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PROFILE AND POSSIBILITY OF A MULTINATIONAL ORE MARKETING ENTERPRISE: THE CASE OF LATIN AMERICA *

* This study was prepared at the request of the UNCTAD secretariat by Mr. Fernando Sánchez Albavera, UNCTAD consultant. The views in this study are those of the author and do not necessarily reflect those of the UNCTAD secretariat nor those of ECLAC.

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I. GENERAL ASPECTS

1. Co-operation among developing countries in respect of mining activities is particularly important, not only in order to minimize the constant fluctuations in prices on international markets, but also to improve bargaining conditions and to enable existing reserves to be mined.

2. The developing countries control a sizable proportion of the reserves of bauxite (70 per cent), copper (55 per cent), tin (73 per cent), iron (44 per cent) and nickel (55 per cent).

3. The Latin American countries' participation in technical and economic co-operation arrangements is particularly significant, since they control a very substantial proportion of international reserves of non-ferrous ores (bauxite 36 per cent, copper 37 per cent, tin 16 per cent, lead 9 per cent and zinc 10 per cent) and ferrous metals (iron 25 per cent).

4. At the present time, copper, accounting for 54 per cent of regional production, is the main ore produced in Latin America, followed by non-ferrous metals such as zinc (7 per cent), bauxite (6 per cent), silver (5 per cent), tin (4 per cent) and lead (4 per cent).

5. Latin America is a predominantly exporting region, however, since domestic consumption is relatively low, and sizable only in the case of lead resources, of which 43 per cent are absorbed. 1/ The region's supply to the international market is largely unprocessed, which has repercussions on the commercial yield of exports. For instance, Latin America accounts for only 13 per cent of the production of smelted and refined copper, 10 per cent of lead production and 11 per cent of tin production. Regional production of zinc and bauxite amounts to 5 and 2 per cent respectively. These indicators are substantially different in the case of ores and concentrates. Under this heading, the region accounts for 26 per cent of world production of bauxite, 21 per cent of tin and 18 per cent of copper. For zinc and lead, its share in world production of ores and concentrates is 15 and 14 per cent respectively.

6. Most of Latin America's exportable supply is channelled to the developed market-economy countries. Towards the end of the 1970s, 80 per cent of exports were destined for these countries, whereas only 1 per cent went to developing countries. The world trade in ores reflects to a considerable extent the productive imbalances existing in the world economy. The developed economies absorb 67 per cent of world imports, while 69 per cent of their resources are channelled to their own markets.

7. The need to strengthen bargaining power and to elaborate technical and economic co-operation arrangements is becoming urgent in the present decade, since it is estimated that 60 per cent of mining investment will be in developing countries. During the present decade, Latin America is expected to absorb investments of the order of $22,422 million of which 51.5 per cent would be for copper, 22 per cent for bauxite and aluminium and 12 per cent for iron. Investments in lead, tin and silver mining are not expected to exceed 1 per cent of that amount in each case, according to estimates made by ECLA.

1/ For copper, tin, iron and zinc, internal consumption fluctuates between 25 and 29 per cent of regional production.

8. It should also be stressed that the mining countries of the region have established and developed an international marketing infrastructure. Since the cost of that infrastructure for each country is high, it is important to work out arrangements designed to integrate it. Integration is feasible, since the infrastructure for the trade in ores is somewhat similar for the marketing of copper, tin, lead and zinc. An effort in this direction could improve the region's bargaining power significantly. Obviously, co-operation arrangements must be developed in successive stages, since a high proportion of the exportable supply is usually committed over the long term.

A. SITUATION OF MINING IN THE MAIN PRODUCER COUNTRIES OF THE REGION

1. Brazil

9. Brazil is an important consumer of copper in the region. At the end of the preceding decade, apparent consumption of this ore exceeded 270,000 tonnes, some 80 per cent of which was imported. Apparent consumption grew very rapidly during the 1970s from 87,000 tonnes to the above-mentioned 270,000 tonnes. Consequently, imports quadrupled, reaching around 215,000 tonnes at the end of the decade.

10. Official sources estimate that domestic demand for copper concentrates will be approximately 150,000 tonnes in the first five years of the 1990s and approximately 300,000 tonnes at the end of the decade. Brazil is expected gradually to reduce its imports as a result of the development of sources of domestic supply. Requirements of copper concentrates from abroad should be approximately 78,000 tonnes until 1984, when the Mara Rosa deposit and other smaller deposits in the north-east will start to be mined. That will lead to a decline in imports to 33,000 tonnes only.

11. Domestic demand for metallic copper is expected to increase significantly from the second half of the 1990s, from a level of approximately 300,000 tonnes to over 525,000 tonnes at the end of the decade. That would correspond to a growth rate of only 3.7 per cent in the first five years and a sharp rise, equivalent to an annual growth of 10.4 per cent, thereafter.

12. The forecasts are for a decline in imports of refined copper, which are expected to fluctuate between 50,000 and 90,000 tonnes in the course of the decade, compared with imports of 150,000 tonnes recorded at the end of the 1970s.

13. In any event, Brazil will continue to be a copper-importing country, unlike its situation in respect of lead, where there is some prospect of a balance between domestic supply and demand. It is estimated that annual imports of lead concentrates will be approximately 10,000 tonnes throughout the decade in order to supply Brazil's two refineries. A sizable reduction is anticipated in refined lead imports, which are expected to be between 1,000 and 3,000 tonnes annually at the end of the decade.

14. The situation in the zinc market is completely different. Brazil imported between 50,000 and 70,000 tonnes a year during the past decade, and apparent consumption exceeded 150,000 tonnes. Domestic demand is expected, however, to decline in the first half of the decade and official estimates therefore indicate a reduction in imports to 25,000-35,000 tonnes a year.

15. Brazil is gradually becoming a major exporter of tin. For the past decade, there has been a strong growth in domestic supply which has resulted in an increase in exportable balances from 1,100 tonnes to approximately 5,000 tonnes; apparent consumption is of similar magnitude, although in 1981 it fell to only 3,000 tonnes as a result of the problems confronting the Brazilian economy.

16. Official estimates indicate that exports should increase to a level of approximately 25,000 tonnes double the forecasts made concerning domestic demand.

17. To sum up, in the case of Brazil the prospects of devising joint marketing policies for tin and technical and commercial co-operation agreements for lead, zinc and copper are good, particularly in respect of the last two products, for which foreign supplies are needed.

2. Bolivia

18. Bolivia is essentially a country that exports tin, mainly metal, and other concentrated ores such as lead, copper, antimony, zinc and silver.

19. Production of tin concentrates is at present around 30,000 tonnes a year. Production of refined tin has increased substantially over the past decade, exceeding 18,000 tonnes in 1981 compared with a level of approximately 10,000 tonnes in the early 1970s. In recent years, Bolivian refining capacity increased substantially when the installations of the Empresa Nacional de Fundiciones (ENAF) became fully operational. The outcome was a reduction in exports of concentrated tin, which fell from 20,487 tonnes in 1976 to only 5,524 tonnes in 1981, producing a greater value added for Bolivian exports. Exports of metallic tin rose from 9,867 tonnes to more than 15,215 tonnes during the same period.

20. Lead and copper are produced only in the form of concentrates, of which something over 90 per cent is exported. Lead production is of the order of 19,000 tonnes, and has been maintained at approximately the same level over the last six years. Copper production is very small, fluctuating between 2,000 and 5,000 tonnes in recent years. Production has picked up somewhat in the last three years, rising to a level of 3,000 tonnes.

21. After tin, the most important form of mining productin is zinc concentrates, although it has been declining. The production of these concentrates reached a peak in 1979 with 63,000 tonnes, falling to 44,000 tonnes in 1979, increasing to 50,000 tonnes in 1980, and dropping back to only 47,000 tonnes in 1981.

22. Exports of zinc concentrates account for approximately 96 per cent of Bolivia's resources, and approximately 10 per cent of the value of Bolivian exports. After tin, which accounts for 62 per cent, and silver, which accounts for 13 per cent, zinc is the main mineral export. The volume of Bolivia's silver production has been remarkably stable, amounting to approximately 200 tonnes a year. Antimony, both as a concentrate and as a metal, is another important export product. Exports of antimony concentrates totalled some 12,000 tonnes in 1981, 80 per cent of the available supply; those of metallic antimony were approximately 6,000 tonnes, more than 90 per cent of Bolivia's resources.

23. In Bolivia, there is a tendency to export only metallic tin, although a number of complex concentrates are channelled abroad. It is an essential product for the Bolivian economy and is particularly important for working out both regional and interregional co-operation arrangements; so too, albeit to a lesser extent, are zinc and silver.

3. Chile

24. For the past five years or so, annual production of fine copper has exceeded 1 million tonnes. Over 70 per cent of Chilean ore production is refined; blister accounts for 16 per cent and the remainder is in bulk (cement, concentrates, slag and ores).

25. Production comes mainly from large deposits at Chuquicamata, El Salvador, El Teniente, and so on, controlled by the Corporación del Cobre (CODELCO), which is State-owned. Large-scale operations account for 83 per cent of Chile's production and over 80 per cent of the value of exports, which exceeded $1,700 million in 1982, if semi-manufactured copper and exports of scrap are also taken into account.

26. Chile is a net exporter of copper and its by-products (molybdenite concentrates), as well as of certain manufactures and semi-manufactures, all of which accounted for a little more than 53 per cent of Chilean exports in 1981.

4. Mexico

27. Mexico is one of the world's leading silver producers, with approximately 14 per cent of world production. Together with Peru, another important producer in the region, it accounts for 26 per cent of world silver production.

28. Mexican production of silver exceeded 1.6 million tonnes in 1981, a rise of 12 per cent over the preceding year. More than 95 per cent of production is in the form of refined silver and the remainder in impure ingots and concentrates. Seventy-four per cent of the refined silver goes for export, and the main markets are Western Europe, which absorbs 41 per cent; the United States, with 25 per cent; and Japan, with 29 per cent. The main purchaser in the region is Brazil, which acquires approximately 5 per cent of export supplies.

29. Lead production rose substantially in 1981, to over 157,000 tonnes, an increase of approximately 8 per cent over the preceding year. Ninety per cent of national production is refined in Mexico. The main markets for Mexican lead are the United States (21 per cent), Western Europe (29 per cent), Japan (23 per cent) and Latin America (6 per cent). Argentina absorbs about 50 per cent of Mexico's exports within the region.

30. Mexico is also an important copper producer in the region, although on a much smaller scale than Chile and Peru, which are among the world's major producers. Mexican production in 1981 was approximately 230,000 tonnes of fine copper, an increase of 31 per cent over the production of the preceding year. Mexico refines 60 per cent of its production the remaining percentage consisting of ores and concentrates. However, the refined copper is used for the most part in the domestic market and the bulk of exports consists of copper concentrates, which account for 95 per cent of total copper exports.

31. In 1981, zinc production was over 211,000 tonnes, approximately 11 per cent less than in 1980. Fifty-eight per cent of production is refined in Mexico, 30 per cent in the form of concentrates, 5 per cent as zinc oxide and the remainder as zinc sulphate, slag and other forms of impure zinc. Mexico has large-scale exports of concentrates as well as refined zinc, forms of processing which account for 56 per cent and 43 per cent respectively of the exports of this ore. Western Europe, particularly Belgium, absorbs 72 per cent of exports of concentrates and the United States and Brazil 40 per cent and 45 per cent respectively of exports of refined zinc.

32. The Mexican authorities are interested in elaborating forms of horizontal co-operation in view of the cyclical fluctuations of the world market, since together with Peru, Mexico is an important exporter of silver, lead and zinc.

5. Panama

33. Our mission considered it important to make contact with the Government of Panama, in view of the scope of the Cerro Colorado project. This deposit is situated some 260 km to the west of Panama City. The Corporación de Desarrollo Minero (CODEMIN), which is responsible for implementing the project, reports that the ore body contains 1,400 million tonnes of mineral rock with an average quality standard of 0.78 per cent of copper and a vertical quality standard of 0.4 per cent of copper. The main copper ore is chalcopyrite. It also contains small quantities of molybdenum, silver and gold. At present, the project includes mining operation which will extract 39.6 million tonnes of mineral rock a year, followed by a concentration operation to obtain an annual average rate of 1,128,000 tonnes of concentrates with 25 per cent copper in the first five years and 1,040,000 tonnes in subsequent years, as well as some 6,930 tonnes of molybdenum concentrates of 52 per cent per annum. With an initial content of 282,000 tonnes of copper a year, the concentrates could be sold as such or processed in a melter which could be built near Punta Yurre at the mouth of the Santa Lucía river (CODEMIN Report, October 1981). The project's economic impact is of great consequence for the Panamanian economy. CODEMIN calculates that around $500 million a year could be earned directly for the first 20 years of operations as a result of Government participation in 51 per cent of share capital and in taxes, as well as other dividends.

34. Studies on the Cerro Colorado project began in the second half of the 1970s with the co-operation of agencies in the United Nations system. In 1975, an agreement was concluded with Texas Gulf Inc. and CODEMIN was constituted, holding under this agreement 80 per cent of the capital of the company which would be responsible for implementing the project. Texas Gulf took up only 20 per cent, although it also concluded a management contract that assigned responsibility to it for directing and supervising operations. During the period from 1976 to 1978, various studies were conducted and different sources of financing explored, including the World Bank.

35. Towards 1979, the view gained general acceptance that an official participation of 80 per cent in the enterprise might be too great a risk for the Government of Panama. Accordingly, it was decided that its participation should be 51 per cent only. In 1980, an agreement was concluded with Río Tinto Zinc, which took up Texas Gulf's participation and subscribed 49 per cent of the new company's share capital.

36. It is important to stress the various forms of co-operation received by the Government of Panama from a number of countries in the region, particularly Peru, both as regards the purely technical aspects and the aspects concerning negotiations

with transnational corporations. Difficulties have been encountered in financing the project due to the critical international economic situation in recent years, but the studies have continued to make progress and infrastructure projects have been carried out.

37. Senior CODEMIN executives have expressed an interest in promoting forms of co-operation to train experts in ore marketing and in analysing and following up the ores market, a task which they consider should be performed in the forthcoming two-year period.

6. Peru

38. Peru is an important producer of a wide variety of metals in the region, although its large-scale operations are confined mainly to copper.

39. At the end of the 1970s, copper production exceeded 390,000 tonnes, of which 90 per cent was produced in the large mines controlled by the Southern Peru Corporation, a 51 per cent subsidiary of the American Smelting and Refining Corp. (ASARCO) (which controls over 75 per cent of Peruvian production), and by the State corporations of CENTROMIN and Minero-Perú.

40. At present around 51 per cent of Peruvian production is in the form of refined copper, 44 per cent blister and the remainder minerals and concentrates. Refining takes place in the Ilo refinery, owned by Minero-Perú, which has toll contracts with Southern. This enterprise is the only one that produces and exports copper blister, while concentrates come mainly from medium-sized and small mining operations, most of which are privately owned.

41. Lead production exceeded 180,000 tonnes at the end of the 1970s, with large-scale mining (CENTROMIN) accounting for only 36 per cent and medium-scale mining 58 per cent. The latter exports concentrates and supplies the CENTROMIN lead refinery. Forty-nine per cent of Peru's production is refined in these installations, with 51 per cent in the form of concentrates which are channelled to the world market.

42. Zinc production is approximately 490,000 tonnes. Fifty-six per cent of production comes from medium-scale mining and 41 per cent from large-scale mining (CENTROMIN). Until the end of the last decade, refinery production (CENTROMIN) accounted for only 16 per cent of Peruvian production, the remaining 84 per cent being exported in the form of concentrates. The coming into operation of the Cajamarquilla zinc refinery, owned by Minero-Perú, with a processing capacity of over 100,000 tonnes, will produce an amount of refined zinc equivalent to more than 40 per cent of the exportable supply.

43. Silver production is approximately 1.2 million tonnes and the greater part is exported in refined form. The main silver producers are medium-scale miners, who supply the CENTROMIN refining installations on a priority basis.

44. Peru is essentially an exporter of ores, which account for approximately 50 per cent of its exports. The main product is copper, which represents over 45 per cent of ore exports.

45. It should be noted that any trade co-operation scheme concerning copper will shortly have to disregard output from the Cuajone deposit, worked by Southern, since production was committed in the financing agreement until the end of this

decade. Consequently, only some 33,000 tonnes of blister (Toquepala deposit) and some 100,000 tonnes of refined copper (Toquepala, Minero-Perú and CENTROMIN) have not been committed. There are no such restrictions on lead, zinc and silver, although since the State monopoly on ore marketing was ended in 1981, private producers have shown greater flexibility. Despite this, official sources estimate that Minero-Perú Commercial (MINEPECO) is currently marketing approximately 80 per cent of Peru's mineral exports.

B. POSSIBILITIES OF HORIZONTAL CO-OPERATION

46. Latin America may be viewed as a "pilot" region for testing co-operation arrangements. It is a region typical of those with a wide variety of metals; it plays an important role in international commerce and is strongly affected by trends in the world ores market. The mining countries of the region have a number of common interests. They range from improving the sources of trade information, since a large proportion of production (ores and concentrates) is channelled to markets that can be described as a "discriminatory monopoly", to matters connected with negotiating exploitation contracts with transnational corporations, and the need to replace international intermediaries and to diversify seller's markets as well as to stand up to protectionist pressures affecting exports of semi-manufactures.

47. There are important copper, iron and tin mining interests common to more than two countries of the region. Brazil, Chile, Peru and Venezuela control nearly 100 per cent of exports of copper, 90 per cent of those of iron and 99 per cent of the regional sales of tin. Moreover, Peru and Mexico form an important exporting power for iron, silver and zinc, together with Bolivia, which exports on a smaller scale. Those countries control 68 per cent of the region's silver exports, 95 per cent of its lead exports and 94 per cent of its zinc exports.

48. Possibilities of horizontal co-operation arise not only from the fact that one or more countries constitute an important exporting power, but also from the State's very important role in ore production, which makes it easier to identify those involved at the national level.

49. This report places particular emphasis on identifying such agents of co-operation and on analysing the existing forms of marketing, in order to clarify the bases for co-operation arrangements that are important for strengthening the capacity to bargain in international trade.

II. BASIC ASPECTS CONCERNING THE MARKETING OF ORES

50. Ore transactions are classified according to the extent to which the products have been processed. The marketing of refined products presents no great complications, since once the international reference rate has been decided, it only remains to negotiate the quotational period, the form of payment and the method of delivery (FOB, CIF, and so on).

51. The most important aspect to be worked out in a sale of refined products is the quotational period. It generally takes into account average pricing on the basis of the contractual month of shipment, it being possible to negotiate a fixed price in the event of immediate operations. It is normal, in short- and long-term operations to calculate average prices, although it is a recognized practice to grant what are known as "pricing facilities". This method is used mainly in marketing copper. Under this system, buyers work out prices taking one or two months as the reference period. During this period, it is usual to agree on daily and weekly maximum prices in order to work out the quotation for fractions of the shipment. The usual procedure is to set a maximum daily rate of 25 per cent and a weekly rate of between 50 and 60 per cent for the shipment. This clause has been considered disadvantageous by the CIPEC countries, since in the end it usually favours the purchaser. 1/

52. The reference rates are recognized internationally. They are set in stock exchange transactions. The most important stock exchanges are the London Metal Exchange (LME), the New York Commodity Exchange (COMEX) and the Chicago Mercantile Exchange. There are also dealers' prices, producer prices and scrap market prices. On the United States domestic market, the US Producer Price (USPP), which until a few years ago was fixed by agreement, is often applied, but the COMEX rate is applied mainly to imported materials. Sales to other countries are usually concluded taking the LME rates as a reference, although in the case of zinc the European producers' price, (GOB) is often used. Although silver is quoted on the LME, the quotation of the London Bullion Brokers or the Handy and Harman refinery in the United States is commonly taken as the reference.

53. The marketing of ores calls for a certain infrastructure, particularly in the case of concentrates, whose marketing is more complex than that of refined products, due to the fact that not only international reference rates, expressing the value of a refined product, but also factors related to the composition of the concentrate and the cost of converting it into a refined substance contribute to valuing them.

54. With regard to trade infrastructure, the storage of the substance is a vital aspect of marketing ores and concentrates. The location of the warehouses is important. They are set up in the exporting ports. Consignments of a volume suitable for export are accumulated in the warehouses and a number of activities are carried out, such as weighing and sampling, that are essential in order to

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1/ Some CIPEC studies reveal that when there are sharp fluctuations in prices, these clauses are harmful to the seller. For instance, a specimen comparison carried out by CIPEC for the first four months of 1980 showed average prices to be £27 per tonne lower than the average monthly London Metal Exchange price. See CIPEC, Resultados del Cuestionario sobre las Condiciones de Ventas, July 1980.

determine the degree of humidity and the quality of the concentrate. The quality of the concentrate is ascertained by sending samples to internationally renowned laboratories and comparing them with the analyses made by the producers, all of which is necessary to calculate the producer's settlement price (exchange of assays). 1/

55. The process of marketing concentrates and ores begins on their arrival at the warehouse. The first act is the weighing, which can be performed either on the railways or on the warehouse's weighing machine. What is involved is determining the net weight, namely, the difference between the gross weight and the tare weight (the weight of the means of transport). There are a series of lesser, but important problems, which need not be mentioned in this study. They may cause variations in the weight of the product received and introduce distortions. 2/

56. The product is placed in "cochas" (areas specially marked out to form a particular dimension) selected according to the size of the consignment. It is important to avoid contaminating consignments in the warehouses. This may happen, among other reasons, as the result of faulty handling which may mix up consignments from different producers, or when consignments may be mixed with another kind of substance due to unclean "cochas".

57. It is vital to avoid contamination, since in marketing concentrates the quality of the material delivered by the producer is relevant in determining its value. It is also relevant to the type of agreement made by the seller with the melters who demand a product whose technical specifications have been agreed by contract. If the seller offers a substance containing certain impurities and changes what he has offered, his reputation will be severely affected. When this happens, the profitability of the consignment exported is a matter of concern to the seller, since he may be compelled to pay for separating and cleaning.

58. Concentrates and ores must be stored inside the warehouse with climatological conditions in mind. In ports like Callao, in Peru, a substance must be prevented from drying out too much, and is therefore sprinkled with water in order to prevent dust; an effort is made to maintain a constant degree of humidity of between 4 and 6 per cent.

1/ The exchange of assays consists of exchanging the analyses of the contents of the concentrates tested by the producer in the port of embarcation and by the purchaser in the port of destination. If the purchaser has representatives, the exchange is effected in the country of embarcation. Otherwise, certified letters are sent. The contracts establish the differences which may exist in the results of the respective analyses and which are permissible. If the results do not exceed these limits, the results obtained by both parties are averaged out to obtain the final content. If there is a considerable difference, the dispute is referred to a laboratory. Internationally recognized laboratories include Ledoux and Company, Alfred H. Knight Ltd. and John Banks Laboratories Inc.

2/ A common example is the problem of determining the tare weight of the truck and another example relates to humidity. Sometimes humidity can be as high as 10 to 14 per cent. This distortion changes the real weight of the product.

59. The degree of humidity is relevant in marketing minerals and ores. These substances are considered to be suitable for export if humidity does not exceed 8 per cent. Unless concentrates contain this percentage of humidity they must be kept in the port until they do. 1/ The consistency of the substance is another important consideration. If it is very compact, it must be softened. The temperature of the substance must also be taken into account, since it is dangerous and unacceptable for the shipowner to take on board substances with a temperature in excess of 30°C. If the substance is one that tends to become heated, regular checks must be made in order to cool it prior to shipping it.

60. A sampling of the substance is therefore essential in order to determine volume and quality. For the purposes of this report, there is no need to go into further details; 2/ it is enough to point out that the purpose of the sampling is to serve as the basis for payment of the contents. 3/ The samplings are despatched to internationally recognized laboratories, in order to avert possible disputes. Producers commonly demand that the "assays" should be made within not more than five days after the sample has been sent to the laboratory, in order to ascertain the results quickly and to speed up the preparation of the provisional or final settlement.

61. In the ore and concentrates trade, the usual rule that the seller draws up the invoice for the substance acquired by the buyer is inverted. It is the purchaser who prepares the price of settlement for the seller. In order to prepare the settlement it is first necessary to determine the weight of the substance sold (humid gross weight, tare weight, humid net weight, shrinkage, humidity, dry net weight); the standards of quality for the payable contents and the impurities to which a penalty is attached; and the quotations applicable to payment of the contents.

62. The value of a concentrate is ascertained by discounting from the international reference rate the deductions for the cost of processing and impurities and for metallurgical losses. The value of a concentrate is equal to the value of the main content, less deductions for metallurgical loss multiplied by a factor derived from the difference between the international reference price and the refining charges. Processing costs and costs incurred by impurities are subtracted from this amount and credits for by-products are added to it.

63. Contracts usually include adjustment factors for refining charges and processing costs. This is due to the tendency of foundries to enter into long-term contracts in order to be able to rely on a suitable and stable supply.

1/ Concentrates containing higher degrees of humidity tend to shift and endanger the stability of the vessel.

2/ There are various kinds of sampling. The most common is that called "quarter sampling". Consignments of up to 20 tonnes are sampled up to 100 per cent by this method. Larger consignments are sampled up to a certain percentage agreed with the producer. Consignments with valuable substances containing gold and silver are usually sampled up to 100 per cent.

3/ It is common practice to mix in order to improve the quality of the concentrates and obtain a higher commercial yield.

Official indices of the purchasing country concerning wages, fuels, and so on are commonly used for this purpose, and variations in the international reference price are taken into account. It is current practice, when the variations in the international price are used, for the melters to benefit when the price rises and not to suffer when it falls.

64. An important aspect of the marketing of concentrates and ores is the exchange of assays. In the case of FOB or CIF port of unloading purchases, it is usual for the producer to accept the quality standards established on the base of the exchange between the exporter (he may be a trader) and the purchaser. In this case, the quality standards of the place of destination are accepted, whereas in warehouse sales the local quality standards are accepted. The quality standards that are established are those that determine the contents for which payment will be made. It is normal, after sampling (sale in warehouse) or loading (FOB, CIF) for the provisional settlement to be issued. This settlement is based on provisional quality standards and current prices when the settlement is made. Usually the average price of the week preceding the date of settlement is used, although sometimes the price on the day of the issue of the settlement is taken. The usual practice is to take the lowest price of either option, since it generally stands between 80 and 90 per cent of the value of the provisional settlement and it might happen that the balance does not cover possible differences between the assays and variations in the quotations.

65. The final settlement is issued by the buyer when the weights, quality standards and final quotations are known. In the case of sales abroad, one of the following variants is generally used as the quotational period for final settlement: average of the month of shipment, average of the month following the month of shipment, or average of the month following the month of arrival at the port of destination.

66. It is common practice for international traders or development banks to grant credits to producers to enable them to cover production, processing or transport costs. These credits are covered or should be covered by the provisional settlements, since the practice is that they should be for an amount not in excess of 60 per cent of the substance to be marketed. This method is used by small and medium-sized mining concerns, at interest rates linked to the New York "prime rate", plus commissions.

67. It is important to make some reference to certain aspects related to the methods of payment and chartering. Strange though it may seem, letters of credit are not normally used in the ore trade. They are used only when the seller distrusts the buyer or in the case of transactions involving very large quantities, or when transactions are being carried out with countries whose economic system is different. The usual practices are followed with regard to chartering. Charters, according to the place and needs, are negotiated with regular steamship lines and with specially contracted vessels. The conditions for contracting charters are laid down by the regular shipping lines' Conferences, by routes (the European Conference, the Japanese Conference, the North Pacific Conference, the Atlantic Conference, etc.). Space is reserved under the usual conditions (liner terms, FIO, FIOT, and so on).

68. To sum up, the trade in concentrates and ores is substantially different to that in refined products and is considerably more complex. The difference resides in the fact that, for the former, the market is less competitive than

for the latter, since the concentrates market is a discriminatory monopoly, because of the existence of a few enterprises that control the capacity for melting and refining throughout the world and because of the unequal treatment accorded to sellers that hinges on their level of commercial information.

69. The trade imbalances in the world mineral market depend on the development of the mining-metallurgical structure of the producer countries.

70. Consequently, it has been a common objective of the producer countries to increase the value added of their exports in order to gain access to more competitive markets, as in the case of refined products and semi-manufactures.

III. CHANNELS OF ACCESS TO THE WORLD MARKET AND POTENTIAL AGENTS FOR CO-OPERATION

71. The channels for ore marketing take the usual forms in the world market. Foreign enterprises sell their exportable supply either directly or through subsidiaries or affiliates.

72. In Chile, as in Bolivia, the largest of the major mining firms are State-owned (CODELCO, COMIBOL, ENAF, etc.). In Brazil, tin mining is privately owned (Brascan Cia., Estanifera, etc.), as is the case of lead, zinc and silver in Mexico (Peñoles, ASARCO Mexicana). Peru has a mixed system in which the State, through CENTROMIN and Minero-Perú, controls 15 per cent of copper production, 1/ 35 per cent of lead production, 26 per cent of silver production and 40 per cent of zinc production.

73. The prevailing attitude in the above-mentioned countries is that the State enterprises should themselves alone market their output. CODELCO has been doing so since total nationalization in 1971, whereas MINPECO of Peru only markets exclusively the output of the State-owned enterprises CENTROMIN, Minero-Perú and Hierro-Perú. In Peru, ore marketing was a State monopoly between 1971 and 1981. At present, MINPECO competes with private trading enterprises in marketing what remains a very significant part of national output, not only because the State is very important in Peruvian mining but also because undertakings from previous years are still in force (in the case of zinc, for example).

74. In the region, there is a very wide range of private enterprises which act as trade intermediaries. There is the traditional "trading company", which buys on its own behalf and makes up exportable lots, profiting from the difference between the buying and selling prices. These trading companies are not interested in the price level as such but rather in the size of the price difference, in order to maximize their trading profits. As a rule, the international trading companies (Phibro, Marc Rich, Tennant, etc.) have their own national warehousing network in which they build up export lots, taking advantage of the mix of concentrates. They engage primarily in the sale of concentrates rather than refined products, although they participate actively in tenders. Trading companies unquestionably fulfil an important function. Foundries and refineries turn to them when they have supply problems, as do producers with excess supply. There are even major consumers who are supplied solely by internationally recognized traders. It is very often impossible to gain access to some markets or open up new markets without the assistance of such intermediaries. Some of them also provide working or investment capital for the mining companies, thus ensuring future supply.

75. There are also representatives of foreign firms who make purchases on behalf of those firms. They may represent either direct consumers or intermediaries. Representatives are interested in buying on the best possible terms, as the price obtained constitutes the measure of their efficiency as buyers. In addition, there are commercial agents who obtain purchase offers for ore producers and earn a commission. These agents are interested in obtaining the best sales terms and conditions, as their incomes derive from a commission on the value of exports.

1/ Southern Peru, an ASARCO subsidiary, controls 75 per cent of copper production.

76. State marketing has come under fire in Peru in the recent past. MINPECO bought mining products in two ways: direct purchases or "back to back" transactions. In the former method, the enterprise gave the mining company definite purchase terms and conditions, and took on the risk of fluctuations in the world market. In the case of "back to back" operations, MINPECO transmitted to the producer the terms and conditions offered by purchasers in the world market. Under this method MINPECO did not shoulder any risks, although it was interested in obtaining the best terms as it charged a commission for its services, amounting on average to 1.7 per cent of the FOB value of exports.

77. MINPECO also carried out "toll" operations (Peñoles in Mexico, Outokumpu in Finland), for which it directly purchased concentrates to process them in plants abroad. The purpose of these operations was to increase the value added of mining production, overcome some protectionist barriers and have stocks available abroad for spot sales. In addition, it sometimes concluded agreements with other sellers to supply clients with ores stocked near the warehouses of destination in order to save on shipping costs. These operations are known as swaps in the ore market. 1/

78. The criticism made by private producers of the ore marketing monopoly in Peru centred on aspects relating to the marketing margin charged; the weak external marketing structure; excessive delay in settlement; and the lack of suitable co-ordination with producers, who did not participate in any decision-making body within MINPECO but had to accept the terms and conditions it offered. 2/

79. In fact, before the existence of the State company the profit margins of the intermediaries, particularly the trading companies, were not known; and agents charged between 5 and 7 per cent of the FOB value of shipments. To some extent, the criticism concerning the sales infrastructure was justified. MINPECO had offices in New York, London, Sao Paulo and Beijing, but basically worked through agents. Its offices could not actually close deals, like CODELCO, and in practice it was the purchaser who went to MINPECO rather than the latter going to the market. Likewise, the criticism concerning delays in the payment of provisional settlements, which affected the producers' liquidity, was justified, as was the criticism regarding the lack of co-ordination with producers: not so much for reasons concerning the State company as for the rejection of the monopoly.

80. The MINPECO experience is very important in connection with the idea of a multinational ore marketing enterprise, as it is the first ore-mining monopoly in the region. The aim would not, of course, be to establish a multinational enterprise as an exclusive channel, but the references to MINPECO, which would be a possible partner, are relevant for the purpose of correcting problems and overcoming difficulties.

81. In the case of Bolivia, State marketing has also come in for criticism, fundamentally from the medium-sized and small-scale miners who are in favour of free marketing. At present, COMIBOL is responsible for marketing concentrates, and ENAF for refined products. In the former case, foreign foundries are at present taking only complex materials (ENAF does not recover silver). Its main clients are Capper Pass and Gulf Chemical, and it also sells to traders, chief among which is Marc Rich. The medium-term trend is towards a sharp decline in exports of concentrates.

1/ In a swap arrangement, two sellers agree that the seller located nearest the client send goods from his own stocks but in the name of the company which signed the contract.

2/ Producers do now sit on the Board of Directors of MINPECO.

82. ENAF uses a variety of methods for marketing refined products: it operates with agents and sales correspondents, as well as carrying out direct sales. 1/

83. Agents carry out all marketing operations, for which service they charge a commission ranging between 0.3 and 0.6 per cent of the FOB value of shipments. The main agents in operation are Metal Chemic, Phillip Brothers, Marc Rich and Berisford Metal. At present, about 40 per cent of sales are carried out through the agency contract system, and it is estimated that such agents are responsible for 30 per cent of total transactions.

84. Direct sales take place basically with socialist countries and Latin America, although they also take place with the United States.

85. It is considered in mining circles that marketing channels should be improved and above all that experts should be trained to operate on the exchanges and to protect trading earnings from currency fluctuations.

86. The Mining Bank (BAMIN) also carries out trading operations for the small-scale mining enterprises.

87. In Chile, as mentioned earlier, the main marketing enterprise is CODELCO, which controls 94 per cent of copper exports, although the Disputada Mine owned by Exxon should become important in coming years. It is estimated that only 10 per cent of Chilean copper is handled by international traders. The latter generally participate in the tenders called for by CODELCO for spot sales. CODELCO has business offices in London, New York and São Paulo. It has toll arrangements with some refiners in the Federal Republic of Germany and France, and a copper products factory jointly owned with interests in the Federal Republic of Germany.

88. In Mexico, the mining sector is basically private. One of the biggest enterprises is the Consorcio Industrial Minera México SA, in which the American Smelting and Refining Company (ASARCO) holds 30 per cent of the shares (ASARCO previously controlled 49 per cent of the company, which was then called ASARCO Mexicana). The Company has interests in copper, lead, zinc and silver production, through associated companies such as Minerales del Norte, which produces lead and zinc, and Zinc de México. Major copper companies are Compañía Minera Cananea, which processes copper up to the blister stage, and Mexicana de Cobre, which controls the Caridad mine and produces copper concentrates.

1/ Agents have the power to conclude sales contracts. Correspondents only act as contacts, and cannot close deals, which is done by ENAF.

89. In lead and zinc, San Francisco del Oro SA and Compañía Minera Fresnillo SA are major companies. In silver, one of the biggest producers is Compañía Minera Las Torres SA; other major companies are Compañía Real del Monte y Pachuco SA, Minas de San Luis SA, and Compañía Minera Fresnillo.

90. A very important company is Metalúrgica Mexicana Peñoles, which refines lead, silver and zinc on the basis of concentrates. This company had a toll contract with Minero-Perú Comercial for the processing of refined lead.

91. In Brazil, the private sector is very important in tin production. The biggest companies are Cía. Estanifera do Brasil, which is 96 per cent owned by Brascan of Canada. The latter also has a very large share in Mineraçao Brasileira SA and Cía. de Mineraçao Jacunda. Another important group, owned by local private enterprise, is the Paranapanema group which controls Mamoré Mineraçao e Metalurgia and other smaller companies. Finally, other major companies are those of the Brumadinho Group, Best-Metais e Soldas/Cía. Industrial Amazonense of the local Best company group and Cía. Industrial Fluminense and Cía. de Estanho Minas Brasil, which are United States-owned.

92. The main companies in lead production are linked with Peñarroya of France, through its subsidiary Sociedade Paulista de Metais. This subsidiary controls the Companhía Brasileira de Chumbo and through it Mineraçao Boquira SA and Plumbum SA.

93. In the case of zinc, there are major Brazilian groups such as: Gondin-Barreto, which controls the Companhía Mercantil e Industrial, and the Votorantim Group which controls the Companhía Minera de Metais. The Peñarroya Group has interests in Mineraçao Boquira, which also produces zinc.

94. The State has a major interest in copper through the control of companies such as Companhía Brasileira de Cobre and Caraiba Metais. It also controls the Companhía Brasileira de Zinco, which produces copper and zinc, and Mineraçao Morro Agudo, SA, which produces lead.

95. In sum, in the cases of Bolivia, Chile and Peru, State-owned companies have a dominant role in non-ferrous ore mining, whereas in Mexico and Brazil the private sector predominates. In the case of the former, the potential agents for co-operation are COMIBOL, ENAF, CODELCO, CENTROMIN, MINPECO and MINERO PERU; while in the latter case, it will be necessary to identify the private agents concerned through the mining-metallurgy industrial associations.

IV. RECENT CONDITIONS OF SALE IN THE MARKETING OF NON-FERROUS MINERALS

A. Copper

96. The duration of contracts, whether for concentrates or for blister and refined copper, varies considerably. In the case of Chile, the most recent experience shows that only 15 per cent of sales took place under "spot" arrangements; 65 per cent of contracts had a duration of one year and the remaining 20 per cent more than one year. In Peru, marketing is predominantly through long-term sales: 15 per cent of supply goes to sales for a period of less than one year, 34 per cent for sales ranging from one to five years and 51 per cent for contracts of more than five years.

97. The general tendency is to keep between 15 and 25 per cent for "spot" operations in order to take advantage of market fluctuations. These sales are effected through direct contact with consumers or traders who need material urgently. In recent months, however, the poor market conditions have led to a tendency to invite bids. In the case of unrefined products, long-term contracts are commonly signed, since the purchasers (refineries) are concerned to ensure a stable supply. Naturally, the specific terms are generally negotiated from year to year. In the case of refined products, the tendency is to accord priority to short-term contracts. Nevertheless, everything depends on market conditions and on commercial commitments linked with the financing of investment capital or labour.

98. The great majority of sales currently take as a reference the Copper High Grade quotation of the London Metal Exchange (LME), both for high-quality cathodes and for wirebar.

99. A substantial part of Chilean sales include "pricing facilities". In recent years almost 90 per cent of Chilean copper exports were carried out using this method. On the other hand, in Peru sales have usually been made at the average price of the contract month. In the case of wirebars, negotiations take place at the average price for a month; in the case of blister, a little over 80 per cent at the average price for two months; and in the case of concentrates, 94 per cent at the average price for one month.

100. The use of "pricing facilities" has given rise to lengthy discussion within the CIPEC Marketing Policy Committee. Its recommendations have tended to encourage the use of average prices rather than such facilities.

101. However, very often these facilities are stipulated in commercial contracts linked with the financing of projects, as in the case of the Cuajone deposit in Peru. Where it would be difficult to remove these clauses, it has been recommended that premiums should be negotiated for granting them.

102. In recent years, the pricing facilities clause has been used basically in the marketing of refined copper products. Thus, the CIPEC countries used the clause in 58 per cent of sales of electrolytic cathodes and 55 per cent of sales of wirebars. The recommendations of the CIPEC Marketing Committee have been acted on by member countries. Thus, it may be seen that in recent years these facilities have been applied using internationally recognized quotations and premiums. At present, only a small volume is sold without premiums.

103. Broadly speaking, a rejection of the use of pricing facilities is beginning to prevail in CIPEC, in favour of average prices usually corresponding to the contract month of shipment.

104. Contracts commonly provide for provisional settlement. In the case of Chile, it is estimated that 100 per cent of contracts include this method: settlement is made either on arrival at port of destination or five days before. In Peru, it is applied in over 80 per cent of contracts, payment being made on arrival of the shipment.

105. In the case of concentrates, a payment of between 90 per cent and 100 per cent of the provisional settlement is usual. The same is true in the case of blister. In the case of refined products, a payment of 100 per cent is normal.

106. The currency of payment naturally depends on the destination of the shipments. As most of the exports from Chile and Peru go to the United States or Western Europe, the currencies of payment are dollars, sterling or other strong currencies.

107. All sales contracts include "force majeure" clauses to cover the exporter against risks stemming from unforeseen production stoppages or other circumstances beyond the producers' control.

108. Occasionally, as in the case of Chile, contracts include clauses prohibiting resale, which is not the usual practice in Peru. There are also some clauses concerning the substitution of brands by equivalent products, thus making it possible to carry out swap operations to save on shipping costs or take advantage of customs tariff concessions.

109. Some remarks are called for on specific aspects of the conditions of sale of unrefined copper. Copper concentrates are paid for not only on the basis of their copper content but also for their silver and gold content. The copper content is paid for in full, after deduction for metallurgical loss which varies between 1.1 units and 1 unit. 1/ For silver, payment ranges between 90 and 100 per cent, with a deduction for metallurgical loss varying between 30 and 31 grammes; a similar percentage applies to gold, with an average deduction of 1 gramme.

110. An important aspect concerns discounts and penalties. It is accepted that a concentrate containing 0.3 to 0.5 per cent of arsenic may be processed by any refinery in the world. The ceilings for impurities not subject to discounts, according to CIPEC, are 1 per cent for arsenic (As), 4 per cent lead (Pb) and 1 per cent for antimony (Sb). In the case of arsenic, as a rule penalties of between $US 0.50 and $US 1.50 are charged for every 0.1 per cent over the deduction-free permissible ceiling.

111. In the case of blister, the silver and gold content is also paid for after deduction for metallurgical loss. The copper content is paid for in full, with an average metallurgical loss deduction of 0.25 units; between 90 and 100 per cent

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1/ Units express percentages. For example, the copper concentrate content of a lot ranges from 25 to 26 per cent of the total. One percentage unit is deducted from 25 to obtain 24 per cent as the payable content.

of the silver content is paid for, with an average deduction of 25 grammes per tonne; and the gold content is paid for in full, with a deduction of 1 gramme.

112. It has not been possible to obtain specific information on processing charges. Nevertheless, recent international averages in the case of concentrates have varied between $US 70 and $US 90 per tonne. In the case of blister, processing charges stood at between $US 80 and $US 130 per tonne. In both cases the negotiation of refining and processing charges is a fundamental matter as it is this deduction which determines the real sales price of unrefined products.

113. An aspect connected with unrefined products concerns toll operations. 1/ Such operations have been more temporary than permanent. The objectives pursued have been to increase the degree of processing in exports. Latest CIPEC experience shows that toll operations were carried out for 50 per cent of spot sales of concentrates and 40 per cent of long-term contracts for electrolytic cathodes.

114. To summarize, copper marketing operations in Chile and Peru follow the usages and customs of the international ore trade, with a great difference in the case of pricing, as a result of the greater use of pricing facilities in Chile.

B. Lead

115. Broadly speaking, the lead marketing contracts in force at the time of writing of this report are characterized by a preference for long-term arrangements, with regular deliveries in the case of concentrates, because foundries and refineries are concerned with ensuring supply. In the case of refined products, it is common to set aside a certain quantity for spot sales, although trading policy is aimed at securing stable clients. Spot sales contracts aim to take advantage of favourable market situations. Recently, in Peru producers have opted for tendering as the predominant method of sale. In these cases, international traders have been very active (Marc Rich, Phibro, Tennant, Sudamericana de Metales, etc.).

116. Contracts for the sale of lead concentrates clearly stipulate the "brand" (specific mine), giving details of the quality of the ore required and specifying the contents and the permissible variations in them.

117. The most important point of negotiation in this case is the processing charge. 2/ Contracts specify the amount of that charge, with an adjustable scale usually relating to variations in the international reference price. 3/ It is customary to increase the basic processing charge if the international price rises, and vice versa: these charges therefore mean that the purchaser is concerned with international price variations. Lead concentrates in Peru have a high silver content and are highly rated in the world market. Contracts also specify the processing charge applicable to that silver content.

1/ The hire of plant to process a concentrate or blister in a foreign refinery against payment of the cost of processing.

2/ This is the cost of transforming a concentrate into a refined product.

3/ These may be the LME quotations, the European producers' price or the North American producers' price.

118. Current contracts stipulate payment of 95 per cent of lead content, with some deductions relating to the LME quotation. When concentrates are exported to the European market, the zinc content is usually paid for at the GOB price or European producers' price, the payment ranging between 50 and 60 per cent of the content. Silver is paid for at a rate of 95 per cent, according to the Handy and Harman or London Bullion Brokers' quotation, if the product is destined for the United States or Europe, respectively, and deductions are also made. Payment for gold is 100 per cent, and for copper 25 per cent.

119. The quotational period for lead concentrates is usually equivalent to the average of the month following the date of arrival at port of destination. Usually, the buyer pays the seller 80 per cent of the estimated value of each lot shipped on the basis of the assays made at the port of departure. This settlement is generally made on receipt of the shipping documents (bill of lading, etc.). The final settlement to the producer is made when the product meets the required specifications following analysis at the port of destination.

120. Contracts contain force majeure clauses covering unforeseen circumstances as well as aspects relating to arbitration in case of commercial disputes.

121. Trading contracts for refined lead products are not highly complicated. They specify the quality (99.99 per cent pure lead), the sales price in the case of a spot contract and the quotational period, which may be the average for the week preceding the date of shipment. In recent years, Peru has managed to sell refined lead in the Latin American market and the socialist countries at a premium over the LME quotation. In the case of sales to the United States, it has applied discounts to the North American producers' price.

122. It is worth stressing the toll contract concluded between MINPECO of Peru and Peñoles of Mexico in order to increase the processing of refined lead.

C. Zinc

123. As with any contract for the sale of refined products, current contracts stipulate the quality of the product (Special High Grade Zinc, 99.99 per cent pure, in 24 kg ingots quoted on the LME), the amount, the place and date of delivery, and the sales price, specifying a quotational period in the case of long-term sales (average of the week prior to the date of shipment, or otherwise).

124. Concentrate sales contracts are naturally more complicated. They stipulate the quality (concentrates from mine X), the quantity and the contract period. In the case of a long-term contract involving regular deliveries, a period is established for renegotiating the clauses of the contract.

125. With regard to prices, it is customary to pay for 85 per cent of the zinc, with a minimum deduction (8 units, for example) from the international reference price. Silver content is paid with a deduction of 5 ounces per tonne, at a rate of a given percentage of a reference price (60 per cent of the lowest London Bullion Broker quotation, 1/ for example). The cadmium content is paid

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1/ The London Bullion Broker quotation is given by the London Silver Bullion Trade Centre.

for following a deduction of 0.2 per cent, the remainder usually being paid at an average of the four free market prices published in the Metal Bulletin. In the case of silver and cadmium content, contracts frequently stipulate that if the quotations do not reflect market conditions other methods of valuation may be sought.

126. A base cost is usually established for processing costs (at present the market establishes $US 90-95 per tonne). As a rule, this processing charge is linked with an international price.

127. The quotational period for contracts lasting a year or more is usually the equivalent of the average quotations of the month following arrival at the port of destination. As in any concentrate sales contract, weight and humidity are usually established when the concentrate is unloaded at the port of destination, when the corresponding exchange of assays is made. It is customary to pay 90 per cent of the provisional bill, which is calculated on the basis of the weight and content declared by the seller at the port of shipment, taking as a reference the quotations prevailing at that time.

128. As in the case of other concentrate contracts, a currency clause is usually included covering sharp variations in the base currencies used. In such cases, it is usual to renegotiate those aspects in order to strike a balance between the parties. Finally, force majeure and arbitration clauses are included.

D. Silver

129. Silver sales are only for refined products, as silver is recovered in the processing of concentrates of lead, zinc, etc. The quality (99.99 per cent pure), amount, price and form of delivery are specified. The reference prices in current contracts refer to the quotation published by the Handy and Harman refinery in the case of the United States market or London Bullion in the case of the European market. Methods of sale are the same as for other refined products, although it must be stressed that this a precious metal and thus subject to sharp speculative swings.

E. Tin

130. The main tin exporter is Bolivia. Ores and concentrates are marketed by the Corporación Minera de Bolivia (COMIBOL) and metal by the Empresa Nacional de Fundiciones (ENAF).

131. Contracts for the marketing of tin ores and concentrates usually cover a period of more than one year, with regular deliveries, although exports of concentrates have steadily been declining with the growth of installed foundry capacity.

132. Contracts for ores and concentrates stipulate the tonnage covered by the agreement and the volume to be delivered in instalments established in accordance with the shipping timetable drawn up by the buyer. Recent practice has been to commit products for one or two years, with renegotiations provided for at the end of that period. Contracts specify the quality of the concentrate, indicating the content of tin and other ores (arsenic, antimony, zinc, lead, silver, etc.). The quality of the product depends on those contents which determines the type of plant capable of recovering them.

133. It has been COMIBOL practice to deliver minimum lots of 20 dry net metric tons to the buyer's foundry. Each lot carries the identification of the mine of origin and the ore is bagged, although another type of packaging may be used by agreement

between the parties. COMIBOL reserves the right to supervise the weighing and sampling of each delivery, in order to determine the actual content to be considered in establishing the final settlement.

134. The trading contracts establish that title of ownership of the ores and concentrates is transferred on the date when the purchaser makes a provisional settlement corresponding to 100 per cent of the estimated value of each delivery In accordance with normal international trading practice, the contracts stipulate that the ores and concentrates should be weighed, sampled and assayed at the purchaser's plant in order to determine the humidity content in the presence of a representatiave of COMIBOL. The humidity content 1/ is established by exchanging the certificates obtained by each party independently up to 10 hours following the delivery of the ores and concentrates to the purchaser's plant. Usually, differences of up to 0.15 per cent are split between the two parties. In the case of bigger discrepancies, an arbitral analysis is made by an independent laboratory, whose results are accepted for the purposes of the settlement.

135. In current contracts it is established that a deduction for metallurgical loss of 1.5 per cent per dry net metric ton, on the basis of 50 per cent, is made from the fine tin content. This deduction may be reduced or increased by 0.02 per cent of a unit for each 1 per cent by which the content is above or below 50 per cent. 2/

136. The contracts establish the penalties relating to impurities in the ores. Thus, for example, combined antimony and arsenic are free up to 0.15 per cent, bismuth up to 0.40 per cent, sulphur up to 2 per cent, iron ore between 5 and 9 per cent, etc.; in other words, if the impurity content exceeds these percentages, a penalty is imposed.

137. The tin content of the ores and concentrates, following the above-mentioned deduction, is valued according to the lowest international quotation among the four London Metal Exchange (LME) quotations for standard tin, as published by Reuters, which has a highly specialized commercial and financial service. The quotational period is established by common consent between the parties, and it is general practice to take the period covering the 30 days following the thirtieth day from the delivery of the material to the melting plant.

138. An important aspect, which is the crux of the negotiations, is the fixing of processing costs, in which it is customary to specify a base cost (currently bordering on $US 700 per tonne). This base cost may be increased or reduced every six months by a proportion equal to the percentage increase or decrease in the variables making up the purchaser's cost. Thus, the January cost runs for the first half of the year and the July cost for the second half.

139. It should be pointed out that the trade contracts provide for a penalty for environmental pollution when the buyer carries out investment for environmental protection, usually as a result of Government regulations.

1/ This is important, as the humidity content increases the weight of the product.

2/ This practice stems from the fact that refining plants do not recover the entire mineral content of the lot. A metallurgical loss factor is thus taken into account.

140. Contracts include clauses concerning "performance" costs (sea and land transport, insurance, legal documents, expenses in port of loading, etc.) which are discounted in favour of the buyer from the percentage of payable tin content of the concentrates.

141. The contracts also stipulate currency clauses concerning the exchange rate to be used for converting sterling into United States dollars, covering the previously agreed quotational period.

142. It has been the practice of COMIBOL to charge the buyer a fixed additional amount per tonne for all deliveries in consideration for guaranteed supply.

143. Finally, as in all such commercial contracts, there are force majeure clauses to cover supply problems.

144. The marketing of tin metal is less complicated. ENAF offers "high-grade" (99.85 per cent to 99.95 per cent) and "standard" tin (99.75 to 99.84 per cent). It sells directly and through agents. In the former case, the basis for valuation is the average of quotations for the week following the sale, or the average of the four quotations 10 days before the arrival of the shipment.

145. Sales through agents are governed by so-called agency contracts. These consign to the agent, usually an international trader (Tennant, Marc Rich, etc.), a specified volume per year, with a schedule of deliveries; the contracts may cover two years.

146. Tin metal is valued on the basis of the average of the four LME quotations for the two qualities (high-grade and standard grade). 1/ The valuation is made for five tonnes minimum per day of quotation prior to the seller's approval, so that it acts in the same way as the back-pricing which exists in the case of copper. The quotational period for pricing runs from the date of shipment of the product at the Vinto plant (ENAF) to 10 days after the arrival of the product at the port of destination. ENAF stipulates that price differentials obtained by the agent should be split equally. The agency contract provides for a commission of 0.35 per cent of the net sales price, tax-free.

147. It should be pointed out that agency contracts require the agent to give ENAF a bank guarantee for an amount equivalent to the value of the tonnage according to the schedule of deliveries agreed on with the client. Agents also act as receivers for ENAF, and must make transfers within 48 hours of receiving settlement from the buyer. Payment must be made within 12 days of arrival at the port of destination; otherwise, interest must be paid at the New York prime rate plus 2 per cent.

148. Agency contracts also cover ENAF sales to agents in the form of "principal to principal" sales. In this case, naturally, no commission is charged and the operation is carried out in the manner described above.

149. Finally, it should be mentioned that the agents advise ENAF on hedging operations on the exchanges and in relation to currency cover, and also undertake to train staff.

1/ In other words, the buyers' and sellers' cash prices, and buyers' and sellers' future (three months) prices.

V. ESTABLISHMENT OF JOINT MARKETING VENTURES: PROFILE AND POSSIBILITY OF A MULTINATIONAL ORE MARKETING ENTERPRISE

A. Establishment of a body for mining co-operation in Latin America

150. The establishment of joint ore marketing bodies should be the result of a step-by-step process in which the advantages accruing to each producer from the centralization of exportable supply begin to become clear.

151. As a first stage, it is necessary to institutionalize the relationship between the potential agents for co-operation and draw up joint work programmes with a view to specifying the undertakings which the parties will gradually enter into.

152. In the mining sector, the first-hand agents for co-operation are the State-owned companies, as the State plays a decisive part in the ore production and marketing of member countries. However, there is no entity grouping together all the ore producers. They have sporadic contacts through the activities of some producers' organizations or bodies of the United Nations system.

153. The risks inherent in abruptly proposing the establishment of joint marketing ventures are too great: an initiative of this kind should arise as a need felt by the countries rather than a project suggested to them from outside. In addition, commercial dynamics mean that entrepreneurial leaders are most concerned with short-term problems. Thus, the benefits of horizontal co-operation must be clearly perceived by the potential agents for co-operation in such a way that it is recognized that joint action may be fundamental for increasing individual profits.

154. We therefore consider it necessary to adopt a strategy aimed at setting up as rapidly as possible a body to institutionalize relations among mining enterprises. This might be the Committee for Latin American Mining Co-operation (COMIL), to which the public-sector and private-sector producers of the region could belong, for the purpose of drawing up and implementing co-operation programmes, proceeding from the simplest to the most complex level. 1/

155. Initial forms of co-operation could be very varied, but attention should focus on what the mining producers consider key aspects. These are basically the assimilation of technology, criteria for bargaining with transnational corporations and international traders, access to sources of financing, and terms and conditions in commercial negotiations.

156. It is therefore considered advisable to include not only the main State-owned producers (COMOBOL, ENAF, CENTROMIN, MINERO-PERU, CODELCO) but also commercial entities (INTERBRAS, COBEC, MINPECO) and representatives of the associations of private producers and mining development banks.

1/ Precedents for such bodies existed in the former LAFTA and could be taken as a reference.

157. This co-operation entity could cover the following spheres of action:

A. Drawing up of joint programmes for information, research and promotion in the technological field in order to strengthen engineering in the region.

B. Discussion and harmonization of methods of negotiating with transnational corporations over the exploitation of mining deposits.

C. Strengthening commercial information systems, with a view to:

(a) The joint study of international economic trends, with special emphasis on the ore and financial markets.

(b) The centralization of information on processing costs at the main foundries and refineries, in order to enhance bargaining power on products that involve little processing.

D. Promotion of joint business activities, with a view to:

(a) The harmonization of standard commercial contracts, tending towards the elimination of harmful business practices;

(b) The co-ordination of action aimed at overcoming restrictive and protectionist business practices;

(c) The improvement of commercial bargaining conditions, by setting up machinery to reach the final consumers, in order to do away with intermediaries and diversify markets;

(d) Facilitation of swap operations among Latin American mining enterprises and joint toll contracts with foreign refineries to increase the value added of exports;

(e) The improvement of the bargaining position on freight rates.

E. Drawing up of joint programmes to improve entrepreneurial efficiency, such as executive training programmes.

F. Drawing up of joint financial assistance programmes.

158. The development of this co-operation entity would make it possible to strengthen links among the mining enterprises of the region within a broader sphere, as such links have generally been established to deal with specific problems in producers' organizations and the international study groups (lead and zinc, bismuth, etc.).

B. General guidelines for the establishment of a multinational ore marketing enterprise

(a) Promotion of multinational marketing enterprises for developing countries (MMEs)

159. The promotion of MMEs, and particularly of a multinational ore marketing enterprise (EMCOM), falls within the programmes for co-operation among developing countries which have been developed since UNCTAD IV. A detailed review of the

areas in which the formation of multinational enterprises should be promoted may be found in the document prepared by the Division for Economic Co-operation among Developing Countries on this question in September 1978. 1/ It is suggested in that document that three possibilities may be considered in the mining field: (a) to set up enterprises specializing in the marketing of individual products; (b) to set up enterprises for a product package; and (c) to set up a single enterprise to export a wide range of mining products, like any other international trader. The document comes out in favour of the last option, likewise considered most appropriate by the present document. This choice is justified not only because that is how the trading companies already existing in the ore market operate, but also because the infrastructure which would have to be set up for one or more products could also serve for a wider range of products. Nevertheless, as has been seen, this document focuses on the range of non-ferrous metals.

(b) Formation of the multinational ore marketing enterprise

160. The central objectives of the EMCOM are to establish a channel for access to the world market in order to be able to operate on a large scale and with a diversified product range and thus strengthen the bargaining power of the mining producers and reap the surplus profits stemming from international trade. The EMCOM would be set up with the participation of two or more developing-country investors. Here interregional participation is considered important, in order to form a concentrated volume of operations of great economic significance. It is also considered advisable to set up its headquarters at an important place in the world ore market, preferably London, and that it should be formed in accordance with the prevailing provisions on trading companies.

(c) Characteristics of the multinational ore marketing enterprise

161. The EMCOM should not receive preferential treatment but must operate in competition with the marketing channels in existence in the participating countries. Thus, the EMCOM would not be exclusive and would aim at concentrating bargaining power in order to avoid the atomization of exportable supply and unnecessary competition among the countries concerned.

162. There are three possible profile outlines for the EMCOM.

(1) The EMCOM planned as an instrument for limited participation in the market

163. In this case, the target function would be to regulate or stabilize market prices, by co-ordinating the action of producer countries. 2/ In this form, it would act as a co-ordinating body for two or more mining enterprises. The aim would be to gain experience in carrying out joint operations in order to dampen

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1/ Fernando Sanchez Albavera and Belisario Esteves, Areas of Potential Interest for Promoting the Establishment of Multinational Marketing Enterprises, Project RLA/73/063, Geneva, 1978.

2/ Machinery of this kind, although not strictly in the form of an enterprise, has recently been under discussion in CIPEC.

the negative fluctuations in the market for one or more mining products. It would basically act in the metals exchanges. In fact, the aim would be to design machinery for inter-enterprise co-ordination, which would act as a limited company, with the ability to operate on the physical or futures market, in either the LME or New York rings or both at once.

(2) The EMCOM planned as an essentially intermediate entity

164. In this case, the EMCOM would operate as a typical trading company. Its objective would be merely to generate deals, in which the decisive factor would be the profit margin between a buying operation and a selling operation. It should be noted that in this case the price factor becomes irrelevant; what is important is the size of the marketing margin.

(3) The EMCOM planned as an entity for maximizing foreign currency earnings

165. In this case the price level is of fundamental importance, as the EMCOM would operate as a commission house basically carrying out "back to-back" operations.

166. There are not sufficient grounds for choosing one or another of these options, with the exception of financial considerations. The EMCOM could perfectly well perform all three functions. At a given point in time, it could concentrate the commercial activity of the partners in order to influence price trends by buying or selling. It could generate business by taking advantage of its information and benefiting from the difference between the buying and the selling price, covering itself on the futures market. Finally, it could operate with a specific supply, acting as a sales agent for a group of producers and earning income from commissions.

167. However, it would be important to ensure that it operated with a flexible exportable supply which would not necessarily be restricted to whatever allocations it received from its future partners.

(d) Possible partners and volume of transactions

168. The partners of the EMCOM could be the State-owned enterprises operating in the mining sector of the various countries of the region, as well as private investors, whether or not directly linked to the mining sector.

169. The possible volume of transactions of the EMCOM is hard to specify as it would depend on the degree to which the partners were interested in strengthening it as a marketing channel. In addition, this volume could be determined only once the membership of the EMCOM, and the capital input they would be prepared to make, had been established. On the basis of that information a feasibility study could be carried out, and the possible profitability of the EMCOM calculated. However, to give an idea of the capital required, a medium-sized trader could be taken as a model, as it would be an enterprise which would steadily expand activities as it proved its efficiency. In the opinion of trading experts linked with the mining industrial associations, a firm with the following scale of operations could be considered a medium-sized trader:

Products	Volume (tonnes)
Copper concentrates	20 000
Blister copper	30 000

Refined copper	25 000
Lead concentrate	35 000
Refined lead	25 000
Refined silver	70
Zinc concentrate	50 000
Refined zinc	25 000

170. This volume of transactions corresponds roughly to an average of between 2 per cent and 5 per cent of the potential exportable supply with which the Multinational Ore Marketing Enterprise would have to operate in accordance with the figures given in the statistical appendix. However, the annual value of such operations at 1981 prices, which were very low, would be in the order of $130 million. In keeping with what is normal in the trading of mining products, the enterprise's working capital should be between $25 million and $38 million, the equivalent of between 60 and 90 days of operation with the volumes indicated above. The order of magnitude of this calculation, which is purely a reference, suggests that this could be an initial target for the EMCOM.

(e) Methods of operation

171. The EMCOM would basically carry out two types of commercial transaction: direct buying and selling or "firm" operations and back-to-back operations. In the first case, the EMCOM would earn profits from the difference between the buying price and the selling price. In the second case, it might have an agency contract with mining producers, who would allocate to it all or some of their production, or it could propose substitutes for orders held by producers when it found potential buyers offering better terms.

172. During the initial stage, it seems important that the EMCOM should carry out back-to-back operations, and indeed should not hold exclusive agency contracts. The reason for this is that direct buying and selling requires considerable working capital and involves considerable risk if the company is not in a position to carry out hedging operations. In addition, back-to-back operations would make it possible to acquire experience in marketing and test the efficiency of its sales activities, as the producer would be able to compare the sale terms and conditions offered by the EMCOM with those on their books.

(f) Aspects to be considered in respect of the organization of the EMCOM

173. One of the most important aspects of the organization of the EMCOM is that of flexible supply. In other words, the EMCOM should not confine its operations to a specific volume of supply allocated to it. This has precisely been one of the problems faced in national marketing experiments, which has hindered their direct access to some consumers. Many enterprises prefer to obtain supplies from the international traders because the latter guarantee stable supplies.

174. It is therefore very important that the EMCOM should have sufficient financial independence to be able progressively to conclude contracts for regular deliveries.

175. It is likely, however, that initially it will engage in short-term operations, in the form of spot sales, in order to sell the producers' surpluses, as most of them have committed much of their production to long-term arrangements.

176. The EMCOM must also be organized on the basis of two types of specialization. The first concerns the degree of processing of the products marketed. As explained above, marketing ores and concentrates is not the same as marketing refined products. It is therefore advisable to establish two divisions, one for ores and concentrates and the other for refined products.

177. The second criterion for specialization is by product type. In each of the above two divisions specialized sections should be established for copper, lead, zinc, tin and so forth. The aim should be to set up sales teams by products, with specialization according to the degree of processing.

178. A very important aspect is that of geographical location. The EMCOM should have agencies in the main sales centres: London, to deal with Western Europe; Beijing, to deal exclusively with the Chinese market on account of its size; Tokyo, for the Asian market; an Eastern European capital, for the market of the socialist countries; New York, for North and Central America; and São Paulo, for South America.

179. It might be desirable to have sales representatives in some countries in order to have better consumer contacts and information.

180. The EMCOM trading network must therefore be based on two criteria of geographical specialization; one relating to contacts with major consumers and the other to contacts with principal producers. Persons working in contact with producers should receive instructions from the agencies, which should be located in the main sales centres, concerning the volume and price levels for supply offers. The function of these agencies is to generate business and consequently maximize profits, while the producers' liaison offices have to secure exportable supplies. Contacts between the two operating units must be very fluid. The agencies are also centres for storing trading information distributed daily to the producers' liaison offices so that they can operate in line with market trends.

181. In sum, the most important functional criterion is that of flexible supply. In other words, the EMCOM should be viewed as generating new trade opportunities which are more profitable options than those available to individual producers through existing marketing channels. In addition to this functional criterion, there is the criterion of specialization by degree of processing, type of product, point of sale and source of supply.

(g) Nature of the financial flows

182. The financial management of an enterprise such as the EMCOM must harmonize and regulate the flows of receipts and of outgoings with a view to minimizing financial costs. Financial management is crucial in any international marketing enterprise as constant liquidity is required in order to obtain the volumes of production necessary for trading opportunities.

183. Income flows stem from direct sales, commissions, interest and so forth, while outgoing flows consist of settlements to producers, operating costs and financial costs. Obviously we are simplifying the concepts in order to single out the main items involved in trading operations.

184. An important and integral aspect of the design of the EMCOM is how to spread costs and profits between the enterprise and producers.

185. Income flows will obviously depend on the total value of commercial operations, but are influenced by sales conditions. In the ore trade, terms and conditions have a number of aspects which affect the financial management of a marketing company. For example, in the case of refined products it is normal to settle in full for the volume contracted for, whereas in the case of ores and concentrates a provisional settlement of at least 80 per cent in most cases is customary. In the latter case, the advances are certainly influenced by market conditions and by the bargaining power of the parties. Sometimes facilities are granted to the purchaser in exchange for an advance equal to or close to the final settlement. Obviously, the advances may lead to a financial cost to the buyer if there are considerable differences between the provisional settlement and the final settlement, which will depend on the time gap between the two.

186. Another aspect affecting the income flow is the form of payment. Settlements are usually made against delivery of certificates of deposit, delivery of shipping documents or letter of credit, which is usually used with unfamiliar clients.

187. The most widely used method in the ore trade is settlement against shipping documents, which depends on the time interval between departure and arrival at the port of destination. Here it would be desirable to establish specific practices that take into consideration the distance between the point of sale and the port of destination.

188. Collection management is especially important in the case of concentrates, as the final settlement depends not only on the interval between the sale and receipt of the product but also on the exchange of quality standards carried out at the port of destination. When arbitration is required, for example, this leads to a delay in the final settlement which affects the collection schedule.

189. In the case of direct buying and selling, the marketing enterprise operates at risk, depending for its income on the marketing margin it can obtain. It should be pointed out here that the EMCOM should not speculate with its supply, as this would raise financial costs and create a risk situation which could affect its financial stability. In back-to-back operations the EMCOM should make an advance payment to the producer within a fixed period, as to pay the producer on the basis of the collection period could seriously affect its liquidity. These advances would have a financial cost, and a surcharge should therefore be imposed for the service. In this case collection management is essential, as it may happen that the surcharge imposed on an international reference interest rate might be lower than the cost stemming from the collection period, which would increase the EMCOM's financial costs.

190. Consequently, the EMCOM needs ample financial liquidity to operate properly. It is customary for traders to grant advances for the product delivered to their warehouses, which involves a financial cost. In addition, traders sometimes grant working capital loans in order to secure future supply.

191. In the case of back-to-back operations, it is most likely that producers will require the EMCOM to make a final settlement within a fixed period, whereas direct buying or selling is carried out on a cash basis, with a financial cost for the EMCOM between the two operations.

192. The EMCOM will certainly have to become indebted to the banking system in order to ensure timely payments, the guarantee being provided by the products involved in the transaction.

193. To summarize, efficient financial management is fundamental in the marketing of mining products.

C. CONCLUSIONS

194. The formulas for co-operation in the mining sector should be worked out through successive stages. In the first instance it is necessary to institutionalize co-operation through an entity which we have called the Latin American Mining Co-operation Committee, grouping public-sector and private-sector producers, national traders and mining development banks.

195. The EMCOM should be planned as a trading company whose efficiency is measured in terms of the results of its economic activities.

196. Thus, relations with producers may vary, ranging from direct buying and selling to acting as an agency in the strict sense. In any event, it is important that the EMCOM should be provided with enough working capital, as investment in fixed assets would not be very large.

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PROFILE AND PROSPECTS OF A MULTINATIONAL MINERAL MARKETING CORPORATION: LATIN AMERICA

Prepared by Fernando Sánchez Albavera at the request of the UNCTAD secretariat

Statistical appendix

UNCTAD/ECDC/139/Add.1
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Table

TABLE 1

WORLD DISTRIBUTION OF PROVED AND PROBABLE RESERVES OF MAJOR MINERALS
(Percentages for 1976-1978)

	Developed market economies	Centrally planned economies	Developing economies	Total	Latin America
Bauxite	27	3	70	100	36
Copper	35	10	55	100	37
Tin	8	19	73	100	16
Iron	32	24	44	100	24
Molybdenum	63	18	19	100	18
Nickel	40	5	55	100	13
Lead	68	9	23	100	9
Tungsten	31	49	20	100	9
Zinc	50	27	23	100	9

Source: "Evolution of, and prospects for, the mining sector in Latin America" (E/CEPAL/R.265).

TABLE 2

LATIN AMERICA: COMPOSITION AND EVOLUTION OF MINERAL PRODUCTION
(percentage of value of total mineral production) a/

	1950	1977	Growth rate 1950-1977
Copper	47.1	53.5	4.3
Iron	1.7	11.1	11.3
Zinc	6.8	6.7	3.7
Bauxite	2.9	6.3	6.8
Nickel	-	5.2	10.1
Tin	8.3	3.6	0.6
Lead	7.5	3.5	0.8
Silver	10.4	5.3	1.2
Sub-total	84.7	95.2	-
Other	15.3	4.8	-
TOTAL:	100.0	100.0	3.8

Source: As for table 1.

a/ At 1970 prices.

TABLE 3

SHARE OF LATIN AMERICA IN WORLD MINERAL PRODUCTION BY DEGREE OF PROCESSING

(percentage of total volume for 1976-1977)

	Ores and concentrates	Smelted and refined products
Copper	18	13
Iron	15	3 a/
Zinc	15	5
Bauxite	26	2 b/
Nickel	9	-
Tin	21	11
Lead	14	10

Source: As for table 1.

a/ Steel

b/ Aluminium metal

TABLE 4

LATIN AMERICA: MINERAL SUPPLY AND DEMAND

(Percentage distribution, 1976-1978)

	Supply	Apparent consumption	Imports	Exports
Bauxite a/	100	6	1	95
Copper	100	26	16	90
Tin	100	27	63	136
Iron	100	29	2	73
Nickel	100	17	13	96
Lead	100	43	9	66
Zinc	100	24	16	92

Source: As for table 1.

a/ Alumina content.

TABLE 5

PERCENTAGE DISTRIBUTION OF INTERNATIONAL TRADE IN MINERALS AND METALS (1976)

Imports \ Exports	Latin America	Other developing economies	Developed market economies	Centrally planned economies	Share in world exports
Latin America	12	1	80	7	7
Other developing economies	1	24	71	4	10
Developed market economies	4	16	69	11	73
Centrally planned economies	2	6	29	63	10
Share in world exports	4	14	67	15	100

Source: As for table 1.

TABLE 6

INDEX OF PRICES OF SELECTED METALS a/

(1950 = 100)

Period	Bauxite		Copper		Tin		Lead		Zinc	
	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real
1966-1970	180	132	274	201	166	122	90	66	85	63
1971-1975	220	100	293	133	264	119	136	62	215	97
1976	286	93	286	93	373	122	154	50	217	71
1977	364	108	266	79	524	156	211	63	180	54
1978	306	80	276	72	626	164	225	59	180	47
1979	-	-	403	93	752	174	411	95	227	52

Source: As for table 1.

a/ London Metal Exchange prices.

TABLE 7

PROJECTION OF WORLD MINING INVESTMENT IN THE 1980s

	million $	Share (%)
Developed countries	27 711.6	39.8
United States	4 475.5	7.2
Canada	5 203.5	8.4
Western Europe	2 614.5	4.3
Developing countries	37 412.6	60.2
Latin America	22 422.0	36.1

Source: As for table 1.

TABLE 8

MAJOR INVESTMENT PROJECTS IN LATIN AMERICA IN THE 1980s

	million $	Share (%)
Aluminium	5 040	22.5
Copper	11 548	51.5
Tin	68	0.3
Iron	2 620	11.7
Silver	160	0.7
Lead	206	0.9
Nickel	560	2.5
Zinc	830	3.7
Other	1 390	6.2
TOTAL	22 422	100.0

Source: As for table 1.

TABLE 9

LATIN AMERICA: SHARE OF MINERAL PRODUCTION IN GDP
(%)

	1960	1979
Bolivia	6.4	5.5
Chile	11.1	12.2
Guyana	-	13.0
Jamaica	-	8.7
Mexico	4.2	5.1
Peru	7.9	8.7
Dominican Republic	1.9	5.9
Venezuela	27.5	8.0
Latin America	4.3	4.3

Source: As for table 1.

TABLE 10

LATIN AMERICA: AVERAGE SHARE OF MINERAL EXPORTS IN NATIONAL EXPORTS

	%
Bolivia	58.0
Chile	64.8
Guyana	44.4
Jamaica	50.0
Mexico	5.0
Peru	39.0
Dominican Republic	18.6
Venezuela	3.4

Source: ECLA figures.

TABLE 11

LATIN AMERICA: PERCENTAGE DISTRIBUTION OF VOLUME, OF PRODUCTION AND RESERVES OF MAJOR MINERALS

	ARGENTINA	BOLIVIA	CHILE	PERU	VENEZUELA	BRAZIL	MEXICO	PANAMA	TOTAL
COPPER									
Production	-	-	71	23	-	-	3	-	97
Reserves	3	-	56	17	-	-	13	7	96
TIN									
Production	2	79	-	1	-	18	-	-	100
Reserves	-	62	-	-	-	36	-	-	98
IRON									
Production	-	-	7	3	10	77	3	-	100
Reserves	-	48	-	2	2	30	1	-	83
SILVER									
Production	1	5	6	45	-	-	42	-	99
Reserves	-	-	-	39	-	-	61	-	100
LEAD									
Production	8	5	-	39	-	10	35	-	97
Reserves	-	-	-	35	-	21	43	-	99
ZINC									
Production	4	6	-	57	-	5	24	-	96
Reserves	-	-	-	41	-	29	26	-	96

Source: As for table 1.

TABLE 12

LATIN AMERICA: PERCENTAGE DISTRIBUTION OF VALUE OF EXPORTS OF SELECTED MINERALS BY MAJOR EXPORTING COUNTRIES

		% of 1977	OVER-ALL PERCENTAGE
Iron	Brazil	63.7	
	Venezuela	17.3	
	Chile	5.9	
	Peru	3.0	89.9
Copper	Chile	76.0	
	Peru	22.0	
	Mexico	1.5	99.5
Bauxite	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

Source: As for table 1.

TABLE 13

LATIN AMERICA: FORECAST OF INVESTMENT IN MINING PROJECTS IN THE 1980s
(million $ and %)

	VALUE	SHARE
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	22 422	100.0

Source: As for table 1.

TABLE 14

BOLIVIA: DISTRIBUTION OF TIN PRODUCTION

(thousand metric tons and %)

	COMIBOL		MEDIUM-SCALE MINING		SMALL-SCALE MINING	
	MT	%	MT	%	MT	%
1970	18.8	64	6.6	22	3.8	13
1975	20.3	64	6.7	21	4.5	14
1977	23.3	69	7.0	21	2.6	7
1980	19.0	69	5.9	21	2.7	10

Source: Relationship of transnational corporations with the tin industry in Bolivia (E/ECLA/SEM.3/L.6).

TABLE 15

COMIBOL: SALES OF TIN ORE
(metric tons and % of total)

Smelters	1970		1979	
	Metric tons	%	Metric Tons	%
Williams Harvey	8 052	42.9	---	---
Gulf Chemical	5 062	27.0	1 103	6.0
Capper Pass	2 820	15.0	3 682	19.9
Metallgeseschaft	508	2.0	649	3.5
Other foreign smelters	999	5.3	1 004 a/	5.4
Sub-total	17 441	92.2	6 438	34.8
ENAF (State smelter) b/	1 314	7.8	12 013	65.1
TOTAL	18 755	100.0	18 451	100.0

Source: As for table 14.

a/ Including 994 metric tons sold to the trader Marc Rich.

b/ Operates the VINTO smelter.

TABLE 16

ENAF: DISTRIBUTION OF SALES OF TIN METAL

(%)

MARKET	SALES
Western Europe and United States	61
(a) Direct sales	18-20
(b) Sales through agents	40
Latin America	10
(a) Direct sales	8
(b) Sales through agents	2
Socialist countries	27
(a) Direct sales	27
Other markets	2
TOTAL	100

Source: Estimates based on the same source as table 14 and on information provided by ENAF.

TABLE 17

BOLIVIA: EXPORTS OF MINERAL PRODUCTS BY COMIBOL AND BAMIN (metric tons, million $ and %) a/

	VOLUME				VALUE			
	1979	%	1980	%	1979	%	1980	%
A. COMIBOL								
Tin concentrates	6 438	57	4 991	60	95.6	57	83.7	60
Copper concentrates	1 681	97	1 673	99	3.2	97	3.5	99
Lead concentrates	10 068	64	8 896	56	11.5	64	8.1	56
Zinc concentrates	29 528	55	25 277	55	23.4	55	20.0	55
Silver (complex)	152	83	143	81	48.8	84	97.1	82
Other	--	--	--	--	14.1	--	22.4	--
SUB-TOTAL	--	--	--	--	196.6	33	234.8	37
B. BAMIN								
Tin concentrates	2 944	26	2 235	27	43.4	26	38.3	27
Lead concentrates	2 462	16	3 365	21	2.7	15	3.0	21
Zinc concentrates	4 537	8	1 223	3	3.6	8	0.9	2
Silver (complex)	14	8	20	11	4.3	7	12.8	11
Antimony (concentrates)	1 831	14	1 665	22	2.8	13	3.2	22
Other	--	--	--	--	4.7	--	6.3	--
SUB-TOTAL	--	--	--	--	61.5	10	64.5	10
C. VALUE A + B	--	--	--	--	258.1	43	299.3	47

Source: Prepared from figures provided by the Bolivian Ministry of Mining and Metallurgy.

a/ % of total national exports.

TABLE 18

BOLIVIA: EVOLUTION OF NATIONAL PRODUCTION OF MINERAL CONCENTRATES
(metric tons)

CONCENTRATES	1976	1977	1978	1979	1980	1981
Tin	30 315	33 740	30 885	27 648	27 271	29 800
Silver	169	181	195	179	190	205
Lead	19 200	18 397	18 039	15 359	17 225	19 756
Copper	5 101	3 191	2 853	1 797	1 884	2 637
Bismuth	612	651	307	10	10	10
Antimony	17 015	16 340	13 336	13 019	15 465	15 296
Wolfram	3 132	3 063	3 073	3 114	3 359	3 448
Zinc	53 014	63 508	59 619	44 141	50 260	47 028

Source: Bolivian Ministry of Mining and Metallurgy.

TABLE 19

BOLIVIA: EVOLUTION OF NATIONAL METAL PRODUCTION
(thousand metric tons)

	Year					
	1976	1977	1978	1979	1980	1981
Tin metal	9 790	12 936	16 184	14 950	17 106	18 730
Alloys	310	346	76	746	542	1 206
Powder	675	964	29	-	111	69
Antimony	1 876	2 345	1 913	2 561	4 249	4 487
Trioxides	756	1 302	1 017	880	704	628
Alloys	50	-	1 262	-	0.2	721
Bismuth metal	398	586	292	64	41	-

Source: Bolivian Ministry of Mining and Metallurgy.

TABLE 20

BOLIVIA: EVOLUTION OF MINERAL AND METALLURGICAL EXPORTS BY VOLUME
(metric tons)

	Year					
	1976	1977	1978	1979	1980	1981
Tin concentrates	20 487	18 413	13 817	11 304	8 312	5 524
Tin metal	9 867	12 679	17 562	16 041	15 041	15 215
Wolfram	3 278	2 800	2 851	2 646	3 435	3 097
Antimony concentrates	15 662	12 390	8 136	13 266	7 386	11 173
Antimony metal	1 744	1 431	3 516	3 370	5 237	6 586
Zinc	49 206	61 356	51 621	53 923	46 236	44 680
Lead	18 581	19 878	16 482	15 633	15 936	15 612
Silver	176	209	197	181	176	203
Copper	4 680	3 173	2 989	1 739	1 675	2 544

Source: Bolivian Ministry of Mining and Metallurgy.

TABLE 21

BOLIVIA: EVOLUTION OF MINERAL EXPORTS BY VALUE

(thousand $US)

Mineral	Year					
	1976	1977	1978	1979	1980	1981
Tin concentrates	153 845	192 864	172 702	167 563	139 349	77 199
Tin metal	74 251	135 950	200 977	228 004	238 798	254 459
Wolfram	34 844	45 130	39 471	35 147	47 369	42 954
Antimony concentrates	27 203	14 754	10 641	21 770	14 599	20 177
Antimony metal	4 189	3 299	5 976	7 806	11 833	14 128
Zinc	39 138	44 745	31 362	42 686	36 679	40 422
Lead	8 436	12 398	10 683	17 991	14 450	11 459
Silver	24 323	30 808	33 764	58 267	118 328	71 693
Copper	6 520	4 099	3 968	3 296	3 535	4 402
Bismuth	3 697	5 168	636	287	2 670	89

Source: Bolivian Ministry of Mining and Metallurgy.

TABLE 22

BRAZIL: EVOLUTION OF THE COPPER MARKET

(thousand metric tons)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
PRODUCTION: TOTAL	33 4	36 3	40 5	46 7	53 5	33 3	39 3	45 9	45 0	53 1	63 0
PRIMARY	4 6	5 1	4 8	4 2	2 5	1 3	-	-	-	-	-
SECONDARY[a]	28 8	31 2	35 7	42 5	51 0	32 0	39 3	45 9	45 0	53 1	63 1
IMPORTS TOTAL	54 5	72 4	86 3	97 1	139 4	130 4	152 8	185 9	160 2	194 5	214 1
SCRAP	0 1	0 3	-	1 0	4 6	0 2	0 3	0 7	1 3[b]	2 3[b]	3 4
EXPORTS	1 0	0 8	2 2	1 9	1 3	0 9	0 5	1 8	5 3	6 9	4 4
APPARENT CONSUMPTION[c]	86 8	107 6	124 6	140 9	187 5	162 6	191 3	229 3	199.0	239 3	269 3

Source: CONSIDER

a/ Including metal obtained from imported scrap.

b/ Scrap for secondary production: 1978 = 900 metric tons; 1979 = 1.4 metric tons.

c/ Primary production + secondary production + total imports - imports of scrap for secondary production - exports.

TABLE 23

BRAZIL: FORECAST OF SUPPLY AND DEMAND FOR COPPER METAL

(Thousand metric tons)

	1981 p/	1982	1983	1984	1985	1986	1987	1988	1989	1990
DOMESTIC DEMAND	188	233	260	290	320	350	385	425	475	525
PRODUCTION	45	100	210	220	230	235	305	405	420	430
Primary	-	45	150	150	150	150	210	300	300	300
Carafba	-	45	150	150	150	150	150	150	150	150
Eluma	-	-	-	-	-	-	60	150	150	150
Secondary	45	55	60	70	80	85	95	105	120	130
EXPORTS	12	24	-	-	-	-	-	-	-	-
DIFFERENCE (DOMESTIC DEMAND - IMPORTS)	156	157	50	70	90	115	80	20	55	85

Sources: CONSIDER and own estimates.

p/ Preliminary.

TABLE 24

BRAZIL: FORECAST OF SUPPLY AND DEMAND FOR COPPER CONCENTRATES

(Thousand metric tons metal content)

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
DEMAND (for primary production of copper)	-	45	150	150	150	150	210	300	300	300
PRODUCTION	20	47	72	72	117	117	117	267	267	267
Caraíba	20	35	60	60	60	60	60	60	60	60
Camaquã	-	12	12	12	12	12	12	12	12	12
Surubim	-	-	-	-	6	6	6	6	6	6
Pedra Verde	-	-	-	-	4	4	4	4	4	4
Mara Rosa	-	-	-	-	35	35	35	35	35	35
Carajás	-	-	-	-	-	-	-	150	150	150
DIFFERENCE (PRODUCTION - DEMAND)	20	2	-78	-78	-33	-33	-93	-33	-33	-33

Source: DNPM, Caraíba Metais and own estimates based on information updated to January 1982.

TABLE 25

BRAZIL: EVOLUTION OF THE LEAD MARKET

(Thousand metric tons)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
TOTAL PRODUCTION	35.5	45.7	47.0	58.5	62.8	62.7	69.2	77.3	80.4	98.1	84.9	65.8
Primary	19.5	25.7	25.0	34.5	41.7	37.5	43.7	48.3	47.2	55.1	44.5	34.7
Secondary a/	16.0	20.0	22.0	24.0	21.1	25.2	25.5	29.0	33.3	43.0	40.4	31.1
IMPORTS												
Total	1.4	8.3	8.5	22.7	27.3	16.7	9.2	14.9	0.8	2.7	1.4	2.0
	-	0.6	0.4	2.4	6.9	3.4	-	-	-	2.1	1.4	1.8
EXPORTS	-	-	-	-	-	-	-	-	-	0.2	2.2	0.1
APPARENT CONSUMPTION b/	36.9	53.4	55.1	78.8	83.2	76.0	78.4	92.2	81.2	98.5	84.1	65.6

Source: CONSIDER.

a/ Including metal obtained from imported scrap.

b/ Primary production + secondary production + total imports - imports of scrap for secondary production - exports.

TABLE 26

BRAZIL: FORECAST OF SUPPLY AND DEMAND FOR LEAD METAL

(Thousand metric tons)

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
DOMESTIC DEMAND	66	70	78	86	93	100	108	117	126	136
PRODUCTION										
Primary	35	30	38	41	41	41	41	41	41	41
COBRAC	20	15	20	23	23	23	23	23	23	23
PLUMBUM	15	15	18	18	18	18	18	18	18	18
Secondary	31	37	42	48	55	60	64	75	75	75
TOTAL	66	67	80	89	96	101	105	116	116	116
DIFFERENCE (PRODUCTION - DOMESTIC DEMAND)	-	-3a/	2	3	3	1	-3	1	-10	-20

Source: CONSIDER, ICZ and own estimates.

a/ To be covered from accumulated inventories.

TABLE 27

BRAZIL: FORECAST OF SUPPLY AND DEMAND FOR ZINC METAL

(Thousand metric tonnes)

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
DOMESTIC DEMAND	127	134	150	165	180	197	214	233	254	276
PRODUCTION	111	120	125	142	175	197	199	201	203	206
Primary	92	105	107	122	152	172	172	172	172	172
CMM	55	65	65	65	65	80	100	100	100	100
Ingá	9	10	12	12	12	12	12	12	12	12
Paraibuna	28	30	30	45	60	60	60	60	60	60
Secondary	19	15	18	20	23	25	27	29	31	34
DIFFERENCE (PRODUCTION - DOMESTIC DEMAND)	-16[a/]	-14	-25	-23	-5	-	-15	-31	-51	-70

Source: CONSIDER, ICZ and own estimates.

a/ The contraction of the domestic market in 1981 was reflected in exports of approximately 12,000 metric tonnes.

TABLE 28

BRAZIL: EVOLUTION OF THE ZINC MARKET

(Thousand metric tonnes)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
TOTAL PRODUCTION	12.5	16.2	19.9	27.3	35.5	39.4	52.8	55.8	68.3	78.8	96.0
Primary	9.1	12.5	16.2	22.3	30.5	31.4	43.2	47.6	56.1	63.5	78.3
Secondary	3.4	3.7	3.7	5.0	5.0	8.0	9.6	8.5	12.2	15.3	17.7
TOTAL IMPORTS	44.0	50.7	54.3	77.9	63.8	50.7	54.2	58.6	67.5	60.2	59.7
EXPORTS	-	-	1.7	-	-	0.1	0.1	0.1	0.1	0.2	0.3
APPARENT CONSUMPTION a/	56.6	66.9	73.5	105.2	99.3	90.0	106.9	114.0	135.7	138.8	155.4

Source: CONSIDER

a/ Primary production + secondary production + total imports - exports

TABLE 29

BRAZIL: EVOLUTION OF THE TIN MARKET

(Thousand metric tonnes)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
PRIMARY PRODUCTION	3.6	2.2	2.5	3.8	6.2	6.6	6.4	7.4	9.3	10.1	8.8	7.6
EXPORTS	1.1	1.1	1.4	1.2	2.7	3.5	1.8	2.6	4.3	4.7	3.8	4.9
APPARENT CONSUMPTION a/	2.5	1.1	1.1	2.6	3.5	3.1	4.6	4.8	5.0	5.4	5.0	2.7

Source: CONSIDER

a/ Primary production - exports.

TABLE 30

BRAZIL: EXPORTS OF UNWROUGHT TIN BY ENTERPRISES
(thousand dollars)

	1980	%	1981[a/]	%
Private enterprises				
Mamore Mineracao Metal	8 613	19	-	-
Cía. Estanífera Brasil	10 636	23	6 569	56
Cía. Ind. Fluminense	736	1	49	-
Mineracao Taboca	1 312	3	-	-
Soc. Bras. Metais Ltda.	1 864	4	496	4
Rhodia Exp. Imp. S.A.	7 110	16	1 106	10
Monsa Com. Ind. Ltda.	969	2	1 649	14
Best. Metais Soldas	1 248	3	-	-
Mequimbras Metal	177	-	-	-
Metal EMESA	163	-	-	-
Sub-Total	32 828	71	9 869	84
State enterprises				
COBEC	6 716	15	-	-
INTERBRAS	6 403	14	1 932	16
Sub-Total	13 119	29	1 932	16
NATIONAL TOTAL	45 947	100	11 801	100

Source: CACEX, Banco do Brazil

a/ January-June.

TABLE 31

BRAZIL: DESTINATION OF EXPORTS OF UNWROUGHT TIN
(percentages)

Enterprise/market	1980
A. STATE ENTERPRISES	
COBEC	100.0
United States	73.0
Switzerland	27.0
Interbras	100.0
Argentina	10.0
United States	86.0
Netherlands	4.0
B. PRIVATE ENTERPRISES	100.0
Argentina	15.0
Chile	0.5
Uruguay	1.1
Colombia	0.7
Venezuela	4.0
Sub-total, Latin America	21.3
United States	75.3
Western Europe	2.7
Africa	0.7

Source: CACEX figures, Banco do Brazil

TABLE 32

VALUE OF INTERNATIONAL OPERATIONS OF THE COMPANIA ESTANIFERA DEL BRASIL IN 1980

(thousand dollars)

Exports	Value	National exports
Unwrought tin	10 636	23%
Tin bars and sections	683	100%
Tubes and other bars	10 788	66%

Source: CACEX figures Banco do Brazil.

TABLE 33

CHILE: STRUCTURE OF COPPER PRODUCTION

(thousand metric tonnes and %)

Year	Refined	%	Blister	%	Concentrates and ore	%	Total
1975	535.2	65	189.2	23	103.9	12	828.3
1976	632.0	63	224.3	22	148.9	15	1 005.2
1977	676.0	64	212.4	20	167.8	16	1 056.2
1978	749.1	72	178.3	17	108.1	11	1 035.5
1979	781.8	73	167.8	16	113.4	11	1 061.0
1980	810.7	76	142.4	13	114.6	11	1 067.7
1981	775.6	72	178.3	16	126.9	12	1 080.8

Source: Chilean Copper Commission: Copper statistics, April 1982.

TABLE 34

CHILE: EXPORTABLE SUPPLY OF REFINED COPPER

(thousand metric tonnes and %)

Year	Production (1)	Consumption (2)	Exports (3)	Ratio 2/1 %
1975	535.2	26.8	508.4	5
1976	632.0	46.3	585.7	7
1977	676.0	48.4	627.6	7
1978	749.1	51.6	697.5	7
1979	779.5	49.1	730.4	6
1980	795.8	42.9	752.9	5

Source: Figures from the Chilean Copper Commission Memoria Anual, 1980.

TABLE 35

CHILE: DISTRIBUTION OF COPPER PRODUCTION

(%)

Year	State enterprises	Foreign enterprises	National enterprises
1977	92	3	5
1978	92	3	5
1979	94	2	4
1980	94	3	3
1981	92	4	4

Source: Figures from the Chilean Copper Commission.

TABLE 36

CHILE: VALUE OF EXPORTS OF COPPER AND RELATED PRODUCTS

(million $)

	Copper	Molibdenum concentrates	Other related products	Total
1977	1 169.2	57.6	23.3	1 250.1
1978	1 224.4	83.2	36.4	1 334.0
1979	1 900.5	210.9	68.2	2 179.6
1980	2 152.5	129.2	140.8	2 422.6
1981	1 713.5	126.3	98.4	1 938.2

Source: Chilean Copper Commission.

TABLE 37

CHILE: MAJOR COPPER INVESTMENT PROJECTS

(thousand $)

Deposit	Investor	Investment in 1979	Investment in 1980	Over-all total
Quebrada Blanca	Falconbridge	5 293	6 224	16 351
Disputada	Exxon	65 500	70 510	331 000
Pelambres	Anaconda	21 540	12 416	33 956
El Indio	St. Joe	24 066	125 317	160 000
Total		116 399	214 467	541 307

Source: Chilean Copper Commission.

TABLE 38

PERU: COPPER MINING INDICATORS

(1) Evolution of production (thousand metric tonnes)

1950	1960	1970	1979
30	182	220	397

(2) Distribution of production (% volume of production)

Scale of production	1970	1979
Large-scale mining	74.0	89.4
Medium-scale mining	23.0	10.1
Small-scale mining	3.0	0.5

(3) Distribution by type of ownership (% volume of production)

Type of enterprise	1968	1978
Public	--	15
Foreign	87	78
National private enterprise	13	7

(4) Structure of copper production (% volume of production)

Products	1960	1970	1979
Refined	16	16	51
Blister	74	64	44
Concentrates and ores	10	20	5

(5) Domestic copper consumption (% volume of production)

1968	1975	1979
1.6	6.3	7.1

(6) Share of copper exports in total mineral exports (%)

1950	1960	1970	1979
25	49	60	45

(7) Evolution of copper exports (1963 = 100)

Indices of:	1969	1971	1975	1979
Value	304	201	178	835
Volume	123	120	93	309
Price	247	168	192	308

(8) Form of access to the world market (% value of exports in 1980)

Product	Consumers	Traders
Concentrates	87	13
Blister	96	4
Refined copper	58	42

(9) Destination of copper exports (%)

Market	Concentrates		Blister		Refined copper	
	1975	1978	1976	1978	1975	1978
ALALC	-	4	-	-	22	15
Western Europe	5	10	54	20	22	33
Socialist countries	49	23	-	8	26	5
North America	20	11	-	35	30	30
United States	20	6	-	35	30	30
Asia	16	52	46	37	-	17
Japan	16	52	46	37	-	17
Total	100	100	100	100	100	100

(10) Share of copper in Peruvian exports (%)

1977	1978	1979	1980
23	22	20	16

Source: F. Sànchez Albavera, Minería, Capital Transnacional y Poder en el Peru (DESCO, 1981).

TABLE 39

MEXICO: VOLUME OF PRODUCTION OF PRECIOUS METALS AND NON-FERROUS MINERALS

		1980	1981	Relationship 1981/1980 (%)
Gold	(Kg)	6 096	6 319	3.7
Silver	(Kg)	1 472 557	1 654 829	12.4
Lead	(metric tons)	145 549	157 384	8.1
Copper	(metric tons)	175 399	230 466	31.4
Zinc	(metric tons)	238 231	211 629	-11.2
Tin	(metric tons)	60	28	-53.3
Antimony	(metric tons)	2 176	1 800	-17.3
Bismuth	(metric tons)	770	656	14.8
Cadmium	(metric tons)	1 791	1 433	-20.0
Tungsten	(metric tons)	266	199	-25.2
Molybdenum	(metric tons)	74	451	509.5

Source: Secretaría de Patrimonio y Fomento Industrial.

TABLE 40

PERU: EVOLUTION OF MINERAL PRODUCTION BY SIZE OF PRODUCTION UNIT

	1968	1970	1975	1977	1979
A. Copper (thousand metric tons)	211	220	175	336	397
Large-scale mining (%)	79	74	71	87	89.4
Medium-scale mining (%)	18	23	27	12.6	10.1
Small-scale mining (%)	3	3	2	0.4	0.5
B. Lead (thousand metric tons)	163	164	168	178	184
Large-scale mining (%)	32	31	32	36	36
Medium-scale mining (%)	61	65	67	62	58
Small-scale mining (%)	7	4	1	2	6
C. Zinc (thousand metric tons)	339	360	433	477	490
Large-scale mining (%)	41	42	42	42	41
Medium-scale mining (%)	57	57	57	57	56
Small-scale mining (%)	2	1	1	1	3

Source: Ministry of Energy and Mines.

TABLE 41

PERU: STRUCTURE OF PRODUCTION OF MAJOR MINERALS

(% volume of production)

	1950	1960	1970	1979
A. Copper	100	100	100	100
(a) Refined	69	16	16	51
(b) Blister	8	74	64	44
(c) Concentrates and ores	23	10	20	5
B. Lead	100	100	100	100
(a) Refined	52	56	46	49
(b) Concentrates and ores	48	44	54	51
C. Zinc	100	100	100	100
(a) Refined	2	21	24	16
(b) Concentrates and ores	98	79	76	84
D. Silver	100	100	100	100
(a) Refined	46	41	43	57
(b) Unrefined	54	59	57	43

Source: Figures from the Ministry of Energy and Mines.

TABLE 42

PERU: SHARE OF MINERAL EXPORTS IN TOTAL VALUE OF EXPORTS

	NATIONAL EXPORTS	MINERAL EXPORTS[a]	SHARE OF MINERALS IN EXPORTS %
1950	198	40	20
1960	444	160	36
1970	1 034	462	44
1978	1 941	747	38
1979	3 467	1 397	40

Source: Banco Central de Reserva

a/ Including only copper, lead, silver, zinc and iron.

TABLE 43

PERU: SHARE OF MAJOR PRODUCTS IN TOTAL VALUE OF MINERAL EXPORTS

(%)

	1950	1960	1970	1979
Copper	25	49	60	45
Silver	20	13	6	29
Lead	30	12	8	9
Zinc	25	9	10	11
Iron	-	17	16	6

Source: Banco Central de Reserva