	3 736.0	4 743.4	6 221.7	6 248.1	6 962.9	7 916.0
Mineral exports	...	147.3	133.4	122.6	182.0	317.2	410.2	351.9	348.1	...
Mineral exp./Total exp.	...	5.1	4.7	4.0	4.9	6.7	6.6	5.6	5.0	...
Nicaragua										
Total exports	192.9	190.1	215.2	224.2	318.8	349.4	451.0	456.0	626.0	743.4
Mineral exports	...	...	5.3	3.8	4.4	4.6	10.0	7.7	7.7	9.9
Mineral exp./Total exp.	...	...	2.5	1.7	1.4	1.3	2.2	1.7	1.2	1.3
Peru										
Total exports	999.0	1 030.0	1 224.0	1 054.0	1 153.0	1 344.7	1 840.9	1 688.9	1 745.6	2 187.9
Mineral exports	...	...	484.9	361.1	426.0	572.7	854.9	573.4	656.5	852.8
Mineral exp./Total exp.	...	...	39.6	33.9	36.9	42.6	46.4	34.0	37.6	39.0
Dominican Republic										
Total exports	199.5	227.4	255.9	291.4	410.8	512.9	729.7	1 002.9	830.9	903.5
Mineral exports	...	...	15.1	16.5	61.9	98.3	110.8	145.8	181.0	168.4
Mineral exp./Total exp.	...	...	5.9	5.7	15.1	19.2	15.2	14.5	21.8	18.6
Venezuela										
Total exports	2 767.0	2 728.0	2 834.0	3 330.0	3 425.4	5 104.7	11 720.7	9 488.6	10 070.9	10 713.0
Mineral exports	148.7	173.8	199.0	178.0	167.7	194.7	314.3	294.4	344.1	...
Mineral exp./Total exp.	5.2	6.4	7.0	5.3	4.9	3.8	2.7	3.1	3.4	...

Source: CEPAL, El balance de pagos de América Latina 1950-1977, Serie Cuadernos Estadísticos; United Nations, Commodity Trade Statistics, Statistical Papers, various issues; Anuario de Comercio exterior of the individual countries and reports of the central banks of the individual countries.

Table 5

PRICES OF METALS

(Average cash prices)

Year	International price index b/ (1975=100)		Aluminium c/		Copper d/		Tin e/		Lead f/		Zinc g/		Nickel h/	
			(Dollars per ton)											
	Index	Exchange rate £1 = US$	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real
			A. Nominal and real prices a/ of metals on United States markets, 1950-1979											
1950	33	2.8000	368	1 115	468	1 418	2 105	6 382	293	888	306	927	987	2 991
1951	40	2.7824	397	995	534	1 335	2 802	7 005	386	965	397	993	1 190	2 975
1952	41	2.8100	406	990	534	1 302	2 656	6 478	363	885	357	871	1 246	3 039
1953	39	2.8109	434	1 113	635	1 628	2 113	5 418	297	762	239	613	1 320	3 385
1954	38	2.8089	445	1 171	655	1 724	2 025	5 329	310	816	235	618	1 333	3 508
1955	38	2.7917	482	1 268	827	2 176	2 088	5 495	334	879	271	713	1 444	3 800
1956	40	2.7959	530	1 325	922	2 305	2 236	3 590	353	883	297	743	1 437	3 593
1957	41	2.7935	560	1 366	652	1 590	2 122	5 176	323	788	251	612	1 631	3 978
1958	41	2.8098	546	1 332	568	1 385	2 097	5 115	267	651	227	554	1 631	3 978
1959	42	2.8089	545	1 298	687	1 636	2 250	5 357	269	640	252	600	1 631	3 883
1960	43	2.8077	573	1 333	707	1 644	2 236	5 200	263	612	285	663	1 631	3 793
1961	43	2.8023	561	1 305	660	1 535	2 498	5 809	240	558	254	591	1 712	3 981
1962	42	2.8078	526	1 252	675	1 607	2 528	6 019	212	505	256	610	1 761	4 193
1963	43	2.7999	409	1 160	675	1 570	2 572	5 981	245	570	264	614	1 742	4 051
1964	43	2.7925	523	1 216	705	1 640	3 474	8 079	300	698	299	695	1 742	4 051
1965	44	2.7962	540	1 227	772	1 755	3 929	8 930	353	802	320	727	1 734	3 941
1966	45	2.7932	540	1 200	797	1 771	3 617	8 038	333	740	320	711	1 739	3 864
1967	45	2.7467	551	1 224	843	1 873	3 383	7 518	309	687	305	678	1 935	4 300
1968	43	2.3939	564	1 312	923	2 147	3 266	7 595	291	677	298	693	2 094	4 870
1969	43	2.3902	599	1 393	1 048	2 437	3 626	8 433	328	763	322	749	2 324	5 405
1970	48	2.3958	633	1 319	1 272	2 650	3 840	8 000	344	717	338	704	2 844	5 925
1971	52	2.4435	639	1 229	1 134	2 181	3 689	7 094	304	585	355	683	2 932	5 638
1972	57	2.5016	582	1 021	1 116	1 958	3 900	6 842	331	581	391	686	3 079	5 402
1973	69	2.4521	551	799	1 298	1 881	5 016	7 270	359	520	455	659	3 373	4 888
1974	87	2.3999	752	864	1 690	1 943	8 736	10 041	497	571	792	910	3 825	4 397
1975	100	2.2218	877	877	1 401	1 401	7 492	7 492	475	475	859	859	4 571	4 571
1976	101	1.8066	978	968	1 517	1 502	8 373	8 290	509	504	816	808	4 966	4 917
1977	111	1.7456	1 132	1 020	1 451	1 307	11 786	10 618	677	610	758	683	5 295	4 770
1978 i/	126 j/	1.9195	...	...	1 451	1 152	12 942	10 271	742	589	683	542	...	...
1979 i/	143 j/	2.1216	...	...	2 033	1 422	15 720	10 993	1 249	873	824	576	...	...

Source: Current prices of metals: Metallgesellschaft Aktiengesellschaft, "Metal Statistics 1967-1977"; International price index: IBRD, "Commodity Trade and Price Trends" (1978 edition), p. 32.

a/ 1975 dollars.
b/ Cif index, unit value index in dollars for manufactured products exported from industrialized countries to developing countries.
c/ Aluminium in ingots 99.5%, principal United States producers.
d/ Electrolytic copper, United States producers, prices FOB refinery.
e/ Straits tin.
f/ Lead, regular grade, New York.
g/ Zinc, Prime Western, Saint Louis.
h/ Nickel, electrolytic cathodes.
i/ World Bureau of Metal Statistics, World Metal Statistics, 1980.
j/ World Bank figures, Commodity Trends and Price Trends, 1980.

Table 5 (concluded)

Year	International price index b/	Aluminium c/		Copper d/		Tin e/		Lead f/		Zinc g/		Nickel h/	
		(Dollars per ton)											
		Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real
		B. Nominal and real price[a/] of metals on the London Metal Exchange, 1950-1979											
1950	33	514	952	493	1 494	2 055	6 227	293	888	328	994	991	3 003
1951	40	339	848	603	1 508	2 957	7 393	444	1 110	470	1 175	1 188	2 970
1952	41	431	1 051	717	1 749	2 667	6 505	335	817	413	1 007	1 256	3 063
1953	39	434	1 113	706	1 810	2 022	5 185	253	649	208	533	1 332	3 415
1954	38	431	1 134	687	1 808	1 987	5 229	266	700	216	568	1 345	3 553
1955	38	459	1 208	965	2 539	2 034	5 353	291	766	249	655	1 427	3 755
1956	40	524	1 310	905	2 263	2 167	5 418	320	800	269	673	1 445	3 613
1957	41	542	1 322	603	1 471	2 075	5 063	266	649	224	546	1 651	4 027
1958	41	509	1 241	546	1 332	2 033	4 959	201	490	182	444	1 661	4 051
1959	42	493	1 186	657	1 564	2 171	5 169	196	467	227	540	1 660	3 952
1960	43	514	1 195	680	1 581	2 201	5 119	199	463	247	574	1 659	3 858
1961	43	513	1 193	633	1 472	2 449	5 695	177	412	214	493	1 737	4 040
1962	42	499	1 188	647	1 540	2 478	5 900	156	371	186	443	1 794	4 271
1963	43	499	1 160	645	1 500	2 507	5 830	175	407	211	491	1 770	4 116
1964	43	525	1 221	965	2 244	3 399	7 905	278	647	324	753	1 765	4 105
1965	44	539	1 225	1 288	2 927	3 886	8 832	317	720	311	707	1 767	4 016
1966	45	539	1 198	1 526	3 391	3 565	7 922	262	582	280	622	1 793	3 984
1967	45	540	1 200	1 130	2 511	3 306	7 347	227	504	272	604	1 996	4 431
1968	43	551	1 281	1 235	2 879	3 119	7 253	240	558	262	609	2 128	4 949
1969	43	586	1 363	1 460	3 395	3 413	7 937	288	670	285	663	2 372	5 514
1970	48	613	1 277	1 412	2 942	3 667	7 640	303	651	295	615	2 900	6 042
1971	52	628	1 208	1 086	2 088	3 513	6 756	254	488	310	596	3 014	5 796
1972	57	588	1 032	1 070	1 877	3 768	6 611	302	530	378	663	3 138	5 505
1973	69	598	867	1 783	2 584	4 823	6 990	429	622	850	1 232	3 421	4 958
1974	87	765	879	2 053	2 360	8 177	9 399	591	679	1 236	1 421	3 864	4 441
1975	100	869	869	1 236	1 236	6 866	6 866	413	413	745	745	4 545	4 545
1976	101	897	888	1 410	1 396	7 664	7 588	451	447	712	705	4 977	4 928
1977	111	1 143	1 030	1 310	1 180	10 773	9 705	617	556	590	532	5 532	4 984
1978i/	126j/	...	...	1 363	1 082	12 864	10 210	658	522	591	469	...	...
1979i/	143j/	...	...	1 986	1 389	15 461	10 812	1 205	841	744	520	...	...

Source: Current prices of metals; Metallgesellschaft Aktiengesellschaft, "Metal Statistics 1967-1977"; International price index: World Bank, Commodity Trends and Price Trends, 1980.

a/ 1975 dollars.

b/ CIF index, unit value index in dollars for manufactured products exported from industrialized countries to developing countries.

c/ London Market, index 99.5%.

d/ LME, electrolytic copper.

e/ LME, standard type of tin.

f/ LME, refined ingots of lead, minimum 99.7%.

g/ LME, zinc, minimum 98%.

h/ Nickel, refined.

i/ World Bureau of Metal Statistics, World Metal Statistics, 1980.

j/ World Bank figures, Commodity Trends and Price Trends, 1980.

Table 6

ACCUMULATED EXTERNAL DEBT[a/] AS A PERCENTAGE OF GROSS DOMESTIC PRODUCT, 1973-1979

(Millions of 1970 dollars)

	1973	1974	1975	1976	1977	1978	1979 b/
Bolivia							
External debt c/	564.0	504.0	501.0	603.0	716.0	786.0	751.0
Gross domestic product	1 508.6	1 601.0	1 685.1	1 799.0	1 871.8	1 933.7	1 962.7
Ratio	37.4	31.5	29.7	33.5	38.3	40.6	38.3
Brazil							
External debt d/	8 923.0	7 969.0	9 205.0	10 634.0	12 764.0	16 199.0	15 257.0
Gross domestic product	61 841.8	67 888.1	71 748.1	78 179.7	81 825.1	86 756.7	92 309.2
Ratio	14.4	11.7	12.8	13.6	15.6	18.7	16.5
Colombia							
External debt e/	1 746.0	1 443.0	1 455.0	1 493.0	1 463.0	1 399.0	1 439.0
Gross domestic product	13 780.7	14 672.9	15 299.5	15 938.8	16 687.2	18 155.7	19 109.6
Ratio	12.7	9.8	9.5	9.4	8.8	7.7	7.5
Chile							
External debt f/	3 030.0	2 697.0	2 474.0	2 394.0	2 262.0	2 658.0	...
Gross domestic product	8 292.8	8 731.9	7 703 3	8 061.1	8 685.9	9 204.6	...
Ratio	36.5	30.9	32.1	29.7	26.0	28.9	...
Honduras							
External debt g/	159.0	156.0	188.0	214.0	244.0	297.0	315.0
Gross domestic product	840.8	840.8	824.7	875.3	925.6	998.5	1 049.4
Ratio	18.9	18.6	22.8	24.4	26.4	29.7	30.0
Jamaica							
External debt h/	300.0	326.0	393.0	496.0	512.0	493.0	...
Gross domestic product	...	...	...	...	...	...	...
Ratio	...	...	...	...	...	...	...
Mexico							
External debt i/	5 702.0	6 184.0	8 214.0	10 716.0	12 161.0	12 912.0	13 092.0
Gross domestic product	53 645.6	56 811.9	59 129.8	60 387.2	62 356.7	66 750.1	72 090.2
Ratio	10.6	10.9	13.9	17.7	19.5	19.3	18.2
Nicaragua							
External debt j/	282.0	310.0	345.0	353.0	445.0	426.0	449.0
Gross domestic product	883.4	995.7	1 017.6	1 068.9	1 136.0	1 054.8	793.2
Ratio	31.9	31.1	33.9	33.0	39.2	40.4	56.6
Peru							
External debt k/	1 440.0	1 640.0	1 985.0	2 234.0	2 503.0	2 726.0	2 683.0
Gross domestic product	8 917.8	9 585.1	10 019.9	10 222.4	10 218.7	10 150.8	10 536.5
Ratio	16.1	17.1	19.8	21.9	24.5	26.9	25.5
Dominican Republic							
External debt l/	413.0	383.0	387.0	444.0	498.0	516.0	579.0
Gross domestic product	2 104.9	2 231.4	2 347.2	2 505.2	2 642.6	2 704.0	2 801.4
Ratio	19.6	17.2	16.5	17.7	18.8	19.1	20.7
Venezuela							
External debt m/	1 182.0	922.0	671.0	1 445.0	1 960.0	2 786.0	...
Gross domestic product	14 148.5	14 975.8	15 753.5	16 980.0	18 274.2	19 155.1	19 940.4
Ratio	8.4	6.2	4.3	8.5	10.7	14.5	...

Source: CEPAL, on the basis of official data.

a/ The external debt figures of the individual countries were calculated in terms of 1970 dollars, using the unit value index for imported goods as a deflator.
b/ Provisional figures.
c/ External debt disbursed, public and private guaranteed by the State.
d/ Consolidated external debt.
e/ Current public debt guaranteed by the State.
f/ General external debt.
g/ Total external debt, disbursed in the form of loans with terms of more than one year.
h/ Public debt disbursed and private debt guaranteed by the State.
i/ External public debt disbursed.
j/ External debt disbursed, public and guaranteed by the State.
k/ Total debt disbursed, public and private.
l/ External debt disbursed.
m/ Debt disbursed, public and private guaranteed by the State, long and medium-term.

Table 7

LATIN AMERICA (14 COUNTRIES): TERMS OF TRADE, 1977-1978

Country	Growth rates							Indices (1970=100)						
	1972	1973	1974	1975	1976	1977	1978a/	1972	1973	1974	1975	1976	1977	1978a/
Argentina	13.0	18.7	-12.7	-19.8	-12.5	-13.1	5.0	123.2	146.2	127.6	102.4	90.6	78.7	82.7b/
Bolivia	-2.4	9.2	59.6	-20.6	2.9	5.9	...	79.9	87.6	139.7	111.0	114.2	120.9	120.9
Brazil	...	9.4	-15.0	-8.0	11.0	8.5	-13.1	...	...	90.9	83.6	92.8	100.8	87.6
Colombia	...	14.0	-9.4	-9.5	39.7	47.4	-22.0	...	111.6	101.1	91.5	127.8	188.4	146.9b/
Chile	-7.9	15.7	5.6	-39.5	7.4	-10.3	-5.1	72.0	83.3	88.0	53.2	57.1	51.5	48.7
Ecuador	...	12.7	76.0	-20.5	8.2	10.0	-10.3	...	95.0	167.1	133.0	143.8	158.3	141.8
Guyana		-10.3	33.8	2.6	-15.5	3.7	5.9	...	101.0	135.1	138.7	117.2	121.5	125.7
Honduras	...	0.2	2.4	-5.1	8.3	12.7	-6.7	...	96.2	98.5	93.5	101.3	114.2	106.5
Jamaica	...	-10.3	29.6	18.3	-12.7	-	-6.6	...	87.7	113.6	134.4	117.4	117.4	109.7
Mexico	...	3.1	9.4	-5.2	8.7	6.8	-3.9	...	102.0	111.6	105.7	114.9	122.7	117.9b/
Nicaragua	...	-4.6	-4.4	-19.2	22.0	33.3	-13.5	...	102.7	98.2	79.4	96.8	129.0	111.5
Peru	...	24.8	18.3	-15.1	-3.5	-7.7	-11.1	...	104.7	123.7	105.1	101.4	93.6	83.5
Dominican Republic	...	-3.5	13.2	40.3	-32.9	4.0	-15.7	...	94.1	106.5	149.4	100.2	104.2	87.8
Venezuela	...	20.8	114.7	-8.0	-2.7	1.1	-9.1	118.7	143.3	307.7	283.2	275.5	278.4	253.1

Source: CEPAL, Economic Survey of Latin America, 1978, tables 27, 61, 72, 91, 106, 114, 155, 170, 182, 187, 233, 239, 259, 265, 272, 279, 290, 297, 309, 317, 347, 359, 368, 375, 423 and 430.

a/ Provisional figures.

b/ Terms of trade for goods.

Table 8

LATIN AMERICA (13 COUNTRIES): PROPENSITY TO SAVE, 1976-1978[a]

(Millions of monetary units of each country, at 1970 prices)

Country	GDP [b] (A)	Total consumption (B)	Savings (A)-(B)	Propensity to save (A)-(B)/A (percentages)
Argentina	336 288	255 731	80 557	24.0
Bolivia	54 970	48 887	6 083	11.1
Brazil	1 199 646	898 333	301 313	25.1
Colombia [c]	183.3	145.4	37.9	20.7
Chile [d]	98 121	79 992	18 129	18.5
Ecuador	177 306	148 870	28 436	16.0
Guyana [e]	3 568	2 974	594	16.6
Honduras	5 703	4 938	765	13.4
Mexico	1 754 622	1 395 902	358 720	20.4
Nicaragua	23 089	19 471	3 618	15.7
Peru	957 317	832 532	124 785	13.0
Dominican Republic	7 616	6 018	1 598	21.0
Venezuela	224 694	174 686	50 008	22.3

Source: CEPAL, Economic Survey of Latin America, 1978, tables, 16, 62, 83, 107, 156, 183, 234, 260, 291, 310, 348, 369 and 424.

a/ Cumulative figures for the three years.
b/ At market prices.
c/ Billions of 1976 pesos.
d/ Thousands of 1976 pesos.
e/ Millions of Guyanese dollars at current prices.

Table 9

LATIN AMERICA (12 COUNTRIES): SECTORAL PRODUCTIVITY OF THE ECONOMICALLY ACTIVE POPULATION IN CENSUS YEARS

	Agriculture, forestry, hunting and fishing	Mining and quarrying	Manufacturing industry	Construction	Subtotal goods	Electricity, gas water, sanitation	Transport and communication	Subtotal basic services	Subtotal other services	Total GDP a/b/
ARGENTINA										
1960										
GDP by branches of activity (millions of 1970 dollars)	2 984.5	250.6	5 013.8	904.0	9 152.9	221.4	2 011.1	2 232.5	7 696.6	18 789.2
Economically active population (thousands)	1 456.3	44.7	2 050.6	470.9	4 022.5	91.7	576.5	668.2	2 692.4	7 383.1
GDP/EAP (dollars per person)	2 049.0	5 606.0	2 445.0	1 920.0	2 275.0	2 414.0	3 488.0	3 341.0	2 859.0	2 545.0
1970										
GDP by branches of activity (millions of 1970 dollars)	3 769.3	606.0	8 672.0	1 649.0	14 696.3	616.7	2 907.4	3 524.2	10 465.6	28 686.0
Economically active population (thousands)	1 425.2	47.5	2 135.7	767.6	4 376.0	104.0	595.9	699.9	3 731.1	8 807.0
GDP/EAP (dollars per person)	2 645.0	12 758.0	4 660.0	2 148.0	3 358.0	5 930.0	4 879.0	5 035.0	2 805.0	3 257.0
Productivity growth rate, 1960-1970	2.59	8.57	5.20	1.13	3.97	9.40	3.41	4.19	-0.19	2.50
BOLIVIA										
1950										
GDP by branches of activity (millions of 1970 dollars)	200.8	74.7	98.0	11.1	393.6	6.8	39.7	46.6	270.4	712.6
Employed population	979.2	43.9	111.0	24.8	1 158.9	1.3	21.5	22.8	169.1	1 350.8
GDP/Employed population (dollars per person)	214.0	1 702.0	883.0	448.0	340.0	5 231.0	1 847.0	2 044.0	1 599.0	528.0
1976										
GDP (millions of 1970 dollars)	330.2	129.3	272.1	78.7	810.4	26.7	180.6	207.2	786.3	1 799.0
Employed population (thousands)	679.9	56.5	172.0	88.1	996.5	2.0	62.3	64.3	387.5	1 448.3
GDP/Employed population (dollars per person)	486.0	2 288.0	1 582.0	893.0	813.0	13 350.0	2 899.0	3 222.0	2 029.0	1 242.0
Productivity growth rate, 1950-1976	3.21	1.14	2.27	2.69	3.41	3.67	1.75	1.77	0.92	3.34
BRAZIL										
1960										
GDP by branches of activity (millions of 1970 dollars)	3 175.0	119.5	6 256.9	1 975.8	11 527.2	480.9	1 270.6	1 751.5	10 998.0	23 774.3
Economically active population (thousands)	12 917.5	184.9	2 056.6	808.8	15 967.8	115.5	1 086.1	1 201.6	5 938.9	23 108.3
GDP/EAP (dollars per person)	246.0	646.0	3 042.0	2 443.0	722.0	4 164.0	1 170.0	1 458.0	1 852.0	1 029.0
1970										
GDP (millions of 1970 dollars)	4 285.8	363.8	12 169.7	2 475.6	19 294.9	1 032.0	2 448.9	3 480.9	20 109.5	42 885.4
Economically active population c/ (thousands)	13 531.3	239.0	3 345.5	1 792.2	18 908.0	268.8	1 254.6	1 523.4	9 439.0	29 870.4
GDP/EAP (dollars per person)	317.0	1 522.0	3 638.0	1 381.0	1 020.0	3 839.0	1 952.0	2 285.0	2 130.0	1 436.0
Productivity growth rate, 1960-1970	2.57	8.95	1.81	-5.54	3.52	-0.81	5.25	4.60	1.41	3.39

a/ Argentina and Brazil: Total extrapolated.

b/ Bolivia: By summation.

c/ Unpublished estimate.

Table 9 (continued 1)

	Agriculture, forestry, hunting and fishing	Mining and quarrying	Manufacturing industry	Construction	Subtotal goods	Electricity, gas water, sanitation	Transport and communication	Subtotal basic services	Subtotal other services	Total GDP a/
COLOMBIA										
1951										
GDP by branch of activity (millions of 1970 dollars)	1 650.8	116.8	603.9	162.4	2 533.8	28.6	261.4	290.0	1 575.6	4 458.1
Economically active population (thousands)	2 097.8	63.2	478.2	138.1	2 777.3	10.8	134.9	145.7	832.6	3 755.6
GDP/EAP (dollars per person)	787.0	1 848.0	1 263.0	1 176.0	912.0	2 648.0	1 938.0	1 990.0	1 892.0	1 187.0
1964										
GDP (millions of 1970 dollars)	2 540.2	204.2	1 375.4	334.6	4 454.3	101.9	573.8	675.7	3 010.9	8 202.1
Economically active population (thousands)	2 492.7	84.1	681.5	232.1	3 490.4	13.8	200.4	214.2	1 417.2	5 121.8
GDP/EAP (dollars per person)	1 019.0	2 428.0	2 018.0	1 442.0	1 276.0	7 384.0	2 863.0	3 155.0	2 125.0	1 601.0
Productivity growth rate, 1951-1964	2.01	2.12	3.67	1.58	2.62	8.21	3.05	3.61	0.90	2.33
CHILE										
1960										
GDP by branches of activity (millions of 1970 dollars)	503.4	571.5	1 275.7	227.8	2 578.4	64.9	195.3	260.2	2 287.6	5 147.4
Economically active population (thousands)	713.2	94.0	443.0	139.5	1 389.7	19.4	121.7	141.1	811.1	2 342.4
GDP/EAP (dollars per person)	706.0	6 080.0	2 880.0	1 633.0	1 855.0	3 345.0	1 605.0	1 844.0	2 820.0	2 198.0
1970										
GDP (millions of 1970 dollars)	631.0	929.3	2 168.3	332.2	4 060.8	114.6	451.2	565.7	3 335.0	7 961.5
Economically active population (thousands)	615.1	83.8	586.4	166.8	1 452.1	23.8	175.1	198.9	1 011.0	2 662.0
GDP/EAP (dollars per person)	1 026.0	11 089.0	3 698.0	1 092.0	2 797.0	4 815.0	2 577.0	2 844.0	3 299.0	2 991.1
Productivity growth rate, 1960-1970	3.81	6.19	2.53	2.01	4.19	3.71	4.85	4.43	1.58	3.13
ECUADOR										
1962										
GDP by branches of activity (millions of 1970 dollars)	584.5	16.9	213.4	35.5	850.3	19.6	65.6	85.2	494.0	1 414.0
Economically active population (thousands)	810.5	4.0	213.6	49.1	1 077.2	4.7	44.4	49.1	316.3	1 442.6
GDP/EAP (dollars per person)	721.0	4 225.0	999.0	723.0	789.0	4 170.0	1 477.0	1 735.0	1 562.0	980.0
1974										
GDP (millions of 1970 dollars)	811.8	235.1	515.8	156.9	1 719.6	42.8	171.1	213.8	1 121.8	3 014.7
Economically active population (thousands)	938.7	7.8	309.8	92.7	1 349.0	10.1	63.4	73.5	518.1	1 940.6
GDP/EAP (dollars per person)	865.0	30 141.0	1 665.0	1 693.0	1 275.0	4 238.0	2 699.0	2 909.0	2 165.0	1 553.0
Productivity growth rate, 1962-1974	1.53	17.79	4.35	7.35	4.08	0.13	5.15	4.40	2.76	3.91

a/ Colombia, Chile and Ecuador: Total extrapolated.

Table 9 (continued 2)

	Agriculture, forestry, hunting and fishing	Mining and quarrying	Manufacturing industry	Construction	Subtotal goods	Electricity, gas water, sanitation	Transport and communication	Subtotal basic services	Subtotal other services	Total GDP a/
HONDURAS										
1961										
GDP by branches of activity (millions of 1970 dollars)	153.7	7.9	55.4	18.7	235.7	4.3	40.6	45.0	197.1	475.4
Economically active population (thousands)	379.7	1.8	44.2	11.6	437.3	0.8	8.0	8.8	109.1	555.2
GDP/EAP (dollars per person)	405.0	4 389.0	1 253.0	1 612.0	539.0	5 375.0	5 075.0	5 114.0	1 807.0	856.0
1974										
GDP (millions of 1970 dollars)	249.5	29.7	115.6	48.0	442.7	12.6	65.8	78.4	323.5	840.8
Economically active population (thousands)	464.4	2.3	94.1	24.8	585.6	3.2	21.6	24.8	145.8	756.1
GDP/EAP (dollars per person)	537.0	12 913.0	1 228.0	1 935.0	756.0	3 938.0	3 046.0	3 161.0	2 219.0	1 112.0
Productivity growth rate, 1961-1974	2.19	8.66	-0.15	1.41	2.64	-2.36	-3.85	-3.63	1.59	2.03
MEXICO										
1960										
GDP by branches of activity (millions of 1970 dollars)	3 686.5	967.3	4 411.9	1 083.2	10 148.9	172.2	621.8	794.0	12 003.2	22 802.?
Economically active population (thousands)	5 048.3	1 760.3		414.8	7 223.4		2 990.1			10 212.9
GDP/EAP (dollars per person)	730.0	3 056.0		2 611.0	1 405.0		4 545.0			2 233.0
1970										
GDP (millions of 1970 dollars)	5 313.0	1 822.5	10 531.4	2 410.0	20 076.9	614.1	1 167.0	1 781.1	23 076.4	44 934.4
Economically active population (thousands)	5 292.7	2 829.1		609.8	8 731.6		4 223.5			12 955.1
GDP/EAP (dollars per person)	1 004.0	4 367.0		3 952.0	2 299.0		6 307.0			3 468.0
Productivity growth rate, 1960-1970	3.24	3.63		4.23	5.05		3.33			4.50
NICARAGUA										
1973										
GDP by branches of activity (millions of 1970 dollars)	160.5	7.2	80.4	13.7	261.8	6.2	31.6	37.8	239.4	526.4
Economically active population (thousands)	251.4	4.0	54.4	15.7	325.4	1.3	11.9	13.2	99.1	437.8
GDP/EAP (dollars per person)	648.0	1 800.0	1 478.0	873.0	805.0	4 769.0	2 655.0	2 864.0	2 416.0	1 202.0
1971										
GDP (millions of 1970 dollars)	226.0	5.0	156.0	28.0	415.1	13.3	47.0	60.4	339.3	814.7
Economically active population (thousands)	222.9	2.9	73.4	20.0	319.2	3.4	17.1	20.5	135.1	474.8
GDP/EAP (dollars per person)	1 014.0	1 724.0	2 125.0	1 400.0	1 300.0	3 912.0	2 749.0	2 946.0	2 511.0	1 716.0
Productivity growth rate, 1963-1971	5.96	-0.54	4.64	6.08	6.37	-2.45	0.44	0.35	0.48	4.5

a/ Honduras, Mexico and Nicaragua: Total extrapolated.

Table 9 (concluded)

	Agriculture, forestry, hunting and fishing	Mining and quarrying	Manufacturing industry	Construction	Subtotal goods	Electricity, gas water, sanitation	Transport and communication	Subtotal basic services	Subtotal other services	Total GDP a/
PERU										
1961										
GDP by branches of activity (millions of 1970 dollars)	991.9	421.8	1 027.9	217.4	2 658.9	38.7	295.9	334.7	2 345.2	5 243.9
Economically active population (thousands)	1 585.8	71.0	428.3	111.2	2 196.3	11.5	98.9	110.4	781.6	3 088.3
GDP/EAP (dollars per person)	625.0	5 941.0	2 400.0	1 955.0	1 211.0	3 365.0	2 992.0	3 032.0	3 001.0	1 698.0
1972										
GDP (millions of 1970 dollars)	1 314.7	611.2	1 807.6	306.2	4 039.8	82.9	525.1	608.0	3 960.7	8 553.0
Economically active population (thousands)	1 628.7	57.5	581.2	184.3	2 451.7	7.9	176.3	184.2	1 164.0	3 800.1
GDP/EAP (dollars per person)	807.0	10 630.0	3 110.0	1 661.0	1 648.0	10 494.0	2 978.0	3 301.0	3 403.0	2 251.0
Productivity growth rate, 1961 1972	2.35	5.43	2.38	-1.47	2.84	10.89	-0.04	0.78	1.15	2.60
DOMINICAN REPUBLIC										
1960										
GDP by branches of activity (millions of 1970 dollars)	314.0	17.5	135.8	27.9	495.1	8.3	56.8	65.1	365.3	928.5
Economically active population (thousands)	561.1	2.6	73.2	22.5	659.4	3.6	22.9	26.5	161.9	847.8
GDP/EAP (dollars per person)	560.0	6 731.0	1 855.0	1 240.0	751.0	2 306.0	2 480.0	2 457.0	2 256.0	1 095.0
1970										
GDP (millions of 1970 dollars)	393.0	26.1	253.9	83.6	756.6	20.1	130.1	150.2	616.6	1 523.3
Economically active population (thousands)	656.8	1.1	161.9	37.7	857.5	2.3	56.5	58.8	295.4	1 211.7
GDP/EAP (dollars per person)	598.0	23 727.0	1 568.0	2 218.0	882.0	8 739.0	2 303.0	2 554.0	2 087.0	1 257.0
Productivity growth rate, 1960-1970	0.66	13.43	-1.67	5.99	1.62	14.25	-0.74	0.39	-0.78	1.39
VENEZUELA										
1961										
GDP by branches of activity (millions of 1970 dollars)	555.3	1 926.1	1 038.3	339.3	3 859.0	68.3	741.5	809.9	3 095.1	7 328.9
Economically active population (thousands)	722.4	57.3	300.0	138.0	1 217.7	24.9	123.6	148.5	877.5	2 243.7
GDP/EAP (dollars per persons)	769.0	33 614.0	3 461.0	2 459.0	3 169.0	2 743.0	5 999.0	5 454.0	3 527.0	3 266.0
1971										
GDP (millions of 1970 dollars)	975.9	2 321.2	1 944.8	570.0	5 811.9	230.7	1 437.8	1 668.6	5 487.3	12 872.9
Economically active population (thousands)	719.8	50.5	474.3	183.7	1 428.3	38.3	170.3	208.6	1 341.3	2 978.2
GDP/EAP (dollars per person)	1 356.0	45 964.0	4 100.0	3 103.0	4 069.0	6 023.0	8 443.0	7 999.0	4 091.0	4 322.0
Productivity growth rate, 1961-1971	5.84	3.18	1.71	2.35	2.53	8.18	3.48	3.90	1.49	2.84

a/ Peru, Dominican Republic and Venezuela: Total extrapolated.

Table 10

LATIN AMERICA VARIATION IN PRICES TO THE CONSUMER[a/]

	1970	1971	1972	1973	1974	1975	1976	1977	1978
Argentina	21.6	39.1	64.2	43.9	39.9	334.8	347.1	160.4	169.8
Bolivia	3.8	3.3	23.6	34.8	39.0	6.0	5.5	10.5	13.5
Brazil	17.7	18.1	14.0	13.7	33.8	31.2	44.8	43.1	38.1
Chile	34.9	22.1	163.4	508.1	375.9	340.7	174.3	63.5	30.3
Colombia	3.5	14.1	14.0	25.0	26.9	17.9	25.9	29.3	17.8
Ecuador	8.0	6.8	6.9	20.6	21.2	13.2	13.1	9.7	11.7
Guyana	2.4	1.4	7.1	15.2	11.6	5.5	9.2	9.0	20.0
Honduras	1.4	1.5	6.8	5.1	13.0	7.8	5.6	7.7	5.2
Jamaica	7.5	5.2	9.3	9.6	20.6	15.7	8.1	14.1	48.4
Mexico	7.8	-0.8	5.6	21.3	20.6	11.3	27.2	20.7	16.2
Nicaragua	...	...	...	...	...	1.9	6.2	10.2	4.4[b/]
Peru	5.7	7.7	4.3	13.8	19.2	24.0	44.7	32.4	73.7
Dominican Republic	-1.3	10.6	8.0	17.2	10.5	16.5	7.0	8.5	1.8
Venezuela	3.4	3.0	3.5	5.1	11.6	8.0	6.9	8.1	7.0
Latin America	12.2	13.3	21.2	37.0	40.7	59.7	63.6	41.6	39.9
Latin America (excluding Argentina)	11.3	10.8	17.0	36.3	40.8	33.3	36.3	30.2	27.4

Source: International Monetary Fund (IMF), International Financial Statistics, April 1969 and CEPAL, on the basis of the official data of countries.

a/ From December to December.

b/ From November to November.

Table 11

LATIN AMERICA: PATTERN OF OUTPUT, PROVEN RESERVES AND MINERAL IMPORTS

(Percentages)

Metallic minerals[a]	Argentina	Bolivia	Colombia	Chile	Peru	Venezuela	Subtotal group 1 [b]	Brazil	Subtotal group 2 [c]	Costa Rica	Honduras	Mexico	Panama	Subtotal group 3 [d]	Bahamas	Cuba	Dominican Republic	Guyana	Jamaica	Subtotal group 4 [e]	Total physical volume: Production	Reserves	Imports
Antimony																							
Output	-	82	-	-	-	-	82	-	-	-	-	12	-	18	-	-	-	-	-	-	17[f]	-	-
Reserves	-	56	-	-	10	-	66	-	-	-	-	34	-	34	-	-	-	-	-	-	-	648[f]	-
Imports	23	-	1	-	1	1	26	74	74	-	-	-	-	-	-	-	-	-	-	-	-	-	2 623[g]
Arsenic																							
Output	-	-	-	-	17	-	17	-	-	-	-	83	-	83	-	-	-	-	-	-	6[f]	-	-
Reserves	-	-	-	-	...	-	...	-	-	-	-	...	-	...	-	-	-	-	-	-	-	...	-
Imports	30	-	8	-	-	4	42	58	58	-	-	-	-	-	-	-	-	-	-	-	-	-	1 480[g]
Beryllium																							
Output	100	-	-	-	-	-	100	-	-	-	-	-	-	-	-	-	-	-	-	-	3[f]	-	-
Reserves	...	-	-	-	-	-	...	-	-	-	-	-	-	-	-	-	-	-	-	-	-	...	-
Imports	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bismuth																							
Output	-	30	-	-	25	-	55	-	-	-	-	45	-	45	-	-	-	-	-	-	2 160[g]	-	-
Reserves	-	58	-	-	21	-	79	-	-	-	-	21	-	21	-	-	-	-	-	-	-	24[f]	-
Imports	44	-	6	-	-	-	50	50	50	-	-	-	-	-	-	-	-	-	-	-	-	-	52[g]
Cadmium																							
Output	-	-	-	-	-	-	-	-	-	-	-	100	-	100	-	-	-	-	-	-	2[f]	-	-
Reserves	-	-	-	-	-	-	-	-	-	-	-	100	-	100	-	-	-	-	-	-	-	1½[f]	-
Imports	-	-	-	-	-	-	-	100	100	-	-	-	-	-	-	-	-	-	-	-	-	-	176[g]
Cobalt																							
Output	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	-	-	-	100	1[f]	-	-
Reserves	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	...	-	-	-	...	-	...	-
Imports	28	-	1	-	-	2	31	57	57	-	-	11	-	11	-	-	-	-	-	-	-	-	493[g]
Copper																							
Output	-	-	-	71	23	-	94	-	-	-	-	6	-	6	-	-	-	-	-	-	1 492[f]	-	-
Reserves	3	-	-	56	17	-	76	-	-	-	-	13	7	20	-	-	1	3	-	4	-	189 445[f]	-
Imports	21	-	3	-	-	1	25	62	62	1	-	8	-	9	-	2	1	-	1	4	-	-	235 594[g]
Columbium																							
Output	-	33	-	-	-	-	33	67	67	-	-	-	-	-	-	-	-	-	-	-	12[f]	-	-
Reserves	-	...	-	-	-	-	...	100	100	-	-	-	-	-	-	-	-	-	-	-	-	8 165[f]	-
Imports	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium																							
Output	-	-	-	-	-	-	-	91	91	-	-	-	-	-	-	9	-	-	-	9	336[f]	-	-
Reserves	-	-	-	-	-	-	-	86	86	-	-	-	-	-	-	14	-	-	-	14	-	1 390[f]	-
Imports	5	-	-	-	4	7	16	32	32	-	-	52	-	52	-	-	-	-	-	-	-	-	97 728[g]
Tin																							
Output	2	79	-	-	1	-	82	18	18	-	-	-	-	-	-	-	-	-	-	-	37 946[g]	-	-
Reserves	...	62	-	-	...	-	62	38	38	-	-	-	-	-	-	-	-	-	-	-	-	1 587[f]	-
Imports	-	-	1	-	1	1	3	26	26	-	-	16	1	17	9	-	-	-	39	53	-	-	23 773[g]
Iron ore																							
Output	-	-	-	?	3	10	20	77	77	-	-	3	-	3	-	-	-	-	-	-	116 323[f]	-	-
Reserves	-	48	-	...	...	2	50	30	30	-	-	1	-	1	-	7	-	-	-	19	-	53 773[h]	-
Imports	69	-	1	1	1	10	82	2	2	-	-	11	-	11	1	4	1	-	-	6	-	-	1 671[f]
Ilmenite																							
Output	-	-	-	-	-	-	-	100	100	-	-	-	-	-	-	-	-	-	-	-	5[f]	-	-
Reserves	-	-	-	-	-	-	-	...	...	-	-	-	-	-	-	-	-	-	-	-	-	...	-
Imports	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 11 (continued)

Metallic minerals a/	Argentina	Bolivia	Colombia	Chile	Peru	Venezuela	Subtotal group 1 b/	Brazil	Subtotal group 2 c/	Costa Rica	Honduras	Mexico	Panama	Subtotal group 3 d/	Bahamas	Cuba	Dominican Republic	Guyana	Jamaica	Subtotal group 4 e/	Total physical volume: Production	Reserves	Imports
Titanium																							
Output	-	-	-	-	-	-	-	100	100	-	-	-	-	-	-	-	-	-	-	-	23 g/	-	-
Reserves	-	-	-	-	-	-	-	100	100	-	-	-	-	-	-	-	-	-	-	-	-	2 f/	-
Imports	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lithium																							
Output	-	-	-	-	-	-	-	100	100	-	-	-	-	-	-	-	-	-	-	-	54 g/	-	-
Reserves	-	-	-	100	-	-	100	...	...	-	-	-	-	-	-	-	-	-	-	-	-	1 270 i/	-
Imports	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese																							
Output	2	1	-	2	-	-	5	81	81	-	-	14	-	14	-	-	-	-	-	-	1 345 f/	-	-
Reserves	...	32	-	1	-	-	33	65	65	-	-	1	-	1	-	-	-	1	-	1	-	61 319 f/	-
Imports	63	-	2	-	1	1	67	9	9	-	-	24	-	24	-	-	-	-	-	-	-	-	158 041 g/
Mercury																							
Output	-	-	-	-	-	-	-	-	-	-	-	100	-	100	-	-	-	-	-	-	73 g/	-	-
Reserves	-	-	-	-	-	-	-	-	-	-	-	100	-	100	-	-	-	-	-	-	-	9 000 g/	-
Imports	20	-	10	-	-	2	32	63	63	-	-	5	-	5	-	-	-	-	-	-	-	-	298 g/
Molybdenum																							
Output	-	-	-	96	3	-	99	-	-	-	-	1	-	1	-	-	-	-	-	-	12 384 f/	-	-
Reserves	-	-	-	87	8	-	95	-	-	-	-	3	-	3	-	-	-	1	-	1	-	2 806 f/	-
Imports	2	-	-	-	-	-	2	65	65	-	-	32	-	32	-	-	-	-	-	-	-	-	2 201 g/
Nickel																							
Output	-	-	-	-	-	-	-	9	9	-	-	-	-	-	-	55	36	-	-	91	66	-	-
Reserves	-	-	3	-	-	-	3	2	2	-	-	-	-	-	-	80	14	1	-	95	-	23 879 f/	-
Imports	14	-	-	-	1	7	22	36	36	-	-	35	-	35	-	-	-	-	6	6	-	-	8 824 g/
Gold																							
Output	1	2	20	9	5	1	39	12	12	1	-	14	-	20	-	-	28	1	-	29	46 035 i/	-	-
Reserves	...	...	...	...	...	...	...	...	...	...	-	...	-	...	-	-	...	...	-	...	-	...	-
Imports	12	-	-	2	6	29	49	49	49	-	-	-	2	2	-	-	-	-	-	-	-	-	2 999 i/
Silver																							
Output	1	5	-	6	42	-	54	-	-	-	2	42	-	44	-	-	1	-	-	1	3 739 g/	-	-
Reserves	...	...	...	...	39	-	39	-	-	-	...	61	-	61	-	-	...	-	-	...	-	48 521 g/	-
Imports	15	-	39	-	-	5	59	40	40	-	-	-	-	-	-	-	-	-	-	1	-	-	296 g/
Platinum																							
Output	-	-	100	-	-	-	100	-	-	-	-	-	-	-	-	-	-	-	-	-	777 i/	-	-
Reserves	-	-	100	-	-	-	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	31 103 i/	-
Imports	15	-	-	-	82	2	99	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	49 150 i/
[illegible]	8	5	-	-	39	-	52	10	10	-	4	35	-	39	-	-	-	-	-	-	492 f/	-	-
[illegible]	...	-	-	-	35	-	35	21	21	-	...	43	-	43	-	-	-	-	1	1	-	11 484 f/	-
Imports	9	-	12	7	-	16	44	47	47	1	1	1	2	5	-	3	-	-	-	3	-	-	46 362 g/
Rhenium																							
Output	-	-	-	100	-	-	100	-	-	-	-	-	-	-	-	-	-	-	-	-	200 i/	-	-
Reserves	-	-	-	87	13	-	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1 360 f/	-
Imports	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rutile																							
Output	-	-	-	-	-	-	-	100	100	-	-	-	-	-	-	-	-	-	-	-	105 f/	-	-
Reserves d/	-	-	-	-	-	-	-	100	100	-	-	-	-	-	-	-	-	-	-	-	-	55 100 f/	-
Imports	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium																							
Output	-	-	-	14	16	-	30	-	-	-	-	70	-	70	-	-	-	-	-	-	114 g/	-	-
Reserves	-	-	-	68	23		91	-	-	-	-	9	-	9	-	-	-	-	-	-	-	57 f/	-
Imports	88	-	12	-	-	-	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16 g/

Table 11 (concluded)

Metallic mineral[a]	Argentina	Bolivia	Colombia	Chile	Peru	Venezuela	Subtotal group 1 [b]	Brazil	Subtotal group 2 [c]	Costa Rica	Honduras	Mexico	Panama	Subtotal group 3 [d]	Bahamas	Cuba	Dominican Republic	Guyana	Jamaica	Subtotal group 4 [e]	Total physical volume		
																					Production	Reserves	Imports
Tantalum																							
Output	-	-	-	-	-	-	-	100	100	-	-	-	-	-	-	-	-	-	-	-	68[g]	-	-
Reserves	-	-	-	-	-	-	-	100	100	-	-	-	-	-	-	-	-	-	-	-	-	3[f]	-
Imports	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tellurium																							
Output	-	-	-	-	100	-	100	-	-	-	-	-	-	-	-	-	-	-	-	-	12[g]	-	-
Reserves	-	-	-	-	100	-	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3[f]	-
Imports	100	-	-	-	-	-	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1981[i]
Rare earths																							
Output	-	-	-	-	-	-	-	100	100	-	-	-	-	-	-	-	-	-	-	-	1[f]	-	-
Reserves	-	-	-	-	-	-	-	100	100	-	-	-	-	-	-	-	-	-	-	-	-	318[f]	-
Imports	97	-	3	-	-	-	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	64[g]
Thorium																							
Output	-	-	-	-	-	-	-	100	100	-	-	-	-	-	-	-	-	-	-	-	1[f]	-	-
Reserves	-	-	-	-	-	-	-	100	100	-	-	-	-	-	-	-	-	-	-	-	-	54[f]	-
Imports	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tungsten																							
Output	2	67	-	-	-	-	69	26	26	-	-	5	-	5	-	-	-	-	-	-	4 443[g]	-	-
Reserves	...	51	-	-	-	-	51	23	23	-	-	26	-	26	-	-	-	-	-	-	-	77[f]	-
Imports	19	-	11	-	-	3	33	-	-	-	-	65	-	65	-	-	-	-	-	3	-	-	57[g]
Uranium																							
Output	100	-	-	-	-	-	100	-	-	-	-	-	-	-	-	-	-	-	-	-	40[g]	-	-
Reserves	...	-	-	-	-	-	...	-	-	-	-	100	-	100	-	-	-	-	-	-	-	225[f]	-
Imports	-	-	-	-	-	1	1	98	98	-	-	-	-	-	1	-	-	-	-	1	-	-	165[g]
Vanadium																							
Output	-	-	-	100	-	-	100	-	-	-	-	-	-	-	-	-	-	-	-	-	9[i]	-	-
Reserves	-	-	-	100	-	-	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1[f]	-
Imports	-	-	4	-	-	-	4	96	96	-	-	-	-	-	-	-	-	-	-	-	-	-	58[g]
Zinc																							
Output	4	6	-	-	57	-	67	5	5	-	2	24	-	27	-	-	-	-	-	-	1 007[f]	-	-
Reserves	...	...	-	-	45	-	45	29	29	-	...	26	-	26	-	-	-	-	-	-	-	15 536[f]	-
Imports	16	-	7	7	-	10	40	55	55	1	-	-	-	2	-	-	-	-	-	1	-	-	158 983[g]

Source: Ing. G.P. Salas, "Preliminary Study of Mineral Resources of Latin America", a monograph submitted at the centennial symposium of the United States Geological Service, 1979.

a/ Metal content. Includes ore, scrap and alloys; ilmenite in concentrates; manganese: ores in the case of Argentina, Bolivia, Chile and Peru.

b/ The total for this subgroup also includes Ecuador, but the corresponding column was omitted because the figures expressed as percentages of the total were not significant.

c/ See note b/ but with reference to Paraguay and Uruguay.

d/ See note b/ but with reference to El Salvador, Guatemala and Nicaragua.

e/ See note b/ but with reference to Barbados, Grenada, Haiti, Suriname and Trinidad and Tobago.

f/ Thousands of tons.

g/ Tons.

h/ Millions of tons.

i/ Kilogrammes.

Table 12

LATIN AMERICA: VALUE OF MINERAL OUTPUT

(Millions of 1970 dollars)

Products	1950	1960	1970	1975	1976	1977
Sulphur	1.02	35.03	39.85	56.89	57.73	45.95
Bauxite	41.16	140.63	276.10	246.71	227.42	243.97
Copper	666.17	1 109.69	1 385.86	1 532.18	1 877.37	2 057.15
Tin	117.51	78.94	123.75	127.22	133.19	136.90
Iron	23.82	176.19	369.76	539.86	478.49	426.97
Manganese	2.49	11.74	25.87	19.22	18.73	...
Nickel	-	38.89	120.76	202.96	200.58	200.11
Gold	72.32	60.85	37.49	45.05	36.85	25.52
Silver	147.53	175.79	191.27	177.94	188.21	202.75
Lead	105.67	117.26	128.03	129.70	125.35	132.79
Saltpetre	64.26	36.02	26.09	28.13	23.97	21.77
Zinc	96.96	137.42	200.91	219.69	253.88	258.69
Subtotal	1 338.91	2 118.45	2 925.74	3 325.55	3 621.77	3 752.57
Total (excluding petroleum and coal)	1 415.77	2 196.63	3 064.93	3 459.51	3 772.41	3 846.15

Source: CEPAL, on the basis of official data.

Table 13

WORLD OUTPUT AND CONSUMPTION OF METALS: FIVE-YEAR AVERAGES

	1951-1955	1956-1960	1961-1965	1966-1970	1971-1975	1976-1977
			A. Output of copper ore			
			(Thousands of tons of metal content)			
Latin America	507.7	658.6	844.7	959.5	1 079.0	1 417.6
Chile	390.0	502.2	588.3	666.7	778.2	1 030.7
Mexico	59.1	59.6	51.8	60.2	76.7	89.2
Peru	35.9	77.5	179.9	204.8	204.3	280.7
Other countries	22.7	19.2	24.7	27.8	19.7	17.1
Africa	626.6	832.8	1 020.6	1 218.4	1 426.4	1 471.5
Asia	129.5	204.1	239.5	305.7	425.5	496.3
Europe	75.0	92.7	93.3	100.9	163.8	180.1
North America	1 093.0	1 264.0	1 551.1	1 787.3	2 186.8	2 166.3
Oceania	32.4	79.8	103.8	120.3	343.4	398.6
Socialist countries	371.1	546.4	813.8	1 119.0	1 576.4	1 821.2
World total	2 835.3	3 678.4	4 666.9	5 611.1	7 201.3	7 951.5
			B. Output of smelted copper (blister)			
			(Thousands of tons)			
Latin America	446.1	594.9	765.7	859.7	905.5	1 204.9
Chile	364.8	473.9	556.7	630.7	658.9	872.4
Mexico	55.4	58.2	47.9	55.7	71.6	79.4
Peru	25.3	61.3	158.8	169.8	171.2	253.2
Other countries	0.6	1.5	2.3	3.5	3.8	-
Africa	594.8	784.1	992.9	1 194.1	1 364.3	1 363.6
Asia	92.1	168.7	286.6	408.1	799.6	897.5
Europe	140.1	175.4	196.8	234.7	352.3	432.5
North America	1 156.6	1 320.0	1 542.4	1 643.5	1 916.6	1 841.6
Oceania	29.4	62.4	79.7	97.1	165.4	170.9
Socialist countries	368.2	549.3	813.5	1 119.3	1 602.2	1 800.2
World total	2 827.3	3 654.8	4 677.7	5 556.5	7 105.9	7 711.1
			C. Output of refined copper			
			(Thousands of tons)			
Latin America	306.5	286.5	336.5	510.4	620.2	917.9
Brazil	-	-	1.6	11.7	29.0	29.9
Chile	256.4	226.9	265.1	411.0	483.5	654.0
Mexico	25.2	29.8	33.9	51.4	63.4	77.0
Peru	23.9	26.3	36.7	36.2	44.3	157.1
Other countries	1.0	3.5	1.2	-	-	-
Africa	269.7	452.4	633.2	790.1	959.4	909.6
Asia	115.3	188.3	334.6	581.5	904.1	990.5
Europe	713.9	837.4	1 006.7	1 136.5	1 216.9	1 391.7
North America	1 529.9	1 799.9	2 127.2	2 260.1	2 407.3	2 [illegible]
Oceania	30.3	56.3	94.2	123.4	180.4	186.6
Socialist countries	467.9	707.1	990.0	1 351.6	1 958.3	2 315.6
World total	3 433.5	4 328.0	5 522.3	6 753.6	8 246.5	8 932.0

Source: Metallgesellschaft Aktiengesellschaft, Metal Statistics, various issues.

Table 13 (continued 1)

	1951-1955	1956-1960	1961-1965	1966-1970	1971-1975	1976-1977
			D. Consumption of refined copper			
			(Thousands of tons)			
Latin America	79.3	86.2	123.5	153.6	274.1	380.6
Argentina	12.5	18.9	20.7	22.3	37.9	38.5
Brazil	23.7	26.0	36.3	54.6	129.7	196.5
Chile	32.2	22.1	36.0	24.0	30.7	47.4
Mexico	10.0	17.4	27.9	47.8	65.4	79.8
Other countries	0.9	1.7	2.7	4.8	10.5	18.5
Africa	22.2	31.7	42.5	40.9	77.4	73.9
Asia	132.5	261.6	473.3	758.3	1 057.0	1 276.7
Europe	1 164.3	1 626.8	1 993.5	2 124.5	2 432.3	2 565.0
North America	1 408.3	1 372.3	1 751.2	2 130.9	2 116.8	2 106.6
Oceania	40.5	58.1	84.6	104.3	117.1	118.0
Socialist countries	543.0	805.3	1 122.4	1 429.0	1 876.0	2 246.7
World total	3 390.2	4 242.0	5 591.1	6 731.5	7 950.8	8 773.3
			E. Output of bauxite			
			(Thousands of tons)			
Latin America	6 747.7	11 000.7	15 171.4	21 393.8	26 147.3	21 166.8
Brazil	24.3	80.2	158.3	339.6	801.5	1 016.7
Guyana	2 331.3	2 116.3	2 554.7	3 837.2	3 791.5	3 226.0
Haití	-	250.1	382.5	529.5	694.4	709.1
Jamaica	1 254.6	4 915.7	7 597.4	9 898.3	13 206.0	10 872.2
Dominican Republic	-	292.0	770.3	999.8	1 037.0	622.4
Suriname	3 137.6	3 346.5	3 708.2	5 789.4	6 616.8	4 720.5
Africa	397.2	746.7	1 971.8	2 779.1	6 028.5	12 283.2
Asia	503.4	997.8	1 826.2	2 921.9	3 940.2	3 754.9
Europe	1 876.1	2 915.2	3 820.4	4 925.1	5 861.9	4 961.2
North America	1 804.2	1 658.7	1 499.1	1 837.0	1 910.2	2 001.2
Oceania	6.0	21.5	477.8	5 640.6	17 152.7	25 076.8
Socialist countries	2 768.4	4 721.0	7 511.5	10 446.3	13 695.0	13 442.0
World total	14 103.1	20 061.7	32 278.2	49 943.8	74 735.7	82 686.0
			F. Output of primary aluminium			
			(Thousands of tons)			
Latin America	1.3	12.1	32.8	117.4	231.2	338.4
Argentina	-	-	-	-	4.5	46.5
Brazil	1.3	12.1	23.6	39.4	104.9	153.4
Mexico	-	-	8.5	26.3	39.9	42.6
Suriname	-	-	0.7	42.0	49.5	51.0
Venezuela	-	-	-	9.7	32.3	45.0
Africa	-	25.1	50.9	125.6	244.8	352.8
Asia	57.1	110.4	280.4	640.9	1 346.5	1 484.5
Europe	448.1	681.9	1 069.6	1 678.8	2 735.4	3 222.2
North America	1 581.0	2 184.1	2 791.9	4 034.1	4 823.6	4 790.9
Oceania	-	10.9	47.9	122.8	303.1	381.9
Socialist countries	352.9	756.0	1 237.8	1 955.0	2 686.4	3 084.5
World total	2 440.6	3 780.5	5 511.5	8 674.6	12 371.0	13 655.1

Source: Metallgesellschaft Aktiengesellschaft, Metal Statistics, various issues.

Table 13 (continued 2)

	1951-1955	1956-1960	1961-1965	1966-1970	1971-1975	1976-1977
G. Total consumption of primary and secondary aluminium						
(Thousands of tons)						
Latin America	24.8	50.3	100.8	194.6	381.2	460.4
Argentina	-	-	-	52.0	90.5	63.0
Brazil	10.5	23.5	20.5	84.7	175.7	254.4
Mexico	4.6	10.0	-	32.2	59.5	64.3
Venezuela	-	-	-	4.6	22.5	46.4
Other countries	9.7	16.8	80.3	21.0	33.0	32.5
Africa	4.1	9.7	26.2	58.1	110.9	135.1
Asia	50.9	127.2	425.1	1 076.8	1 974.3	2 462.5
Europe	610.7	944.1	1 780.1	2 727.3	3 690.2	4 364.2
North America	1 291.8	1 614.5	3 081.7	4 592.6	5 756.1	6 292.5
Oceania	11.3	27.6	63.5	125.1	191.0	222.0
Socialist countries	364.2	741.7	1 443.4	2 323.4	3 252.7	3 989.2
World total	2 357.8	3 515.2	6 920.8	11 097.9	15 356.4	17 925.8
H. Output of lead ore						
(Thousands of tons of metal content)						
Latin America	390.5	398.1	402.9	423.4	466.8	488.0
Argentina	23.0	27.1	28.2	33.8	36.0	33.2
Bolivia	24.3	22.8	18.9	23.0	20.8	18.8
Brazil	-	4.6	16.1	21.5	26.4	21.8
Honduras	-	-	4.3	12.1	20.4	20.9
Mexico	224.1	199.6	183.6	173.5	178.8	181.8
Peru	104.3	128.6	144.9	157.4	170.7	181.1
Other countries	14.8	15.4	7.0	2.0	13.5	30.5
Africa	194.4	225.7	205.3	202.9	190.7	157.5
Asia	57.4	83.7	94.8	115.1	137.5	140.0
Europe	215.0	273.6	262.8	342.5	310.4	312.0
North America	494.5	436.5	450.3	680.6	897.6	815.5
Oceania	260.8	321.4	363.1	410.8	397.9	415.6
Socialist countries	310.5	555.0	783.4	923.3	1 126.8	1 215.5
World total	1 923.1	2 294.1	2 562.6	3 098.5	3 527.7	3 543.9
I. Output of refined lead						
(Thousands of tons)						
Latin America	285.2	288.9	305.0	315.8	321.6	344.1
Argentina	20.1	28.0	31.4	37.7	41.8	47.5
Brazil	-	4.6	13.4	17.9	32.9	46.1
Mexico	206.3	189.2	179.3	178.6	169.4	173.9
Peru	54.4	64.7	80.5	81.3	77.4	76.7
Other countries	4.4	2.3	0.5	0.4	-	-
Africa	67.2	69.2	76.5	130.7	116.5	106.6
Asia	40.0	80.0	121.2	183.7	236.3	240.6
Europe	491.6	700.3	792.7	1 014.8	1 083.2	1 102.9
North America	587.8	655.1	655.2	784.1	927.6	954.2
Oceania	217.0	211.6	218.9	217.3	208.3	215.5
Socialist countries	325.0	561.1	800.7	971.5	1 203.4	1 240.0
World total	2 013.8	2 566.1	2 970.3	3 618.0	4 096.9	4 203.8

Source: Metallgesellchaft Aktiengesellschaft, Metal Statistics, various issues.

Table 13 (continued 3)

	1951-1955	1956-1960	1961-1965	1966-1970	1971-1975	1976-1977
		J. Consumption of refined lead (Thousands of tons)				
Latin America	63.3	78.5	121.4	163.4	196.3	213.1
Argentina	25.0	26.9	32.3	39.0	42.7	45.5
Brazil	21.5	19.2	22.9	24.6	46.8	37.9
Mexico	11.2	24.9	54.9	85.2	87.3	82.2
Other countries	5.6	7.4	11.3	14.6	19.5	27.5
Africa	18.2	23.0	27.7	36.0	57.2	71.5
Asia	53.5	110.4	191.1	248.8	317.5	369.7
Europe	729.8	922.0	1 095.8	1 227.6	1 274.9	1 270.0
North America	752.0	728.3	757.0	932.9	1 048.1	1 040.0
Oceania	45.8	53.0	60.2	71.3	74.8	83.5
Socialist countries	295.0	517.1	710.1	933.5	1 213.7	1 314.6
World total	1 957.7	2 432.3	2 963.4	3 613.5	4 182.6	4 362.3
		K. Output of nickel ore (Thousands of tons of metallic content)				
Latin America	11.1	18.3	24.3	35.5	60.4	66.7
Cuba	9.5	17.0	23.6	34.0	35.9	36.7
Brazil	-	-	0.6	1.5	3.5	5.4
Dominican Republic	-	-	-	-	21.0	24.5
Other countries	1.6	1.3	0.1	-	-	0.2
Africa	1.8	2.8	4.1	11.6	31.3	49.1
Asia	0.2	0.3	1.1	5.6	17.3	41.1
Europe	0.2	0.8	2.7	7.8	18.9	19.5
North America	137.6	173.0	223.1	241.4	265.8	249.5
Oceania	14.6	35.8	50.2	113.9	175.6	201.3
Socialist countries	40.1	54.7	84.3	107.1	125.1	145.3
World total	205.6	285.7	389.8	523.0	694.5	772.4
		L. Consumtion of nickel (Thousands of tons of metallic content)				
Latin America	0.4	0.6	1.3	2.0	6.4	11.1
Brazil	-	-	0.3	1.1	3.6	5.4
Mexico	-	-	-	0.3	1.3	3.8
Other countries	0.4	0.6	1.0	0.6	1.5	2.0
Africa	-	0.3	0.9	3.7	4.7	5.1
Asia	1.8	9.7	25.6	65.6	102.4	114.1
Europe	41.3	66.2	97.9	145.2	172.3	184.8
North America	94.3	103.8	129.3	162.5	171.4	159.1
Oceania	0.5	1.2	2.0	3.3	3.9	4.3
Socialist countries	40.2	57.9	104.4	119.7	149.4	181.1
World total	178.5	239.7	361.4	502.1	610.5	659.4

Source: Metallgesellschaft Aktiengesellschaft, Metal Statistics, various issues.

Table 13 (continued 4)

	1951-1955	1956-1960	1961-1965	1966-1970	1971-1975	1976-1977
			M. Output of zinc ore			
			(Thousands of tons of metallic content)			
Latin America	416.7	446.9	499.7	614.7	794.6	916.4
Argentina	17.4	31.8	29.0	30.1	41.2	39.9
Bolivia	26.4	11.7	7.3	23.6	47.3	56.9
Brazil	-	-	-	4.8	26.0	48.5
Honduras	-	-	7.8	14.0	24.4	25.8
Mexico	225.4	250.3	244.0	244.0	260.0	262.4
Peru	138.6	140.9	208.2	295.9	380.6	465.0
Other countries	8.9	12.2	3.4	2.2	15.1	18.0
Africa	204.2	261.9	264.6	252.0	253.5	247.6
Asia	108.7	167.7	236.5	338.1	414.0	480.9
Europe	395.8	504.0	502.5	581.0	651.6	759.5
North America	872.2	798.9	1 006.0	1 530.1	1 574.9	1 463.3
Oceania	230.5	295.9	344.2	441.0	480.5	480.2
Socialist countries	435.0	706.5	914.5	1 250.7	1 610.4	1 790.9
World total	2 663.0	3 181.7	3 768.0	5 007.6	5 779.5	6 138.7
			N. Output of smelted zinc			
			(Thousands of tons)			
Latin America	76.4	95.2	124.9	171.2	227.8	318.7
Argentina	12.0	14.0	19.3	23.9	36.2	32.1
Brazil	-	-	-	3.9	22.6	45.1
Mexico	54.7	55.8	57.2	79.4	104.2	175.8
Peru	9.5	25.3	48.3	64.0	64.8	65.7
Africa	40.2	80.7	98.5	119.3	180.2	186.2
Asia	84.0	151.0	293.0	611.5	818.4	832.7
Europe	674.0	826.5	917.1	1 130.5	1 427.8	1 524.1
North America	1 075.1	1 078.9	1 165.4	1 347.0	1 057.1	968.1
Oceania	92.1	113.4	173.2	218.5	264.7	245.7
Socialist countries	402.6	636.8	888.6	1 188.6	1 619.9	1 812.3
World total	2 444.5	2 982.6	3 660.7	4 786.5	5 596.0	5 887.7
			O. Consumption of zinc			
			(Thousands of tons)			
Latin America	44.5	62.7	96.9	139.9	212.5	246.5
Argentina	14.9	18.7	21.2	27.8	38.7	35.2
Brazil	14.1	21.3	35.2	45.8	77.9	101.1
Colombia	-	-	2.7	4.8	8.4	9.3
Mexico	11.4	17.4	27.4	41.3	54.1	61.6
Peru	-	-	0.5	3.9	9.7	9.8
Venezuela	-	-	1.5	6.4	9.4	13.5
Other countries	4.1	5.3	8.5	9.9	14.3	16.1
Africa	15.2	25.0	38.0	61.6	89.9	100.8
Asia	115.4	208.8	411.4	683.6	915.3	997.6
Europe	750.9	968.4	1 177.0	1 350.5	1 550.2	1 472.4
North America	911.9	885.9	1 090.9	1 299.4	1 297.5	1 153.1
Oceania	59.0	80.0	95.9	110.0	120.0	98.6
Socialist countries	389.8	568.8	748.1	1 047.2	1 456.6	1 670.3
World total	2 286.8	2 799.5	3 658.2	4 692.2	5 642.0	5 739.2

Source: Metallgesellschaft Aktiengesellschaft, Metal Statistics, various issues.

Table 13 (concluded)

	1951-1955	1956-1960	1961-1965	1966-1970	1971-1975	1976-1978
		P. World output of primary tin[a/] (Thousands of tons)				
Latin America	32.8	24.9	25.2	32.3	35.1	39.7
Argentina	0.2	0.2	0.7	0.8	0.6	0.4
Bolivia	31.9	23.6	22.7	28.7	30.5	31.6
Brazil	0.2	0.6	1.0	2.2	3.6	6.9
Other countries	0.5	0.5	0.8	0.6	0.4	0.7
Africa	25.0	22.6	20.1	21.0	17.0	13.0
Asia	109.5	89.5	94.7	113.8	119.3	120.1
Europe	3.7	2.8	2.4	2.7	4.3	4.4
Oceania	1.8	2.2	3.2	6.9	10.5	10.9
North America	0.3	0.3	0.3	0.3	0.3	0.4
World total	173.1	142.3	145.9	177.0	186.5	188.5
		Q. World output of smelted tin[a/b/] (Thousands of tons)				
Latin America	1.3	2.5	5.7	4.0	12.7	21.7
Argentina	0.1	0.1	0.1	0.1	0.1	0.1
Bolivia	0.2	0.7	2.8	0.5	7.0	13.0
Brazil	0.8	1.2	1.8	2.4	4.6	7.7
Mexico	0.2	0.5	1.0	1.0	1.0	0.9
Other countries	-	-	-	-	-	-
Africa	3.7	4.2	10.0	13.0	9.4	5.9
Asia	72.7	65.9	83.5	112.5	121.7	122.8
Europe	67.1	58.8	40.8	46.9	35.4	29.9
North America	28.7	9.9	6.7	6.5	7.5	7.3
Oceania	1.8	2.1	2.9	4.5	6.9	5.7
World total	175.3	143.4	149.6	187.4	193.6	193.3
		R. World consumption of tin[a/c/] (Thousands of tons)				
Latin America	4.5	5.1	6.1	7.1	8.1	10.4
Argentina	1.5	1.6	1.6	1.8	1.8	1.6
Brazil	1.7	1.7	2.0	2.4	3.2	5.4
Mexico	0.6	1.0	1.2	1.5	1.6	1.6
Other countries	0.7	0.8	1.3	1.4	1.5	1.8
Africa	2.4	2.9	2.7	2.9	3.5	3.9
Asia	12.5	17.2	24.6	30.9	42.1	42.7
Europe	53.9	65.2	67.6	64.5	68.6	62.9
North America	59.1	56.8	62.8	66.5	59.9	56.6
Oceania	2.8	3.5	4.8	4.8	4.6	4.1
World total	135.2	150.7	168.6	176.7	186.8	180.6

Source: International Tin Council, Statistical Yearbook, various issues, and Tin Statistics, various issues.

a/ Excluding the socialist countries.

b/ From 1963 onwards, explicitly including output of primary and secondary metallic tin.

c/ From 1963, explicitly including consumption of primary and secondary metallic tin.

Table 14

LATIN AMERICA: CONSUMPTION AND OUTPUT OF PRINCIPAL NON-FERROUS METALS, 1950-1977

	Consumption (thousands of tons)		Growth rate (percentages)	Primary output (thousands of tons)		Growth rate (percentages)
	1950	1977	1950-1977	1950	1977	1950-1977
Aluminium						
Latin America	21.9	477.3	12.1	-	359.5	...
World total	1 586.3	18 203.4	9.4	1 506.9	14 220.8	8.7
Percentage Latin America/ world total	1.4	2.6		-	2.5	
Copper						
Latin America	61.7	393.3	7.1	480.3	1 500.4	4.3
World total	3 012.6	9 006.5	4.1	2 524.3	8 029.1	4.4
Percentage Latin America/ world total	2.0	4.4		19.0	18.7	
Tin						
Latin America	4.0	10.4	3.6	32.7	37.9	0.5
World total a/	149.1	177.5	0.6	169.1	185.0	0.3
Percentage Latin America/ world total	2.7	5.9		19.3	20.5	
Nickel						
Latin America	0.2	11.8	16.3	0.8	66.8	17.8
World total	157.1	648.7	5.4	148.2	778.0	6.3
Percentage Latin America/ world total	0.1	1.8		0.5	8.6	
Lead						
Latin America	76.0	223.4	4.1	365.7	468.7	0.9
World total	1 873.3	4 449.4	3.2	1 679.4	3 589.9	2.8
Percentage Latin America/ world total	4.1	5.0		21.8	13.1	
Zinc						
Latin America	31.4	251.8	8.0	344.2	936.2	3.8
World total	2 075.8	5 747.8	3.8	2 187.2	6 292.4	4.0
Percentage Latin America/ world total	1.5	4.4		15.7	14.9	

Source: Metallgesellschaft Aktiengesellschaft, Metal Statistics, various issues; International Tin Council, Statistical Yearbook, Tin Statistics, Monthly Statistical Bulletin, various issues.

a/ Does not include the socialist countries.

Table 15

MINERAL EXPORTS OF A NUMBER OF LAFTA COUNTRIES

(Thousands of dollars)

Exports from / Exports to	Argentina		Mineral/Total	Bolivia		Mineral/Total	Brazil		Mineral/Total	Colombia		Mineral/Total
	Mineral	Total		Mineral	Total		Mineral	Total		Mineral	Total	
1961												
Remainder of LAFTA	1 780.6	112 283.6	1.6	1 554.4	5 535.5	28.1	2 710.9	97 190.4	2.8	7.1	7 413.9	0.1
Remainder of world	3 919.6	851 830.2	0.5	62 437.4	70 600.2	88.4	102 458.9	1 305 224.6	7.8	1 535.8	427 050.4	0.4
Total	5 700.2	964 113.8	0.6	63 991.8	76 135.7	84.1	105 169.8	1 402 415.0	7.5	1 542.9	434 464.3	0.4
LAFTA/total (percentage)	31.2	11.65		2.4	7.3		2.6	6.9		0.5	1.71	
1970												
Remainder of LAFTA	15 104.9	365 769.0	4.1	5 563.4	22 061.8	25.2	61 730.3	302 958.9	20.4	676.0	82 098.3	0.8
Remainder of world	21 321.2	1 407 405.0	1.5	192 375.4	207 111.2	92.9	322 065.2	2 436 007.9	13.2	8 480.7	653 558.8	1.3
Total	36 426.1	1 773 174.0	2.1	197 938.8	229 173.0	86.4	383 795.5	2 738 966.8	14.0	9 156.7	735 657.1	1.2
LAFTA/total (percentage)	41.5	20.6		2.8	9.6		16.1	11.1		7.4	11.2	
1978												
Remainder of LAFTA	102 866.3	1 512 889.1	6.8	41 145.4a/	218 182.5a/	18.9	131 405.3	1 619 309.9	8.1	11 850.8	299 276.5	4.0
Remainder of world	152 637.6	4 886 650.8	3.1	334 633.5a/	429 653.6a/	77.9	1 546 992.1	11 039 633.9	14.1	10 263.1	2 558 232.4	0.4
Total	255 503.9	6 399 539.9	4.0	375 778.9a/	647 836.1a/	58.0	1 678 397.4	12 658 943.8	13.3	22 113.9	2 857 508.9	0.8
LAFTA/total (percentage)	40.3	23.6		10.9	33.7		7.8	12.8		53.6	10.5	

Source: LAFTA, Estadísticas de comercio exterior, various issues.

a/ 1974.

Table 16

PROJECTION OF INTERNATIONAL TRADE IN ORES AND METALS TO THE YEAR 2000

(Thousands of tons of fine metal content)

Mineral	Region	Proven reserves at 1978 a/	Output of ores b/	Output of metals c/	Consumption of metals c/	Net exports		Total
						Ores	Metals	
Copper	Latin America	189 445	9 970	7 720	2 425	2 250	5 295	7 545
	Africa - Asia	92 162	4 850	5 662	4 548	-812	1 114	302
	North America, Western Europe and Oceania	179 205	9 431	8 567	12 334	864	-3 767	-2 903
	Socialist countries	51 202	2 695	4 997	7 639	-2 302	-2 642	-4 944
Iron and iron ore	Latin America	53 772 700	629 500	448 000	432 000	181 500	16 000	197 500
	Africa - Asia	44 810 583	524 600	586 000	482 000	-61 400	104 000	42 600
	North America, Western Europe and Oceania	71 696 933	839 400	881 000	961 000	-41 600	-80 000	-121 600
	Socialist countries	53 772 700	629 500	708 000	748 000	-78 500	-40 000	-118 500
Zinc	Latin America	15 536	1 586	1 450	1 450	136	-	136
	Africa - Asia	24 167	2 468	2 723	4 299	-255	-1 576	-1 831
	North America, Western Europe and Oceania	86 311	8 814	8 786	6 280	28	2 506	2 534
	Socialist countries	46 608	4 759	4 668	5 598	91	-930	-839
Bauxite	Latin America	6 026 500	44 018	32 749	6 363	11 269	26 386	37 655
	Africa - Asia	5 691 695	41 572	41 170	25 625	402	15 545	15 947
	North America, Western Europe and Oceania	4 519 875	33 013	41 548	62 529	-8 535	-20 981	-29 516
	Socialist countries	502 208	3 668	6 804	27 754	-3 136	-20 950	-24 086
Nickel	Latin America	23 879	287	287	287	-	-	-
	Africa - Asia	77 148	928	510	462	418	48	466
	North America, Western Europe and Oceania	73 478	884	1 106	853	-222	253	31
	Socialist countries	9 180	110	306	607	-196	-301	-497
Tin	Latin America	1 587	61	61	23	-	38	38
	Africa - Asia	5 654	213	170	101	43	69	112
	North America, Western Europe and Oceania	793	30	50	157	-20	-107	-127
	Socialist Countries	-	-	23	23	-23	-	-23
Lead	Latin America	11 484	781	760	537	21	223	244
	Africa - Asia	17 864	1 215	755	1 741	460	-986	-526
	North America, Western Europe and Oceania	86 768	5 900	4 486	3 860	1 414	626	2 040
	Socialist countries	11 484	780	2 675	2 538	-1 895	137	-1 758

a/ Tables 19 and 20 in the text.

b/ Tables 13 and 14 in this annes and table 21 in the text. Projected on the same scale as the reserves.

c/ Table 13 in this annex.

Table 17

LATIN AMERICA: TOTAL IMPORTED MINERALS AND METALLIC PRODUCTS[a/b/c/]

(Thousands of dollars FOB)

SITC Rev.1		1970	1971	1972	1973	1974	1975	1976	1977	1978
	Total imports	18 420	20 245	23 276	31 516	55 431	58 995	62 678	70 224	77 580
	Subtotal mineral and metallic products	8 780	9 374	10 892	13 967	21 724	25 396	25 245	28 673	32 919
28	Metal-bearing minerals and scrap containing minerals	90	86	87	150	302	382	289	307	388
67	Iron and steel	990	1 006	1 057	1 787	3 982	3 460	2 306	2 669	3 284
68	Non-ferrous metals	370	342	408	591	1 062	856	921	1 062	1 128
691-695	Other products manufactured with metal	490	533	535	636	896	1 186	1 026	1 232	1 457
7	Plant and machinery in the field of transport	6 840	7 407	8 805	10 803	15 482	19 512	20 703	23 403	26 662
	Subtotal minerals and metallic products as a percentage of total imports	47.7	46.3	46.8	44.3	39.2	43.0	40.3	40.8	42.4

Source: United Nations, Monthly Bulletin of Statistics, various issues. Special Tables, "World trade by commodity classes and regions", 1970; August 1976, vol. XXX Nº 8; 1971-1972: May 1977, vol. XXXI Nº 5; 1973: May 1979, vol. XXXIII Nº 5; 1974-1978: May 1978, vol. XXXIV Nº 5.

a/ Including trade with Latin America.

b/ Including Caribbean islands and territories, in addition to countries members of CEPAL.

c/ Figures corresponding to exports to Latin America.