

State mining enterprises and national economic development

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The contention of my paper is that there are still ways, explored only to a limited degree in recent literature, by which state mining enterprises can be used for enhancing national economic growth. They require, however, a judicious combination of government planning and automatic incentives. In reviewing recent literature, two main topics emerge that I do not want to deal with here.

First, the *criticism of overcapacity*¹, falling prices and relative marginalization of Third World mining, by which state mining enterprises tend to become a burden for the foreign exchange position of Third World countries.² This argument advocates more institutionally established cooperation with TNC mining enterprises in order to benefit from vertical integration, better marketing and risk-sharing foreign capital.

Secondly, *criticism of inefficiencies* in managing state mining enterprises, due to which possible differential rents based on better natural resources in relation to competing enterprises, based on low quality deposits, are wasted on consumption within state mining enterprises. This argument is put forward in order to advocate more liberalisation or more autonomy for the respective enterprises.

I do not deny that these are important problems. But even if they were resolved, any analysis of the possible contribution of state mining enterprises to national economic growth would still be limited to the means of appropriating possible rents for national development purposes, to be defined and executed by national planning agencies. With a very radical approach there could even be a split between the state mining enterprises, which produce minerals, and the rent-collecting agency, which determines monopolistically the sales of the products, as in Algeria with the restructuring of SONATRACH in the early eighties³. Such a general analysis of how best to allocate income generated from mineral exports is certainly useful, but it would

leave out other possible contributions of state mining enterprises to economic development.

Mining was a powerful leading sector for industrialization in today's developed countries of the West and the East

In concentrating on the problems of mining in Third World countries, we often overlook the fact that, historically, mining has been a pull sector for industrialization. Mining has provoked the creation of a whole railway technology. Starting in underground mines this technology was later applied to short-distance transports and led to the railway revolution. Steel-making technology, canal construction and the steam-engine have probably been advanced considerably because of the mining sector.

We must therefore ask why mining sectors in the Third World do not provoke similar fundamental transformations in the economic structures of their respective countries. The controversy over whether or not mining creates infrastructure and skills seems minor when confronted with the transformations that mining has triggered off in the industrial countries in the last century. I therefore do not discuss to what extent roads, railways, the professional training of a limited number of workers employed in mining enterprises in Third World countries, constitute an asset for national development. Any reply to this type of question should be a nuanced one, which would have to balance these effects against the creation of a more or less enclave pattern relation of the mining sector to the rest of the national economy. Infrastructures and professional training can only promote national economic development if they provoke a diversification of the productive structure through industrial growth.

That mining countries have been rather inefficient in promoting such diversification is a fact unanimously ex-

pressed in recent literature⁴. The reason is simple: mining normally provides the economy with foreign exchange and a foreign exchange rate which discourages industrial and even agricultural production for the export as well as the local market, if appropriate development policies are not applied in order to counteract this specialization⁵.

Industrial underdevelopment and the emergence of state mining are two aspects of the process of underdevelopment, and of the attempts to counteract it

The reasons for the development of mining in the Third World are well-known. The depletion of rich deposits near the centres of consumption of minerals has made rich Third World deposits competitive first in regions of easy access, especially near the coasts of the countries of the South. This means that the increase in performance of mining equipment in the North has been counteracted in the industrialized countries by the decrease in the quality of ores mined.

The production of equipment, however, is concentrated to the industrialized countries. The increase of the performance-cost ratio of mining equipment may have been faster or slower in relation to the increase in other machine-building industries in the West. In any case, however, there has been a considerable increase in the productivity of mining equipment in line with average productivity increases in the industrial countries.

The competitiveness of Third World countries in mining reflects the fact that productivity has reached the same level as in the industrial countries, whereas productivity in other industrial production lines lags far behind, especially in the construction of mining equipment which has become progressively heavier⁶. Recent developments in Third World mining show that the tendency of

capital-intensive technologies to lower unit costs of production at any rate of real wages has been enhanced. This tendency was already visible at the start of mining production in Third World countries around the beginning of this century. There are only a few exceptions to this tendency, eg, tin mining in Malaysia. The superiority of capital-intensive technology applies also to equipment for mineral processing where technologies have become more and more capital-intensive.

Difference in productivity compared to the leading industrial countries is the characteristic of what I call underdevelopment: "Structural heterogeneity".

Structural heterogeneity is defined as diverging total factor productivities in different production lines. Such divergences are in complete contradiction with orthodox liberal or Marxist economics. Both schools assume a mechanism of equalisation of factor productivities through price and factor movements. Structural heterogeneity has two consequences:

Higher factor productivities in one production line allow the appropriation of rent. This rent may be hidden in an overvalued exchange rate. It may be appropriated through taxes. It may appear as profits in monopolistically operating enterprises⁷.

Diverging factor productivities do not allow the restructuring of the productive apparatus by market mechanisms in the event of changes in demand. Import-competing production lines may have even too high costs in the event of raising prices when levels of productivity are low compared to the mining sector.

It should be noted that productivity in the Third World countries compared to the industrial countries is lowest in the labour-intensive sectors in which high technology and equipment is produced. This applies also to the machine-building sector. New machinery is introduced only if it lowers unit costs. Technical advance in machine-production increases

the performance-cost relation of the equipment, which under competitive conditions will lead to productivity increases in the production lines that use that machinery. Technical progress is in this way partially transferred to the users of the machinery both in the industrial countries and in Third World countries in the form of an increase in the ratio between production and capital costs, ie, capital productivity. Third World countries do not participate in the accumulation of know-how in machinery production nor in the resources for financing research and the development of the next generation of machinery. Benefits reaped by the sellers of the most efficient equipment⁸. The productivity gap widens in the machinery production between North and South.

The specialization of Third World mining countries in mining is based on the fact that productivity in other export-oriented or import-competing industries is considerably lower than in the mining industry. This structural heterogeneity could only disappear if prices for raw materials were to go down. As the price-elasticity of demand for minerals is low, total foreign exchange earning will decrease, as long as productivity in export-oriented or import-competing industry does not increase. However the deterioration of the foreign exchange position which this solution implies is politically unacceptable.

The emergence of state enterprises in mining is based on structural heterogeneity

The structure of the productive apparatus of Third World countries implies that we can expect industrial diversification to be most easily achieved if investment goods, especially machinery, are imported, due to the fact that locally produced machinery is characterized by a much lower performance-cost ratio. Accumulation thus depends on the volume of foreign exchange. This has led to the

debate on declining terms of trade, which only damage underdeveloped countries because they do not possess a diversified production structure. From this debate and from differences in natural resources endowment between industrial and underdeveloped countries, the demand for better raw material prices and rent appropriation through taxes and – given the transfer pricing practices of affiliates of vertically integrated TNCs – nationalisation has emerged⁹.

The state mining enterprise is based on an attempt to appropriate the mineral rent. This mineral rent is based on structural heterogeneity, high productivity in the mineral sector in relation to the rest of the economy.

Rent is an ambiguous income. It is a source for financing industrial restructuring and diversification, but rent is not automatically used for this purpose

In contrast to the profit receiving capitalist, the earner of rent is not compelled to invest it in technical progress in his plant¹⁰. If he uses the rent for expanding production he may even have to cut his prices. This would lead to the disappearance of rent. In order to transform rent into productive capital, the rent must be shifted to production lines outside the rent-generating sector. In these production lines profitability is lower than in the rent-generating sector. Therefore, such a shifting of financial resources to low productivity branches requires political intervention.

Rent allocation as well as rent appropriation requires state intervention. Any discussion about the inefficiencies of state mining enterprises and of government intervention in the economies of mining countries should take into account the fact that the use of the mining sector for the promotion of economic diversification requires state intervention if the economy in question is not pre-

pared to forego available foreign exchange earnings by expanding mineral production and by lowering the international value of its national labour power to levels where new export and import-competing industries become competitive¹¹.

The question how to use rent in the most efficient way can only be answered in the framework of a general discussion of how to overcome underdevelopment through local machinery production, selective machinery import and the expansion of the local mass market. My conclusions on this problem have been stated elsewhere and will not be repeated here¹².

But one remark is necessary: without creating a local machinery production capacity, the link between imports and accumulation cannot be broken¹³.

The attempt to diversify in downstream operation by processing raw materials

A certain number of countries have diversified their productive apparatus through processing raw materials. This attempt has been thwarted by the monopolistic practices of TNCs, by barriers in the industrialized countries and by various objective factors. My contention, however, is that diversification through the processing of raw materials will not lead to the structural transformation of the economies of the Third World, if very implausible conditions are not met.

Let us first state that there have been late-comers in industrialization who have been able to diversify through raw material processing. The successful examples, for instance the Nordic countries in the 19th century and Cuba, have transformed their raw materials by building the necessary equipment locally. This has been one of the bases of their machine-building industry¹⁴. Processing with the use of imported equipment, on the contrary, will not greatly

contribute to local technical capacities nor to local earnings. Mineral processing has become very capital-intensive and technology which can be produced locally is rarely available. An increase in earnings may occur through processing. Retained earnings will increase considerably in relation to investment in other production lines if the following drains on foreign exchange do not outweigh additional earnings: financing charges of capital invested in processing. If capital productivity is low in processing, capital servicing will constitute a waste of resources in relation to alternative equipment imports. Economies of scale: the high degree of sophistication of technology and marketing problems are the main reasons for a low degree of capital productivity in Third World mineral processing compared to production sites in developed countries¹⁵. The local content of fixed capital in mineral processing is low. Multiplier effects are minimal and mostly restricted to construction. The considerable difference in local content between the Brazilian petrochemical industry and the Arabian petrochemical industries shows that raw material processing can have a pull effect only if conscious efforts of promoting metal working (and not of promoting mineral processing) have been achieved¹⁶.

It may certainly be attractive to consider that the share of the mineral producer in total value added of final products should be raised. But as value added is — under competitive conditions — the result of the cost of factors employed at the various degrees of manufacturing of the product, an increasing degree of processing will lead to increasing growth of value added in Third World countries, if the “factors of production” required can be produced locally, at least to a certain degree, and at costs which allow competitive prices for processed products without lowering the entry prices of minerals used below the world market price. Engaging in processing by offering such lower prices could how-

ever be justified, if technologies locally produced were available. An enlarged market for such technologies would constitute the basis for local equipment production which in turn would broaden the skill basis of the society.

Increased processing of minerals should be evaluated by state-mining enterprises from the point of view whether technology can be depackaged and to what extent components of such plants can be produced by the local industry at reasonable costs¹⁷.

The attempt to diversify upstream

It is probable that the mining equipment is less sophisticated and more general purpose than in the downstream area. Lorries, derricks, hoists, shovels and conveyors belts used in mining may be of sophisticated types and may reduce costs. But this equipment only allows a command of metal work, casting and milling, whereas mineral processing would require chemical processes, special alloys, etc. In addition, heavy equipment can be replaced by less heavy equipment in mineral production based on rich deposits. This may raise costs. But if this lighter equipment is produced locally, the rise in cost is offset by the creation of a local metal working industry.

At least in the first phase of industrialization, a mastery of metal working is essential, because all machinery is comprised of judiciously conceived and precisely worked metal parts.

Producing at higher cost with locally manufactured equipment implies that the mineral rent is transferred as a subsidy to the local equipment and machine-building sector.

State mining enterprises should thoroughly investigate the possibilities of utilizing the advantages of rich and more accessible deposits than those available to mining enterprises in industrial coun-

tries, accepting higher operation costs than those possible with imported equipment by using locally produced equipment¹⁸. Creating a market in the mining sector for such locally produced equipment would support the expansion of a local metal-working and machinery building sector, which could easily diversify into the construction of machinery for other sectors¹⁹.

New cooperation agreements with international contractors should take account of this problem of backward linkages. The rent can be appropriated in a fiscal form by taxing the products. It can, however, also be appropriated by enforcing higher local participation in the construction of the mining equipment. This could be combined with attractive conditions for metal working and machine building enterprises from the North, especially small and medium-scale enterprises, which have a strong interest in transferring their management and production know-how, because they cannot afford to rely on qualified personnel from their home plant for too long a period²⁰.

In contrast to mineral processing, upstream integration has a greater spread effect because more of the technically down-graded equipment could be produced locally. The products concerned could be also used in other production lines. The skills acquired can be used in the production of other metal goods and machinery.

On institutionalization of the spreading of rent for growth

The now conventional wisdom of criticizing state mining enterprises for high operating costs may appeal to liberal orthodoxy. But it risks obscuring the fact that without state intervention uneven specialization will not provide impetus for technical capacities in metalwork and machine building in the Third World. This is so because the compara-

tive disadvantages of the Third World countries are largest in this sector. Even such countries as South Korea and Taiwan have consciously attempted to utilize cost advantages in their export industries by producing required equipment at initially higher cost. The comparative advantage based on low labour costs in some technically simple industries has been used either to integrate the industry upstream or to subsidize skill formation in technically more complicated industries²¹.

It has been the contention of this paper that the impact of such skill formation in the production of equipment for mining is higher at comparable cost than in mineral processing.

If the state mining enterprises are asked to contribute to overall national development, the onus of the required reduction of operation costs has to be shared. Certainly, the cost incurred by the different purposes assigned to state mining enterprises are difficult to quantify. This may lead to a feather-bedding of management. Imprecise definitions of purposes can lead to the confusion of "necessary", and hence admitted, and unnecessary higher costs. A strategy which taxes mining equipment imports and subsidizes local production of mining equipment could be combined with a simultaneous operation of TNC affiliates and local state mining enterprises. This would give the government the possibility of evaluating necessary costs and would induce the TNC affiliates to transfer themselves or to induce their foreign suppliers to transfer know-how and production capacity to Third World mineral producing countries in the mining equipment sector. State mining enterprises which are run on a commercial basis but to which the increase of local content in equipment is assigned, can be evaluated on the basis of the lower performance-cost relation of such local equipment. Criteria for evaluation will become more objective if higher costs can be measured by higher costs of locally pro-

duced equipment in relation to its technical performance.

Institutionalization of such linkage effects can be promoted in two ways, the regime for equipment imports and the choice of mining sites.

In order to make sure that the productive utilisation of the rent does not depend on day-to-day decisions of administrative agencies and state mining enterprises, the local production of equipment for mining has to be protected. This can be done by devaluation combined with relatively easily administrable export duties on products already competitive at the previous foreign exchange rate. Probably, given the high lag in machine building, further protection for this sector or for some parts of it may be necessary. The precise extent of such measures depends on the degree of industrial development and on the size of the market for mining equipment. As Third World mineral producing is highly concentrated in some countries and as some of these countries are producing various minerals with equipment of roughly the same type, upstream markets may be quite large.

A policy of slowly increasing the local content, similar to that successfully applied in the manufacturing sectors of the more industrialized among the developing countries, may be imitated by the mineral exporting countries, but it must be conceived and announced at the start of the construction, because the whole conception of the mine production process depends on expectations as to the equipment available during the course of exploitation of the mine.

On the other hand, the period of very costly big mining seems to be drawing to an end²². The exploitation of smaller deposits, where the ore is however of higher quality, may narrow down the cost differential between the use of less sophisticated locally produced equipment and very sophisticated imported technology.

More liberalism and less state mining or more efficient state interventionism?

The fact that state mining enterprises have run into a financial crisis is not due to the mere fact that they are state enterprises, but to the fact that in the absence of other profitable production lines, there is a strong tendency to consume the mineral rent. This tendency did not emerge with the state mining enterprise, but existed long before and was quite compatible with private ownership of means of production²³. On the other hand, there are state mining enterprises in developing and developed countries which are quite efficient and which have contributed to national economic development in upstream and downstream production lines.

The pressure by mine workers to consume rents²⁴ does not date from the establishment of state mining enterprises. Very high wages were paid for example in the Chilean copper industry²⁵, long before nationalization, and the conflict between the Allende government and the mine workers was due to the workers' attempt to reduce wage differences in Chile.

The problems advanced against state mining in Third World countries are therefore connected with rent and not with the state ownership of production.

It is only possible to support the argument for the reduction of state ownership of production if private enterprise can be shown to be more efficient in using rent than public enterprise. This contention can be refuted by two simple arguments:

Private enterprise could appropriate rent for itself and — under oligopolistic conditions — maintain a pricing strategy whereby low-cost Third World ores support the continued mining of low grade ores in the West in order to obtain cost reductions as well as security of supplies. In that case, the rent would not be available for Third World countries but

instead contribute to higher real incomes in the North.

It is clear that under the actual conditions of the international system this is politically unacceptable to the South.

Private enterprise cannot channel capital from profitable production lines to less profitable ones. Because of structural heterogeneity, private enterprise in mining can only marginally contribute to economic diversification.

Mining has not discouraged economic diversification in Third World countries because mines were owned by the state, but because productivity levels in mining led to exchange rates becoming too high for other production lines to become competitive.

Therefore, the growing overcapacity in mining in the Third World is also due to the low productivity in other sectors. Everybody tries — instead of attempting the difficult task of economic diversification — to increase mineral production. As this occurs in a climate of mutual distrust between TNCs and Third World countries, in addition to Third World mining capacity increases, Western mining capacity grows even if marginally profitable deposits have to be developed²⁶. Technical progress is oriented to increase productivity from secure but otherwise noncompetitive deposits.

Political distrust, in turn, is the result of the existence of rent. The appropriation of rent is the outcome of a political struggle. The amount of rent is determined by the supply of low-cost minerals in relation to demand. The smaller this supply, the higher the costs for the marginal producer and hence the market price and rent are higher. The appropriation of rent depends on the power relationship between the resource and the producer who transforms the product into a saleable commodity.

As state mining enterprises do not control the production of mining technology nor the production of processing technology and as there are imperfections in the markets for crude, semi-pro-

processed and even processed minerals, state mining enterprises use political power linked to sovereignty of resources in order to match the superiority in bargaining power of TNCs that is based on technology and market access.

It is hence clear that the problems which the world mineral industry faces today are all the result of the economic and political consequences of rent on the national, Third World and the international level. Waste, unwise expansion of capacity, lack of proper accounting, re-deployment of production into secure areas and mutual distrust can be avoided if national economic development of Third World countries no longer depends on rent but on a more diversified productive apparatus. I do not want to discuss here comprehensive development strategies, but it should be clear that only the state can channel rent to production lines where productivity is still low or for which markets will exist only if complementary investment is realized or if increases in consumer incomes create sufficient outlets. What is required is not more liberalism in a general way, but a more efficient state interventionism for promoting economic diversification²⁷.

That rent leads to considerable problems in promoting economic development is well known. Discussing the terms-of-trade problem, H.W. Singer has not only stated that productivity gains of Third World countries may lead to worsening terms of trade but also that good terms of trade discourage diversification²⁸. In addition, the appropriation and the allocation of rent require a centralized economic state apparatus, the functioning of which cannot be adequately described with the categories of the administrative sciences²⁹. This apparatus, by virtue of the importance of its resources in relation to the rest of the surplus in their economies, is not controlled by powerful rivalling social forces which would push it toward economic diversification. Any attempt to reinforce mechanisms which favour the channel-

ling of rent to new production lines should therefore be welcomed.

At the level of the state mining enterprise I see three major mechanisms:

- The rent element in income should be made visible by carefully restricting the multi-purpose functions of state mining enterprises.
- Social services, above-national-average working conditions, overstaffing as a contribution to employment, etc. should be avoided.
- As far as possible, automatic means of rent transfer to production lines which create skill formation in the metal working and machine building sectors should be established.

I have shown that the down-grading of mining technology and restricted access to equipment imports would be such an automatism.

The dependence of a growing number of workers and entrepreneurs on the channelling of rent to the promotion of their production, as would occur if rent was spent for increasing local equipment content, would constitute a counterweight to the consumption of rent within the rent-generating sector.

It is, however, evident that such mechanisms can work satisfactorily only if the overall economic policy of the Third World government in question is committed to the promotion of technical skills and — as I cannot demonstrate here — to the use of a growing mass market for the local production of mass consumption goods with an increasing share of locally produced machinery in order to create a local technical basis³⁰, which in turn will ensure that imported technology not only is consumed but also assimilated, providing thus an impetus toward increased capacity for local technical innovation.

The state mining enterprises contribution to this strategy may differ from

country to country according to the level of industrial development and to the size of the market. But if its linkages are not to be confined solely to rent generating, it has to contribute to this thrust of diversification by adapting its technology to upstream capacities of production.

Notes and references:

¹ Cf.: Thomas Wälde, "Third World Minerals Development, Current Issues", *Columbia Journal of World Business*, Spring 1984, pp 27-29.

² Some Third World authors have foreseen and welcomed the appearance of more competitive world raw material markets. See Carlos F. Diaz-Alejandro, "North-South Relations, The Economic Component", *International Organization*, Winter 1975, p. 226.

³ Cf.: *Révolution africaine*, May 8, 1981, p. 13; November 13, 1981, p. 24; January 1, 1982, p. 28.

⁴ Cf. Oscar E. Munoz, "An Essay on the Process of Industrialization in Chile Since 1914", *Yale Economic Essays*, Fall 1968, p. 167; R. Dan Walleri, "Trade Dependence and Underdevelopment. A Causal Chain Analysis", *Comparative Political Studies*, April 1978, p. 115.

⁵ Nankani Gobind, *Development Problems of Third World Mineral Exporting Countries*, Washington, World Bank Staff Working Paper No. 354, 1979, p. 3.

⁶ This process is aptly described by Jerker Carlsson, "Towards a Methodology for Studying the Impact of the Mining Companies on Host Development Countries", *Raw Materials Report*, Vol 4 No 2, 1986, pp 6-11.

⁷ I have elaborated this point in Hartmut Elsenhans, "Egalitarisme social et critique des modes de production dans la périphérie", Symposium de Paris du 10 octobre 1980, Transfert de technologie et développement, Un débat. Discussion entre MM. les Professeurs Emmanuel et Elsenhans, Paris, IEDES/EADI, 1980, pp 57-60.

⁸ The point is elaborated in Hartmut Elsenhans, "Endettement, Echec d'une industrialisation du Tiers Monde", *Tiers Monde*, July-September, 1984, pp 552-554.

⁹ On new forms of cooperation, see Stephen A. Zorn, "New Developments in Third World Mining Agreements", *Natural Resources Forum*, April 1977, p. 248.

¹⁰ The point is made by Abdellatif Benacheniou, "Le renversement de la problématique ricardiennes, coûts comparés dans la théorie économique contemporaine", *Revue algérienne des sciences juridiques, économiques et politiques*, Décembre 1971, p. 925.

¹¹ A more detailed discussion is to be found in Hartmut Elsenhans, "Rente, sous-développement et Etat dans le Tiers Monde", *Cahiers du CREA*, (Algers) January-March, 1985, pp 5-52.

¹¹ Cf.: Hartmut Elsenhans, "Rising Mass Incomes as a Condition of Capitalist Growth. Implications for Today's World Economy", *International Organization*, Winter 1983, pp 28-34; Hartmut Elsenhans, "Le développement autocentre contradictoire", *Cahiers du CREA*, (Alger) July-September, 1984, pp 7-38.

¹³ The point is elaborated in Hartmut Elsenhans, "Egalité et développement, L'expérience européenne et le monde sous-développe d'aujourd'hui", *Cultures et développement*, No 2, 1983, pp 207-210.

¹⁴ This type of strategy seems to be under discussion in Bolivia, cf.: Theo Mutter, "Can Commodities Solve the Crisis — The Commodity Policy of Bolivia", *Raw Materials Report*, Vol 3 No 1, 1984, pp 16-17.

¹⁵ On higher unit costs of mineral processing in Third World countries, see *Mineral Processing in Developing Countries*, London, Graham & Trotman, 1984, p. 9.

¹⁶ Cf.: A. Ighemat, "Situation et politique en matière de biens d'équipement destinés à l'industrie pétrochimique en Algérie", *Revue algérienne des sciences juridiques, économiques et politiques*, Septembre 1982, p. 435.

¹⁷ On such depackaging in a comparable sector of production, see *Technology for Energy Sector Development in Developing Countries*, Geneva, UNCTAD, 1986, pp 24-25.

¹⁸ That rich deposits may be worked with less sophisticated technology is shown by John I. Thoburn, *Primary Commodity Exports and Economic Development, Theory, Evidence and a Study of Malaysia*, London, John Wiley, 1972, p. 203.

¹⁹ The examples of Ireland and Australia are discussed in Ciaran O'Faircheallaigh, *Mining and Development*, London, Croom Helm, 1984, p. 194.

²⁰ This has been shown by a survey of machinery producing small and medium-scale industries based in South-West Germany, cf.:

Bernfried Moosmann, *Mittelbetriebe und Entwicklungsländer (Medium-Scale Industries and Developing Countries)*, Bern, Lang, 1986, pp 145-154.

²¹ Cf.: Wilfried Holtgrave, *Industrialisierung in Singapur (Industrialization in Singapore)*, Frankfurt, Campus, 1987, pp 70-81; Alice H. Amsden, "Taiwan's Economic History. A Case of Etatism and a Challenge to Dependency Theory", and Carl J. Dahlmann, *Reflections on Korea's Acquisition of Modern Technology*, Washington, World Bank, April 1984, pp 5-32.

²² B. Hindley, "Mineral Exploitation and Third World Policy Towards Mining", in Geoffrey Goodwin and James Mayall, eds., *A New International Commodity Regime*, New York, St. Martins Press, 1980, p. 158.

²³ Cf.: Jonathan V. Levin, *The Export Economies: Their Patterns of Development in Historical Perspective*, Cambridge, Harvard University Press, 1960, p. 7.

²⁴ Criticism put forward by Michael Shafer, "Capturing the Mineral Multinationals: Advantage or Disadvantage", *International Organization*, Winter 1983, pp 115-117.

²⁵ Cf.: Keith Griffin, *Underdevelopment in Spanish America, An Interpretation*, London, Allen & Unwin, 1969, p. 70; Norman Givan, *Multinational Corporations and Dependent Underdevelopment in Mineral Export Economies*, New Haven, Yale University, Economic Growth Center, Center paper No. 182, 1972, p. 520.

²⁶ Marian Radetzki, "Has Political Risk Scared Mineral Investment Away from the Deposits in Developing Countries?", *World Development*, January 1982, pp 39-48; Pierre Noel Giraud, *Géopolitique des ressources minières*, Paris, Economica, 1983, p. 23.

²⁷ Rex Bosson and Bension Varon, *The Mining Industry and the Developing Countries*, London, Oxford University Press, 1977, p. 155; Alfred Maizels, *Selected Issues in the Negotiation of International Commodity Agreements. An Economic Analysis*, Geneva, UNCTAD, January 5, 1982, p. 53.

²⁸ Hans W. Singer, "The Distribution of Gains Between Investing and Borrowing Countries", *American Economic Review*, May 1950, p. 482; Cf. also V.S. Mahajan, "The Terms of Trade between Primary Producing and Manufacturing Countries and Economic Development", *Indian Journal of Economics*, April 1960, p. 360.

²⁹ This point is elaborated in Hartmut Elsenhans, "Capitalisme d'Etat ou société

bureaucratique de développement", *Études internationales*, March 1982, pp 3-22.

³⁰ Simultaneously, policies in relation to improving income distribution that could influence the demand for technology should be explored. Political will and determination would be necessary to strengthen autonomous technological capacity. See "Report and Recommendations of the Workshop on Technology and Planning for Technological Transformation", Geneva, UNCTAD, January 29, 1981, p 9.