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Mining development and the origin of capital

Patricio Jones *

The present development of Latin American mining depends on several factors, including the existence of natural resources, the geological knowledge of these resources in the countries, political stability to obtain long-term investments and, of course, the capital needed to stimulate this development. The author deals with all these aspects, but he concentrates on the need for capital —the importance of which is increasing in view of the current economic crisis— and above all, on the conditions that would increase the likelihood of obtaining foreign investments, since public and private national enterprises might not be able to cover this need by themselves. He thus suggests the design and application of formulas that take account of both foreign investment and the national interest, although it is recognized beforehand that such formulas are not easily transferable from one country to another.

Having thus expounded the problem, he considers the nature of mining investment, especially the risks and benefits involved in the mining cycle; the present moment in metal mining, characterized by a fall in profit margins; the Latin American efforts to increase national control of mining resources; the function of the State in this sector; and the origin and generation of capital for mining.

In the final part he sums up his suggestions in a number of recommendations such as: to consolidate political and institutional stability, to programme development, to capitalize the national mining industry, to obtain transnational capital and *know-how to* negotiate its use, to balance and restructure the Latin American mining industry, and to reorient regional co-operation along pragmatic lines.

"Mr. Jones is un Argentine geologist who is at present directing some private mining projects in Brazil. The views presented in this article are his sole responsibility and do not necessarily coincide with or represent those of his firm.

I

Introduction

Latin America has been characterized economically as a region on the periphery of world development, and this has become very clear in the current economic situation, in which the economies of the region are accumulating heavy external debts, which, together with their interest payments, are factors that restrict development. Moreover, the region continues to be dominated politically by the myth and reality of *Caudillismo* and is also powerfully influenced by two of the great surviving ideologies of the century: religion and nationalism (O. Paz, 1984). With few exceptions, the present Latin American scene is typified by industries in recession or with low rates of growth and economic and political vicissitudes that affect in greater or lesser degree the developmentalist models applied to the economies of the region.

In a world that is evolving towards the post-industrial society (Toffler, 1985), most of the Latin American countries are still trying to model industrial development processes that they cannot always put into practice or that do not signify social progress. The region has not yet devised a model of its own that will enable it to determine which technological advances are appropriate to the human needs of its regions and culture.

Within this context, with its local variants, the Latin American governments, also with different emphasis, have recognized mining, with its capacity to generate exportable surpluses, as one of the viable solutions for reviving the regional economies. In view of the general shortage of genuinely Latin American capital for investment in mining, we are at present at a stage in which various governments are employing different incentives to capture foreign capital for mining projects in different phases of evolution.

In some cases, the scarcity of Latin American capital in mining does not necessarily imply its non-existence, but rather its flight abroad, since investors prefer, as in the case of Argentina to purchase foreign currency and other investments in the United States (M. Bunge, 1985).

Jn many Latin American countries the capitalization of national industry, both private and

public, does not suffice for all the priority investments of development, but even so the role of transnational capital in the local economies is the subject of great controversy.

As regards mining, it is undeniable that for Latin Americans the exploration and exploitation of the subsoil should be carried out with an eye to the national interest. There is argument, however, as to the way to reconcile this interest with the procurement and control of transnational capital in a high-risk activity. National private capital, State capital, and foreign capital have played a part in the mining industry which is not necessarily the same from one country to another.

II

Mining investment

It is necessary to know exactly what mining investment signifies in order to understand the benefits that this activity can confer on the community, the risks that investment in mining involves, and the legal and tax measures that can favour or inhibit the development of mining.

Mining is an industry that creates new wealth, which however is non-renewable. For example, the profit on each new metal deposit discovered in Canada (Snow and Mackenzie, 1981) is around US$ 60 million. The creation of new wealth, through direct discoveries of deposits and wealth generated by the industries connected with mining, such as ore reduction, metallurgy, etc., contributes, in countries like Australia and Canada, around 10% of the GDP and 23% and 21% annually, respectively, of all new wealth incorporated into the economy (Woodhall, 1983).

The collateral benefits of mining —for instance, its influence as a job creator— can be considerable. In countries like Australia and Canada 15 % and 8.2 % of the total labour force is employed in industries related to mining. In the Latin American countries which are net exporters of minerals, mining contributes to the equilibrium of the balance of payments, generates export surpluses, and in the case of some Andean countries such as Chile, Peru and Bolivia, represents one of the most important sectors of the economy.

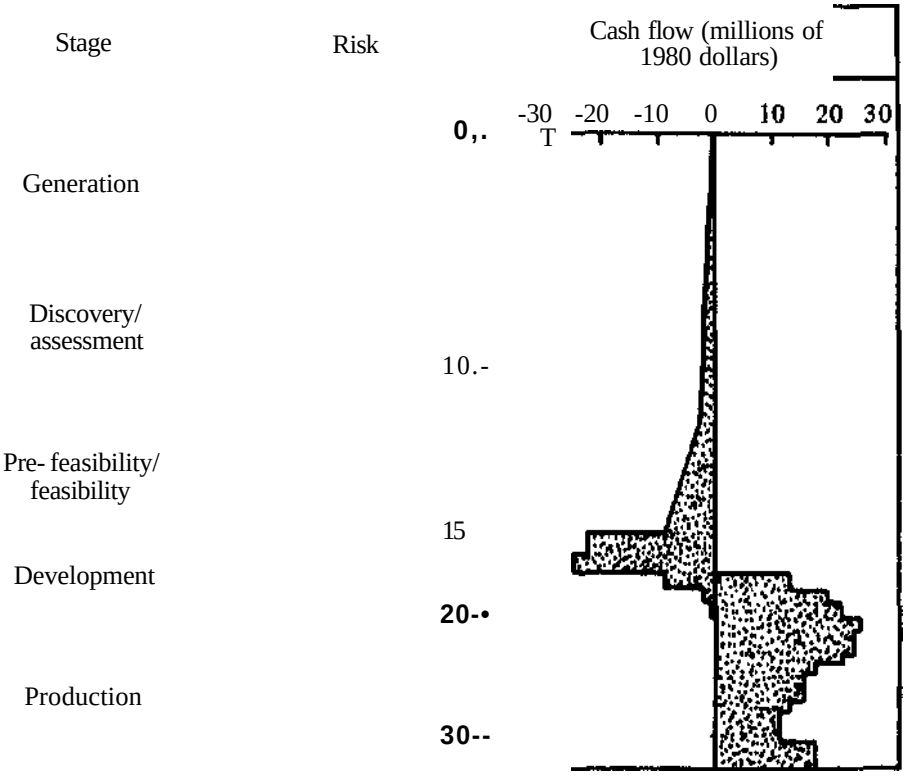
Woodhall (1983) described the mining cycle and the risks and benefits involved in mining projects. In an earlier work (Jones, 1985), I enlarged on several of these concepts in relation to the mining situation in Argentina. The main stages of a mining project consist of generation, exploration-discovery-assessment, prefeasibility-feasibility, development and production (see figure I).

The cycle between the generation of a project and the end of production can last from a minimum of 10 years up to periods of 30 years or more. Each stage has well-defined cash flows, which are negative at the outset, and variable risks which cannot always be fully assessed. I have analysed the risks in some detail (Jones, 1985), but as regards Latin America it must be emphasized that latterly the region has displayed a high political risk in its lack of stability, failure to fulfil signed agreements, absence of long-term mining policies approved by society, etc. It can be stated as a general rule that the main risk in mining, which is the partial or total loss of the capital invested, begins with the project at the exploration stage and gradually diminishes up to the production stage.

As the mining industry is subject to price cycles which are characteristic of the different mineral markets and which are of shorter duration than the useful life of a project, measured from its generation to the end of production, mining companies financed by private capital argue that legal and tax policies should allow the profits of the high-price cycles to accumulate and not be taken away through taxation surcharges, so that the mining industry can finance exploration in the subsequent mining cycles (Woodhall, 1983).

Figure I

MINING CYCLE-RISK AND CASH FLOW (FROM WOODHALL)



III

The present situation in metal mining

World metal mining is passing through a period of decline in profitability. The factors contributing to this include the increase in the size of the reserves, together with the ease of access to reserves of low production costs, variations in consumption, including substitution; and, especially, from 1975 onwards, a variation in the cost structure due to the rises in oil prices.

The increase in the availability of metalliferous resources is illustrated in the following table:

CHANGES IN RESERVES, 1950 TO 1981

Over tenfold increase	Threefold increase or over	Twofold increase or over	49% to 99% increase	10% to 39 increase
Phosphates	Chromium	Lead	Asbestos	Antimony
Platinum group	Cobalt	Manganese	Bauxite	Diamonds
Potassium	Fluorite	Molybdenum	Silver	Gold
	Iron ore	Nickel	Tin	Tungsten
	Sulphur	Zinc		

Source: Stanford Research Institute.

With this increase in world reserves, the projects or mines which are most profitable (generally as a result of higher ore contents) have survived, while other projects remain still undeveloped.

Taken together, aluminium, chromium, cobalt, copper, iron, manganese, nickel, platinum, steel, tin, tungsten and zinc represent from 80% to 90% of the total value of world mining output. The total demand for these 12 metals (including steel) grew constantly from the 1950s to 1975 at rates varying from 100% to 500%.

From the mid-1970s onwards, mainly because of the onset of the oil crisis and its effects on the world economy, the mineral market (metallic and non-metallic) has suffered a widespread fall in consumption. For instance, during the period 1972-1980 there was a decline in the consumption of copper, lead and zinc per unit of production, mainly in the motor-vehicle industry. During this period aluminium has been one of the metals that has increased in consumption, owing mainly to its light weight, which enables it to compete in the motor-vehicle industry and to replace tinplate in packaging.

There has also been an increase in titanium consumption, through its wider application in aviation and other specialized industries, as well as in the consumption of some rare-earth minerals.

Several studies, such as that given in the American Mining Congress Journal of 11 February 1984, consider that for some metals the growth of consumption is very slow: aluminium 3-6%, cobalt 2.1%,copper 1.4%, lead 0.5%, zinc 1.9%, etc. Although the growth rates predicted worldwide are lower than those of the 1970s, one of the regions of the world that might show a greater increase in metal consumption as a result of the promotion of industrialization is precisely Latin America.

As a result of the increase in the available mineral reserves and the fall in consumption caused by many factors, among them substitution, we are witnessing a significant fall in the real prices of minerals in general. Since at the same time real production costs have risen because of the increased cost of fuels and energy, mining profits have fallen and many mining companies periodically experience financial problems.

This situation has resulted in widespread difficulty in obtaining risk capital for mining, and firms have had to resort to credit from third parties, which in its turn has made the profits of mining projects extremely sensitive to international interest rates.

IV

The present situation of Latin American mining

The history of the postwar period shows a constant effort on the part of Latin American mining to obtain control of its mining resources. In an increasingly integrated world economy, the Latin American countries have tried to develop their energy resources with policies that give effective control of these resources to the State enterprise, together with policies of granting concessions, especially for oil prospecting. Some joint ventures, such as that of Cerro Matoso in Colombia (coal) and the exploration for uranium in Paraguay, indicate some presence of foreign capital in the energy field.

As regards metal mining, in countries like Chile, Peru and Mexico, the originally foreign financing was followed by the nationalization of the investments, which is interpreted as a trend towards equilibrium between national and foreign capital.

The desire to administer and employ national mineral wealth in the national interest and the excesses committed by multinational capital in the mining industry (Deverell, 1975) and in other fields (Lozada, 1973) have given rise to new forms of adjustment and association. In the last decade there has been the example of the Brazilian case, in which mining development has been promoted by public and private national capital, together with foreign capital. There have also been attempts at joint ventures between State enterprises and foreign capital. Examples are Cerro Matoso (Colombia-Billiton), Americano do Brasil (Metago-Shell),

etc. This brings us to the situation as it stands today. Chile and Peru, with outstanding mining development in the regional context, are beginning to suffer the obsolescence of some of their equipment and the need for capital to keep exploration alive; Brazil is endeavouring to recover former growth rates and to balance the function of foreign capital with the social needs of primitive self-employed miners; Bolivia is attempting to revive its mining sector, which has stagnated through lack of investors, political problems, and the low price of tin; Venezuela is re-examining its metal mining policy, traditionally second in importance after petroleum policy; and countries like Ecuador and Argentina are devising mining policies designed to attract investment.

Within this setting, I contend that Latin America is one of the regions of the world that offers the most potential attractions for mining investment. I have already analysed the reasons for the attraction it offers to mining, which are mainly based on lower geological risks (Jones, 1985). The potential for finding deposits of high-grade ores in which the cost-benefit ratio allows higher dividends is greater than in regions of the world already geologically explored. But this factor is not, or at least has not been hitherto, conclusive for foreign capital investment. This is due to certain intrinsic factors, some already mentioned, such as political fluctuations, and also to some extrinsic factors, which we will now consider.

V

The function of the State in mining

The function of the State should be to create a mining policy that will be known and accepted by society and to maintain it through political changes, in order to give long-term investment the stability that will allow it to be profitable. Within this policy, the legal framework should lay down the benefits that the community and the country in general should derive from each mining project and should channel part of those benefits into the region where the non-renewable resource is being exploited. The State should invest in the study of its own geology, since it is difficult to negotiate without knowing one's own potential.

Almost all the South American countries are seriously deficient in their geological surveys and regional geophysical coverage; this is the case, for instance, in Bolivia, Peru, Ecuador, Colombia, Venezuela, the Guyanas, Suriname, and the Amazonian sector of Brazil; in the southern sectors of Argentina and Chile; in Paraguay and Uruguay as regards geophysical complementation, etc. It should be a specific function of the State to provide investors with a minimum data bank which will enable them to know the geological risk involved.

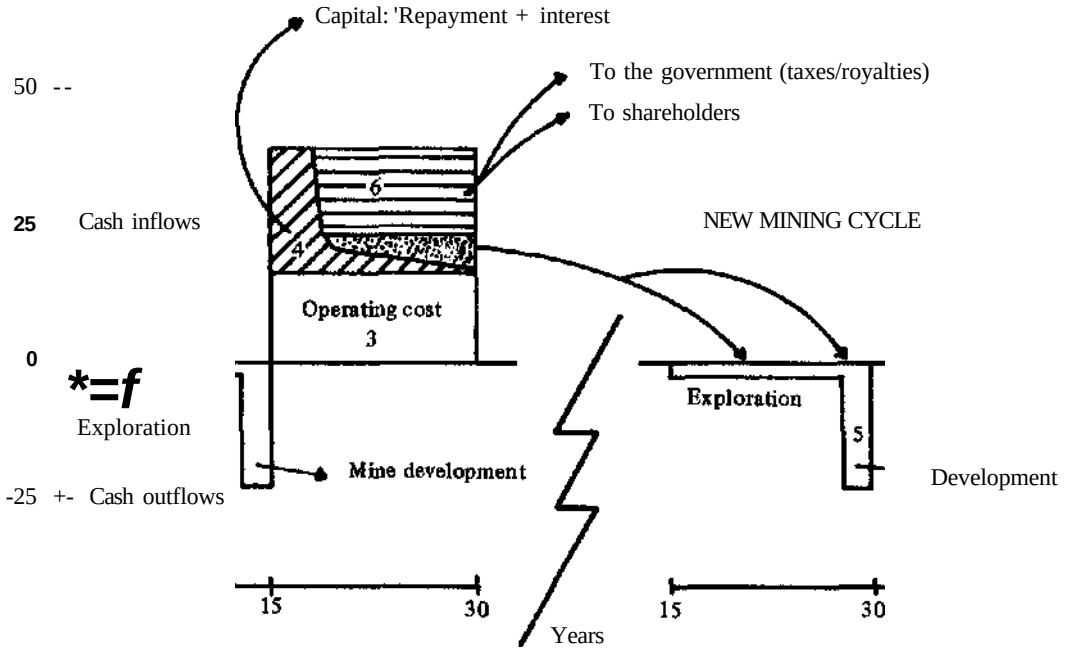
Recently investment by Canadian and German State institutions has helped to ascertain the geophysics of the States of Goiás and Minas Gerais in Brazil. This type of technological and financial assistance is highly beneficial and should be imitated.

The State should foster the development of small and medium-scale national mining and create suitable conditions for risk capital to be attracted to mining. It should make known not only the mining risk but also the enormous benefits for investment capital involved in some mining enterprises and the ways in which they affect the country.

Figure II, modified from Woodhall, shows the benefits from a typical mining project. In the figure it is assumed that the project was financed entirely by foreign capital, and area 4 represents the remittances of foreign exchange abroad in respect of the invested capital and the interest on it. In this case the figure shows remittances abroad which would enable the capital and interest to be recovered in the shortest possible time, which is generally achieved by first exploiting the best part of the mineral deposit. The country benefits from area 3, because part of the operating costs are salaries and spare parts bought in the country; from area 5, if the prospecting capital is reinvested in the country; and from the part of area 6 which corresponds to taxes and royalties on the mineral extracted. Still with reference

Figure II

BENEFITS FROM A MINING PROJECT



to figure II, if national capital took even a minor part in the project, some of the dividends and profits on the capital invested would also remain in the country of origin.

Certain mining projects must be negotiated with foreign investors, especially those that require large investments (more than US$ 50 million) or those that need a fixed buying market, or any number of other cases in which the project is only feasible if negotiated with foreign investors. In these cases the State should train its negotiators and maintain permanent teams through all the political fluctuations. In this sense, the negotiation of mining resources is a professional speciality which, if not available in the country might well be contracted, as happens in some countries (Papua-New Guinea) when negotiating the exploitation of some of their mineral resources.

The legal framework should be clear, especially in respect of foreign capital and the profitability of the projects. It is not only necessary to stipulate the amount of capital that can be repatriated and the levels of taxation and reinvestment in the country, but also to make special arrangements concerning projects of exceptional profitability. Projects that recover the investment in two years of production for useful lives of over ten years call for special legislation which should be anticipated by the code before their discovery. In the previous example: What is the benefit to the nation if, from the third year of life onwards, this project still comes under a law designed to give fiscal benefits in order to attract risk capital?

I believe that the mining policy of the Latin American countries cannot be restricted to the attraction of overseas finance or the provision of incentives for small-scale mining. These countries should also apply policies of support for medium-scale mining in order to form national capital, like those which once functioned or are still in force in Peru, Chile, Bolivia and Mexico, among others. It is indispensable to have some private national capital in the mining industry of each country. Tax exemptions and other incentives could be established, provided that there is effective control over the enterprise benefited and verification that the total benefit is invested in the mining project itself.

VI

The origin and generation of capital for mining

The function of the State as generator of risk capital for mining has recently been analysed by Stobart (1984), among others, and it is not my intention to enlarge on the subject. It is obvious that in the present state of the Latin American economy, some governments have other priorities, and the countries with a mining tradition like Chile, Bolivia, Peru and Mexico still need overseas capital to complement their own.

I shall examine in broad outline the traditional ways in which risk capital has been generated for mining. By and large, it was non-diversified companies whose main line of business was mining that dominated mining investment up to the 1960s, using their own resources or cash flows. It was relatively easy to obtain credit or equity funds, and these served to complement the cash flows. For this period, the generation of funds to finance the mining industry through the internal saving of the mining companies is illustrated by Woodhall (1983), who underscores the need to obtain high profits in order to generate the risk capital needed to finance the subsequent mining cycle (explorât ion-discovery-development and production).

In the 1960s and 1970s, this type of basic financing became much more complicated. Some of the complicating factors were: the intervention of the State, as majority partner or not, in mining investment; the proliferation of mixed companies in order to procure capital and minimize of risks; and, above all, the cost of capital and its interest, and the need to make the best possible use of finance in order to maximize profits (Mikesell, 1984).

In the industrialized countries, the decline in the ore content of their reserves and those of the Third World, inflation, and the generalized rise in costs, further increased by the interest on capital, led to several changes. In order to improve profitability by reducing costs per unit of volume, very large projects were promoted which needed capital of the order of billions of dollars. Many mining companies thus lost the capacity to finance projects exclusively from their own cash flows, and this gave rise to the diversification of the origin of capital (Kostuik, 1984). At the end of the 1970s and during the present decade, the big oil companies appeared on the scene in the mining industry and acquired enterprises with metal-bearing natural resources and energy sources such as coal. Other non-tradítional sources of capital generation also gained importance, such as banks, insurance firms, and companies administering funds. At the world level, there was an enormous diversification of the origin of capital applied to mining. In Brazil, some engineering and construction companies devoted themselves to mining and came to form medium-scale enterprises.

Recently the fall in the profits of a number of mining projects, together with other factors, have caused mining to lose many of these non-traditional investors, such as a large number of the oil companies.

Wilson (1984) analysed the source *of* financing in climates of economic uncertainty, in which factors such as economic cycles, variations in supply and demand, lower prices, higher capital costs and lower profitability affect the procurement and complicate the generation of funds for mining, but at the same time diversify and innovate the origins of finance.

In this connection, innovative fiscal policies (Parsons, 1982) and the attraction of resources from the smaller multinational enterprises and the public market in Canada (Powis, 1984) are evidence that there are various alternative sources of funds for mining. Finance for small and medium-scale mining projects, whose cash flow generally does not attract the larger multinational corporations, may come from the public treasury through the issue of shares or from private capital, through the creation of joint ventures.

The procurement of resources in countries which are traditional consumers of minerals such as the European Common Market and Japan ensures the sale of the output, or part of it, in future contracts, and has the further advantage of guaranteeing prices; this subject has already been debated in ECLAC, and another point to be taken into account in the case of Latin America is the quantity of exportable mineral resources available.

Latin American mining is at different stages of evolution and finance for its development may come from various sources, but at present it is clearly dependent to a greater or lesser degree on foreign investment.

As regards overseas capital, the success of each Latin American country in obtaining the capital necessary for the development of its mining projects will depend in part on the project in itself, on factors such as competitiveness at the world level, the presence of local capital willing to share in the investment, and the confidence generated in the project. It will also depend on factors intrinsic to each country, such as political stability, profitability rates and the taxes placed on the repatriation of the invested capital. Outside factors such as prices in the international market and the reserves of the purchasing country also play decisive roles, but the basic factor is usually the long- and medium-term policy of the investing enterprise. The diversification of transnational capital and of its enterprises, and their overall view of the world economy, mean that at present the Latin American countries are competing among themselves for mining investment. Although no specific rules can be given as to which projects might be more attractive to capitalists, it may be suggested, in general, that such projects will be those of greatest profitability, or those which allow for specific technologies, including those in which domestic demand for the mineral consumes part of the output or for which there is an assured external demand.

Owing to the low prices of the metals and the cost of capital, certain types of large mining projects —for example, those producing basic metals (copper, lead, zinc) at the rate of 100 to 170 tons a day, or aluminium projects smelting 450 000 tons a year— are not profitable enough to obtain the capital needed to develop them (over US$ 500 million). Hence the Latin American countries with medium-scale projects of high unit value involving precious/volcanic/epithermal metals or massive-sulphides may be currently more attractive to transnational capital if they can show political stability, security of ownership and of remittances of the invested capital, etc.

VII
Seven remedial prescriptions

The development of mining depends firstly on the existence of the natural resource and after that on the country's geological knowledge of its resources, on the stability needed to allow long-term investment planning, and on the generation or attraction of capital to finance and renew the mining cycle.

In Latin America the interaction between these and other factors has resulted in uneven exploitation of mining resources and frequently the lack of the basic conditions —stability and geological knowledge— has delayed or prevented the procurement of the capital needed for mining development.

Seven proposals are put forward below for measures to remedy this lack of capital.

Stability

We have seen above that the mining cycle needs time to produce benefits. A country that is institutionally stable, where there is a defined mining policy coherent with its needs, which has the support of the entire nation and provides for the minimum investments needed for the study of the country's geology, and where the legal framework is clear, represents a lower risk, and as such is more attractive to the national or transnational investor.

Programming development

As far as capital is concerned, the mining policy should have the specific guarantee of the government and the opposition, in order to avoid fluctuations that affect the mining cycle. Basic questions needing replies and programming are: What mining development project is expedient for the country? When this project has been identified (whether it be import substitution, export, development of specific minerals such as fertilizers for agriculture, etc.): can the national industry and the State finance it? If not, as is normally the case in developing countries: where will the capital come from to finance the mining development project? How is such capital *to* be attracted?

Capitalizing the national mining industry

The ideal would be to achieve an autonomous and self-sustaining local mining industry, but this is not attained even in the countries with the greatest mining tradition, for in them the capital is of both national and transnational origin and there is always a lack of certain minerals that have to be imported.

Latin America depends on foreign capital for its development, and mining is no exception. Since this is a high-risk industry, Latin American capital prefers other investment options. Government measures to promote investment in the local mining industry and its capitalization, and the repatriation of risk capital for mining, are desirable and necessary, but they should be recompensed by the local mining authority which should assume part of the risk. One of the most usual ways of minimizing the risk is the formation of mixed societies.

Procurement of transnational capital

The procurement of transnational capital to finance projects is a vast subject with undoubted ideological and political connotations. Without enlarging on these aspects, which should be the subject of constructive debates, we can see that in the world of today capital finances a wide variety of projects in which the partners share benefits above and beyond their ideologies. Hence capital is not the nub of the question, but rather the use that is made of it and its benefit to the nation,

The situation of the world economy shows us that external finance is of supreme importance for Latin American development. What that development should be is part of the debate proposed by Paz (1985). It is also an obvious fact that both transnational and national capital seek basically to maximize their profits. How can this be reconciled with the goal of attracting foreign capital and maximizing for the country (see figure II) the benefits of the mining project?

Experience indicates that he who controls the finance generally has the power to maximize his profits. We believe therefore that the policy for attracting foreign capital should primarily consider how to procure and how to negotiate this capital, on the premise that the term "control" in this case is relative and depends on bargaining capacity.

The capacity to promote projects includes the identification of possible investors in order to publicize the projects by adequate means in suitable fora and the formation of teams of specialists in mining economics who can negotiate with the backing of political stability within clear legislative and fiscal frameworks with precise limits, so as to secure the retention in the country of benefits proportional to the profits of the project.

Negotiating with transnational capital

A phrase used by the Brazilian minister O. Aranha has been difficult to apply in Latin America: "It is not a question of shutting the doors against foreign capital, but only of keeping the keys in one's own hand".

How should one negotiate, where are the limits, what control can keep the keys in one's own hand? My suggestions do not claim to be definitive. Starting from the premise that it is always necessary to consider which investor will leave most advantages for the country, there are innumerable factors that can affect the expediency of choosing one source of finance rather than another. Should one choose the investor who ensures a buying market (EEC, Japan, Brazil, etc.), or one who provides specific technical know-how *{solution mining* from France; *heap-leaching* from the United States or Canada; *shaft-sinking* from South Africa, etc.)? Which investor satisfies the capital needs of the project and which provides capital at a lower cost (the big transnationals, medium-scale enterprises, the public investor, or a combination of several of these)?

I believe that every fruitful negotiation or association implies concrete benefits for both negotiators: the sovereign nation and the investor who assumes the risk. The errors of the past taught a lesson, both to Latin America and to a number of transnational corporations; hence both sides now know how to negotiate more successfully (with advantages for both sides). In this context, the setting up of mixed companies with local capital are a *sine qua non* when some mining companies consider investing in developing countries.

For Latin Americans, knowing how to negotiate should mean knowing not only their own resources and risks, but also the structure and organization of transnational capital and the enterprises that finance mining. How are their executives handled, which minerals do they work, in which countries are they active, what is their knowledge of Latin America, etc.?

Balancing and restructuring the Latin American mining industry

Balanced and harmonious mining development, as far as the origin of capital is concerned, is that in which the investments include both national capital (whether private or public) and transnational capital.

Balance in mining development does not concern only capital, but also labour. It has often been said that the greatest capital of enterprises is their manpower. Nevertheless, in Latin America we have had many examples in the recent past of the exploitation of workers, and not only by transnational capital but also by local entrepreneurs.

The maximization of the gains of a mining project implies not only the capitalization of the national enterprise but also benefits for the Latin American workers and professionals, who should share in the profits. Mining enterprises need to be restructured in order to promote participation and co-management by their employees.

The fact that workers are represented on the board of management or share in the profits by capitalizing their labour in the form of shares or dividends (gainsharing) can only foster their sense of responsibility towards the enterprise and their country.

Latin American co-operation: other ideas

Ideas on Latin American co-operation have been examined by Le Guay (1985) and mining could enter into the general context of this co-operation.

Would a Latin American multinational mining enterprise be possible? Or would it develop into a place for the advancement of personal interests and bureaucracy? If a beginning were made with bilateral agreements to satisfy complementary regional needs (petroleum, copper, sulphur) and if Latin American trade in minerals were strengthened through State or private marketing companies, some definite targets would already have been achieved. Examples of mining complementation might be iron ore and lead-zinc in the case of Brazil and Argentina.

Some Latin American countries might even attract investors by Unking the external debt with mining. The conversion of part of the external debt —specifically that part with a doubtful chance of collection— into risk capital applicable to projects in the debtor countries is now being studied by some banks. Some mining projects might be converted into risk capital as payment for outstanding debts, provided that the risk were quantified and negotiated. These and other ideas, as O'Donnell (1985) notes, will depend primarily on the vision, courage and capacity of the political leaders of our countries to present their peoples with genuine options.

"Money talks", and the possibility of achieving equilibrium must be sought through Latin American unity. Everything can be achieved if one has the stature to achieve it.

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