State mining enterprises in developing countries: a review of recent literature

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By now it is commonly understood that the major structural transformation that has taken place in the world mineral sector in the last 25 years or so has been the rapid expansion of *State-owned Mining Enterprises* (SME) in developing countries.

Economic research has not kept pace with the growth of SMEs. There are only very few systematic studies on the SME phenomenon. Due to the limited number of empirical studies, very little is known about their real economic performance and their effects on the functioning of world mineral markets.

Though the number of monographic studies on SMEs is small, there are a comparatively large number of publications dealing with specific aspects of SME behaviour. The aim of this paper is to provide a state-of-the-art review by discerning the major issues and bringing together scattered information and various perspectives from the recent literature in the developed market and centrally planned countries as well as in the developing countries.

The plan of the paper is the following. The first section provides a quantitative assessment of the significance of SMEs in world mineral industries. It is suggested that although some differences exist in the various estimates of the state-owned share, depending on how SME is defined, the general conclusion is that they have become important, and in some mineral sectors, dominant actors.

Section 2 discusses the basic reasons suggested in the literature for the establishment of SMEs. Ideology, economic decolonization, controlling the "commanding heights", natural resource rent appropriation, capital intensiveness, the perception of improved domestic capabilities to manage mining operations, maximization of government revenues and foreign exchange earnings, and social goals are offered as rationales for SME expansion.

In section 3 the major characteristics of the goal structure of SMEs are identified. It is argued that SMEs typically face a multiplicity of commercial and non-commercial objectives and in many instances the governments fail to clarify and rank the often conflicting objectives.

Section 4 discusses at length the problems of performance evaluation of SMEs. It is suggested that the complex goal structure and various domestic environmental factors make their performance evaluation very difficult, if not impossible. There are great difficulties in finding a base from which to measure SME performance. Opinions differ concerning the usefulness and feasibility of applying social profitability as the criterion that governments should use to evaluate performance. A major problem is that the non-commercial benefits are exceedingly difficult, or impossible, to quantify due to such factors as distorted prices and the intangible nature of some of these benefits.

Section 5 is devoted to the discussion of the reasons for the inadequate performance of many SMEs. Despite difficulties in measuring performance, most analysts, including many in the socialist and developing countries, express great concern about the low efficiency which seems to characterize the majority of SMEs in developing countries. Contrary to some Western perceptions, the general message of the socialist country literature is that SME inefficiencies are not of an inherently systemic nature and can be rectified with appropriate restructuring and reform measures. Among the reasons for low performance efficiency the following factors are discussed: shortcomings related to the infancy of some SMEs; overly complex goal structure; weaknesses of external public control; distorted and administered prices; low pressure to minimize costs, and over-investment in capacity.

Section 6 deals with the world market impact of the operation and expansion of SMEs. The conclusions, based on limited empirical evidence, are that nationalization did initially raise production costs and reduce output, but the effects on market prices were less obvious. Production costs have been raised by the pursuit of multiple objectives, but there is no clear evidence of higher costs due to permanent inefficiency. Arguments that the output of SMEs is relatively more inflexible over the business cycle and prices, therefore, more unstable than under private ownership is neither proved nor disproved by the limited empirical material. The dominant feeling among Western experts is, however, that SMEs are characterized by greater production inflexibility and are partly responsible for the tendency of over-supply and increasing market price fluctuation. There is considerable evidence that the growth of SMEs has reduced vertical integration in world mineral markets. Perceptions are controversial on the issue whether the emergence of SME is a threat to the survival of private multinational mining companies.

The concluding section presents several policy options, which have emerged in recent literature, to improve SME performance. The following proposals are discussed. Setting clear-cut and attainable objectives for SMEs with the costs of non-commercial constraints calculated and weighed against the benefits to society. Motivation for profit-maximization once non-commercial tasks have been determined and costed. SMEs should be compensated for the social services they are obliged to provide. Where there are price distortions, shadow pricing can be used to evaluate SME performance. Managerial ability should be strengthened by less security of tenure, performance-oriented remuneration schemes and other means.

Relations between the government and the SME should be defined more clearly and operational autonomy of SMEs must be strengthened by reducing excessive government interference.

1. Significance of state mineral enterprises in world mineral industries: quantitative assessments

It is a well-established fact that one of the major structural-organizational changes occurring in the mineral sector over the last 25 years is the explosive growth of mining and mineral processing by state enterprises, particularly in developing countries. There are some differences in measuring the state-owned share, depending on how state enterprise is defined. Government equity holdings, from being insignificant in the early 1950s, have grown to cover about half the metallic mineral production capacity in the Third World (Radetzki, p. 1). In 1981, state-owned sector (measured in proportion to government equity holdings) accounted for 41.1% of bauxite mining capacity, 57.8% of copper mining capacity and 61.8% of iron ore production (Radetzki, p. 20).

According to another estimate, 70% of developing countries' copper mine capacity is effectively controlled by government enterprises (Carnegie, 1985, p. 9). It has been estimated that at the beginning of the 1960s governments had an interest in only 2.5% of the copper industry. By 1970 about 43% of the copper producing capacity in developing countries was owned in whole or in part by governments. Currently in the developing countries about 60% of primary copper output is being produced by majority-owned state enterprises (Collier, 1983, pp 200-201). A Commodities Research Unit study suggests that in 1975 40% of world copper mine output was gained from "non market-responsive" public sector companies, but by 1991 this will rise to 60% (Commodities Research Unit, 1986). By the late 1970s, state-owned suppliers accounted for almost 40% of internationally traded iron ore (Vernon and Levy, 1982, p. 175).

Virtually almost all the largest state enterprises in developing countries are concentrated in natural resources industries: CVRD (iron ore) and Petrobras (oil) in Brazil, NIOC (oil) in Iran, COMIBOL (tin) in Bolivia, Timah (tin) in Indonesia, Ecopetrol (oil) in Colombia, CODELCO (copper) in Chile, PETRAMINA (oil) in Indonesia, Zambia Industrial and Mining (copper), Gecamines (cobalt and copper) in Zaire, PEMEX (oil) in Mexico, etc. (Gillis, 1980, p 23). Some of the developing country state mineral enterprises merit even the multinational label (Petrobras, CVRD, NIOC, Gecamines, ZCCM).

Radetzki comes to the conclusion that the period of fast growth of state ownership may now be over and that in the decade to come an increasingly mature group of state-owned enterprises will be supplying a substantial, but relatively static, proportion of developing country mineral supply (Radetzki, 1985, pp 28-29).

Political independence and the urge for economic emancipation in the Third World, which was a major force behind the many nationalizations in past decades, may have run out of force in the early 1980s. The major adjustments to rectify unfavorable colonial adjustments had already absorbed the most conspicuous foreign ownership positions. Socialist leanings in developing countries appear less in vogue now than in the 1950s and 1960s, and pragmatism has taken precedence over ideology. Relationships between governments in developing countries and multinational mining firms have improved, and amicable joint-venture arrangements for the development of new projects have become common. The emergence and increasing sophistication of private entrepreneurship in developing countries suggests a greater role for private ownership in minerals, at least in future expansion of this sector.

Based on concentration ratios, Labys comes to the same conclusion for copper, tin and bauxite (Labys, 1986, p. 20). Stobart presents a different scenario according to which the proportion of market economy country mineral capacity owned by state interests and located in the developing world is going to increase as indicated by capacity expansion plans and the tendency of some privately owned mining or smelting facilities to close permanently as a result of the prolonged recession, and as others are nationalized to save them from bankruptcy (Stobart, 1984, p. 265).

2. Reasons for establishment of SMEs in developing countries

The reasons for establishing SMEs are usually complex and differ widely among developing countries.

• *Ideology.*
Some countries have an ideological preference for public control, specifically the ideology of socialist thought, wherein the state should own the means of production (World Bank, 1983, p. 50; Sims, 1985, p. 266; Smirnov, 1980, p. 160). Others argue, however, that, except in a few cases, the rationale for establishing SMEs has usually had very little to do with socialist ideology or, for that matter, a coherent ideological framework of any kind (Gillis, 1980, p. 12; Trebat, 1983, p. xv).

• *Economic decolonization.*
Politically, many governments of the developing countries view the establishment of SMEs as an act of economic decolonization and the enforcing of the principle of permanent sovereignty over natural resources. Although, in most instances, formal political independence has already been achieved, the presence of foreign investors in mining was viewed (especially in the late 1950s and 1960) as economic colonialism, which had to be terminated if the nation was to enjoy real political independence. The metropole-hinterland analogy was seen to apply to this situation, whereby the large resource companies have parents located in one country, usually a developed country, and their vertically integrated mining subsidiaries located in developing countries. Government ownership was seen as a way of severing this dependency-creating linkage (Litvak and Maule, 1975, p. 206; Gillis 1980, p. 17; USSR Academy of Sciences Africa Institute, 1982, p. 45; Nosova, 1971, p. 56; Trebat, 1983, p. 34; Vernon, 1981, p. 98).

• *The "commanding heights".*
In this rationale, it is argued that the mineral sector is, owing to its strategic position and the kinds of linkages it generates, so significant for the development process that it cannot be left in private hands, whether the investors are domestic or foreign. Rather, to guarantee socially responsible performance and the maximization of economic linkages from these "commanding heights" of the economy, the state must control these sectors (Gillis, 1980, p. 16; Varughese, 1982, p. 20; Smigol, Faminskiy and Kolesov, 1974, p. 71; Nunnenkamp, 1986, p. 197).

• *Natural resource rents.*
This rationale argues that the private control of a monopoly or the fortuitous ownership of a scarce natural resource generates unearned incomes or rents for their owners. The public appropriation and allocation of rent surplus derived from rich intramarginal mineral deposits are important motivations for public ownership of natural-resource sectors in many developing countries (Trebat, 1983, p. 34; Radetzki, 1985, p. 11).

• *Capital intensiveness, weak private sector and risk.*
In most developing countries only the state or foreign enterprises are able to mobilize the volumes of capital necessary to mount mineral projects. If for one reason or another foreign participation is not desirable, then responsibility for undertaking large projects with "lumpy" capital requirements falls to the state because of the general financial weakness of the national private sector. A particular manifestation of the weakness of the domestic private sector is a small, inefficient capital market. Finally, state participation is motivated by some dynamic market failures resulting from excessive risk aversion and short-sightedness of private entrepreneurs, which prevent them from entering into activities that take a long time to mature. Large-scale projects tend to be especially risky (Gillis, 1980, pp 15-16; Trebat, 1983, pp 31-32; Radetzki, 1985, p. 11).

• *Maximization of government revenues and/or foreign exchange earning.*
Mining projects can be very important sources of revenue to government. In Papua New Guinea, for example, government revenue maximization is stated as the main policy objective for the mining sector, to override all others if a conflict arises. Foreign exchange earnings maximization may be sought by avoiding the remittance of some of the private transnational mineral corporations' profits overseas (Sims, 1985, pp 266-267; Cordes, 1983, p. 26).

• *Perception of improved domestic capabilities to manage mining operations.*
As Vernon and Levy put it (1982, p. 178):

> "The proposition that national capabilities help to determine the timing of nationalizations is an idea implicit in the concept of obsolescing bargain. Initially, according to the concept, governments may offer attractive terms to induce foreign firms to make an investment, aware of their own inability to take the project on. But as domestic capabilities to perform complex tasks improve, host governments use their muscle to extract a growing share of the

investment's profits. Eventually host countries no longer feel any need to share profits with foreign investors and consider the strategy of owning the mining operations themselves.

The propensity to nationalize is growing over the course of time not only because governments see themselves as becoming more capable but also because they have increasing access to international markets that offer technology without equity strings. In addition, governments are finding it easier to mobilize the financial resources needed for the take-over and operation of state-owned enterprises."

• *Social goals.*
In this rationale it is argued that SMEs should promote broader social goals such as regional development, reduction of unemployment, more equitable income distribution, etc. The sizeable resource rents mineral exploitation generated in many countries, along with the alleged insensitivity of private foreign owners to a variety of social needs, were seen to provide strong justification for state ownership in the mineral sector (Gillis, 1980, p.18; Gillis, 1981, pp 1-2; Radetzki, 1985, p. 16; Berg, 1987, p. 7).

3. Characteristics of the goal structure of SMEs

The diverse list of reasons for the establishment of state ownership implies that the SMEs are generally mandated to pursue different goals and may be subject to different pressures than private mineral firms. In the literature there is a general consensus that the mandate of the state mineral sector reflects a multiplicity of national objectives (Osipov, 1974, p 87; Levy, pp 1-3; Sims, 1985, p 273; Cowan, 1985, p 49; Radetzki, 1985, pp 38-40; Ghose, 1983, p 107; Sahni, 1983, p 327; Gillis, 1982, pp 1-2). The SMEs are frequently called upon to pursue a mix of commercial and non-commercial objectives which can include such diverse goals as earning profits, redistributing income, promoting particular regions and sectors, earning foreign exchange, generating employment, reducing dependence on foreign capital, etc.

The multiple objectives of SMEs reflect their dual character: having on the one hand a public dimension expressed in public ownership, management and control and the furtherance of broader social interests, and an enterprise dimension which reflects the business character of the mining operations (Dobozi, 1983, p. 2).

It is commonly observed that these multiple and conflicting goals derive in many instances from the failure of government to clarify and rank the objectives of their SMEs. Existing conflicts and trade-offs among the different objectives usually have not been fully sorted out and the enterprises have not been given a clear sense of priorities (Cowan, 1985, p 38; Radetzki, 1985, p 38; Shirley, 1983, p 17).

4. Evaluation of the performance of SMEs

Vernon points out that measured against their purposes and against the alternative means of achieving those purposes, the SMEs may well score high marks (Vernon, 1982, p. 2). The widespread perception of SMEs is, however, that they are practically synonymous with inefficiency and financial losses and that they compare, in terms of efficiency, unfavourably with private mining firms (Trebat, 1983, pp 8, 176; Shirley, 1982, p 13; Gillis, 1982, p 2; Sims, 1985, p 268). Wälde claims that while some SMEs (eg, CODELCO, Malaysian Mining Corporation) have achieved competitive standards of performance, many others (eg, particularly COMIBOL) have become a permanent burden on the government's budget (Wälde, 1984, p. 32). Mikesell warns against broad generalizations in this regard (Mikesell, 1979, p 27):

Success stories and dismal failures may be found in enterprises run by both foreign direct investors and by governments, and there are cases where government mining enterprises appear to be guided by the same profit-maximizing criteria as many international mining firms.

The fact that SMEs in the developing countries are expected to pursue a multiplicity of goals (often without clearcut weights attached) makes their performance evaluation very difficult: low or negative profitability can be and often is justified by government. The basic question for performance evaluators is how to determine when low enterprise profitability or losses are justified and when they are due to managerial inefficiency (Mallon, 1981, p 1). A related question is how to get public enterprises to internalize social profitability criteria as decentralized guidelines for managerial decision-making. Sen, for example, sees no way of using profitability to evaluate and police the performance of public enterprises, even if profitability were adjusted to reflect social opportunity costs. He argues that the maximization of well-defined benefits at given accounting prices represents a rule which the managers can use as a guideline, but whether they are actually doing all in their power to maximize social benefits cannot be ascertained either by the public or the government merely by looking at their performance (Sen, 1970, p. 39).

Others are less pessimistic about social profitability as the criterion that government should use to evaluate and monitor the performance of its enterprises. It is argued that such multiple goals, at least ideally, can be consistent with the single objective of contributing as much as is feasible to national development or of maximizing the social rate of return on the nation's capital outlays for mineral activity (Radetzki, 1985, p. 46; Dobozi, 1982, pp 19-20; Mallon, 1981, pp 1-26; Jenkins, 1978; Gillis, 1980, p. 3; Mikesell, 1979, p. 39).

To demonstrate this point, regard the maximization of profits as a first rough approximation of the national benefit objective and consider the adjustments needed to make it a true measure of national benefit. Prices are often distorted in developing economies. The rationing of foreign exchange and unemployment suggest that the socially optimal, or shadow price, of foreign exchange is higher and the shadow wage for labor lower than actual market rates. Under such circumstances, the pursuit of national benefit will require that greater importance should be attached to earning foreign currency and to employment than when the goal pursued by the firm is simple profit maximization. The concern about creation of skills and technological proficiency, even beyond that motivated by profit maximization, is warranted by the positive externalities of these factors. The insistence on local inputs or domestic processing, even when privately unprofitable, may be a rational approach in the dynamic pursuit of national benefit in order to help establish a broad and diversified industrial base in the nation (Radetzki, 1985, p. 46).

A major problem is that the non-commercial benefits are exceedingly difficult to quantify due to such factors as distorted domestic prices, the intangible nature of some of these benefits. For instance, a Soviet study of developing country state-owned petroleum enterprises list among the benefits generated the following: employment creation, training of local personnel, promoting indigenous technological development, developing remote territories, preferential treatment of local suppliers, provision of locally produced petroleum products at low prices, etc. (Zaitsev, 1986, p. 116). A Polish assessment includes among the macro-benefits such highly aggregative phenomena as impact on general economic growth rate, global structural changes, smoothness of the business cycle, overall productivity (Szostak, 1982, p. 106).

Among the non-financial benefits some authors include such intangible and non-quantifiable factors as symbolic, political and emotional values that may justify financial costs. It is argued that national ownership can be a rallying point for the integration of often very centrifugal forces in developing countries. (According to Wälde, 1984a, p. 54).

A Soviet assessment even questions the usefulness of the category macroeconomic profitability if it cannot be expressed in exact quantitative terms (Osipov, 1974, p. 86).

Another Soviet expert criticizes the lack of progress in developing countries in the working out of a rational, integrated system of efficiency criteria and indicators for the state sector which would identify, in a differentiated manner, the socio-economic and financial aspects of state enterprise performance (Veitz, 1980, pp 19-30).

Distorted and controlled prices are commonly regarded as a major factor responsible for the fact that financial profitability is often a poor guide to social or macroeconomic profitability of SMEs (Osipov. 1974, p. 86; Trebat, 1983, p. 8; Sahni, 1983, p. 328; Smigol, Faminskiy and Kolesov, 1974, p. 73; Dobozi, 1982, p. 10; Rajkumar, 1982, p. 12).

One way to rectify distorted domestic prices is to use shadow prices for assessing SME results. It was shown that the results from shadow-price accounting can differ widely from conventional profits and losses. For example, in 1980-1981 the Egyptian non-ferrous metals sector showed a 15.5% financial rate of return, but the economic rate of return (based on shadow-price accounting) was negative. Thus it would be misleading to judge the given sector solely on the basis of its financial performance. However, the application of this method proved practically and politically difficult (Imam, 1980, p, 81; Shirley, 1983, p. 32). As Shirley (1983, p. 32) notes,

> ...shadow prices involve complicated calculations and are difficult to administer. Controversies can arise over any of the accounting ratios and it may prove impossible to judge a powerful SOE (State-Owned Enterprise) manager on the basis of such a debatable measure. The best solution is to move to market pricing and remove distortions wherever it is feasible, so that market prices accurately reflect economic prices.

With respect to the question of financial versus social profitability two distinct views seem to emerge (Dobozi, 1982, pp 16-17). The proponents of the first view emphasize that there is an essential dichotomy between the pursuit of financial profits and the pursuit of non-commercial goals. This view frequently leads to the conclusion that the acceptance of a variety of social goals would necessarily be at the cost of financial profitability and if and when a choice has to be made between the two sets of objectives, considerations of social policy remain supreme. The proponents of the other view take the stand that essentially there is no inherent conflict between the achievement of reasonable rates of financial profitability and the pursuit of non-commercial goals. Reference is made to empirical evidence in the developing countries which indicates that it is precisely those SMEs which are financially profitable, which have the strength, the will and the capacity to undertake the wider dimensions of social and macroeconomic obligation. Per contra it is argued that weak enterprises, inefficiently run and producing continuous financial losses, are unlikely to be effective agents of economic and social change (Rajkumar, 1982, p. 12).

Both views seem to contain seeds of truth. Certainly it would not be possible to take the stand that all SMEs engaged in non-commercial objectives must necessarily be financial disasters, but it would be too simplistic to assume that financially profitable

SMEs are necessarily socially oriented. There would certainly be cases where the conscious acceptance of some social obligations (eg, pricing below cost of production) would conflict with financial gains. The solution seems to lie in the validity and relevance of the assumed social or macroeconomic goals on the one hand, and the manner in which profits were made on the other (Report, 1981, p. 15).

5. Reasons for the inadequate performance of SMEs

Notwithstanding the above difficulties in evaluating SME performance, most analysts claim that the majority of these enterprises are characterized by low efficiency however measured. Though analysts in the market-economy countries deal particularly extensively with this aspect of SME behaviour, the literature in the socialist countries also seems to be increasingly concerned with state sector inefficiencies and their underlying factors (Sinai, 1979, p. 130; Csaki, 1986, p. 600; Smirnov, 1981, p. 105; UNITAR, 1982, pp 101-104; Veity, 1980, pp 29-31; Smigol, Faminskiy and Kolesov, 1974, pp 72-73; Dobozi, 1982, pp 6-30; Szostak, 1982, pp 106-107; Osipov, 1974, pp 84-86). The general message of the socialist literature is that SME inefficiencies — contrary to some Western perceptions — are not of inherent systemic nature and can be avoided with appropriate restructuring. The efficiency aspect receives growing attention in the developing country literature as well (Kumar, 1980, pp 46-51; Ghose, 1983, pp 112-113; El Malki, 1986, pp 116-121; Sahni, 1983, pp 328-334; Imam, 1980, pp 79-82; Trebat, 1983, p. 1980; Hagopian, 1986, pp 8-9).

5.1 Shortcomings related to the infancy of SMEs

It is suggested that through the 1960s and 1970s, the majority of SMEs in developing countries were in the inexperienced category and some of the performance shortcomings are a normal part of SME infancy. Both when existing private ventures were taken over or new state ventures set up, the operations usually had a difficult start (Radetzki, 1985, pp 58-63; Wälde, 1984, p. 32). For example, frequently the former owners were reluctant to provide managerial assistance and technology, especially when they were dissatisfied with the terms of nationalization. In this context some part of the socialist country literature points out the disruptive implications of sabotage on the part of the private multinational firms (Nosova, 1971. p. 65; Akademiya Nauk SSSR, 1974, pp 17-18; Stefanski, 1977, pp 119-120; Vinogradova, 1977, p. 100), partly as a consequence of voluntarist, ill-prepared acts of nationalization in some cases (Vinogradova, 1977, p. 100; Stefanski, 1977, pp 119-120). These start-up difficulties may be overcome as the SME matures, but the maturation period can be extended and characterized by substantial extra costs.

5.2 Complex goal structure: a potential way to conceal inefficiency

Where SMEs are expected to pursue both commercial and social goals and to answer to many different constituencies, their performance will suffer unless they are given a clear sense of priorities and the trade-offs among the goals are fully and clearly identified. In most instances competing goals are not tested for consistency, instead SMEs operate with considerable unresolved conflicts. It is claimed that, as a result, their performance cannot be measured against expectations, while losses can be too easily attributed to non-commercial goals, and poor management thereby concealed and pressure for remedial actions weakened (Sahirley, 1983, p. 17; Dobozi, 1982, p. 19; Radetzki, 1985, p. 40).

5.3 Weaknesses of external public control

It is suggested by some analysts that there is an unclear relationship between SME top managers and the owners (Radetzki, 1985, pp 38-40; Aharoni, 1981, p. 185; Shirley, 1983, p. 22; Mdaghri, 1981, pp 42-52). It is claimed that most governments have not found ways to control their SMEs without destroying their entrepreneurial nature (Cassese, 1981, pp 145-155). It is commonly understood that SME autonomy needs to be counter-balanced by some central control because state ownership per se will not ensure that SMEs always act in line with the broader public goals, even in the rare instances when these are clearly articulated by the government as owner. However, too much and poorly coordinated interference can make successful performance impossible (Wälde, 1984, p. 32; Shirley, 1983, p. 22). Frequently, blurring of managerial and supervisory functions takes place which may well infringe upon the basic principle of the autonomy of SMEs (Zakariya, 1980, p. 38; Alleyne, 1978, p. 39).

A recent case to demonstrate the damaging effects of excessive government interference on public enterprise performance is the ZCCM of Zambia. According to studies done by outside consultants in 1985, ZCCM is a viable enterprise if allocated the foreign exchange it requires to operate. Since the late 1970s the company has not been able to get the necessary foreign currency to operate efficiently, resulting in the deterioration of plant and machinery and higher operating costs. The government is said to be unable to give the company the foreign exchange that it needs (about 40% of earnings) due to the requirements of the rest of the economy (Jourdan, 1986, pp 18-19).

A major problem in many developing countries is related to the overly complex and bureaucratic structure of authority. The great variety of controlling government agencies may speak with many voices, and this fragmentation of authority to influence goals, policies, and managerial decisions often results in the transmittal of mixed and inconsistent signals to SME. A large SME may also be subject to pressures from legislative bodies and from a large number of potentially powerful special-interest groups that place demands on SME in the course of ordinary commercial transactions (Trebat, 1983, pp 73-74; Radetzki, 1985, pp 38-39; Levý, 1984, pp 4-5; Smigol, Faminskiy and Kolesov, 1974, p. 74). SMEs are often operated as public bureaucracies, with more attention to procedures than to results (World Bank, 1983, p. 50).

SMEs, especially if they are large, frequently are not insulated from partisan political pressures and sectionalism; they are usually strongly linked to the political process of their respective countries. Top managers are sometimes appointed as repayment for political debts, not for their knowledge of business or of the mineral sector concerned (Dobozi, 1982, pp 8-9; Cowan, 1985, p. 49; Imam, 1980, p. 76; Vernon, 1981, p. 102; Gillis, Jenkins and Lessard, 1982, p. 271).

Some analysts argue that while insufficient SME autonomy and over-bureaucratized central interference in setting objectives and in operative management decisions make successful enterprise performance very difficult or impossible, the absence of effective external controls often allows state mining enterprises to grow into powerful political and economic empires unrestrained by government control and public accountability (Wälde, 1984, p. 32; El Malki, 1986, p. 116; Mdaghri, 1981, p. 47; Abdalla, 1980, p. 23). Wälde argues that in many developing countries the top management of SME is stronger than the ministries which are supposed to supervise it (Wälde, 1984, p. 32). Mdaghri, for example, refers to the Cherifian Phosphate Board (OCP) as a state within the state whose public control has been ineffective (Mdaghri, 1981, p. 47).

5.4 Distorted and administered prices

As referred to earlier, the poor financial performance of some SMEs may, at least partly, be related to price controls implemented by the government for a variety of reasons. Pricing is one of the many important aspects of SME operations, and governments tend to look upon it as an instrument for achieving some broader public objectives. In actual practice, most SMEs are operating in a highly monopolistic or oligopolistic domestic market structure. Freed from the market forces of competition, they may tend to overcharge if left to themselves, and therefore intervention by the government may become necessary. The pricing policies of SMEs, flowing from policies decided upon by the government, may sometimes produce good commercial results, but more often tend to militate against them. It is frequently the case that SMEs do not receive adequate and timely compensation even if when losses can clearly be shown to be the result of underpricing policy imposed on SME by the government (International Workshop, 1980, pp 73-75; Dobozi, pp 9-10; Imam, 1980, p. 80; Boneo, 1986, p. 8).

5.5 Low pressure to minimize costs

It is argued that as a result of a number of factors — difficulties in measuring performance, blurred objectives, weak managerial accountability, non-competitive environment, governmental survival assurance, faulty incentive structure, managerial security of tenure, over-employment due to social considerations, easy access to capital on concessionary terms, etc. — many SMEs operate under soft budget constraints, which helps explain why pressures for cost-minimization may be weaker in SMEs than in private enterprises pursuing profit maximization (Gillis, 1980, p. 25; Gillis, 1982, p. 4; Radetzki, 1985, p. 40; Dobozi, 1981, p. 13). According to a Nigerian assessment, evidence on weak cost-consciousness abound in all the reports of enquiries on public corporations. Not even the top officials are sufficiently concerned with the financial repercussions of their daily activities and decisions, especially upon operating costs. Frequently, the attitude and actions of government authorities are a stumbling-block to the realization of the objective of cost reduction in SMEs. Instead of hearing about a query or an investigation in connection with why and how a loss occurred, and whose fault it was, the government agencies authorize the write-off of even relatively colossal amount of public funds. The result is that the tendency for incurring losses in public enterprises is inadvertently given a fillip, and the weak cost-consciousness of the functionaries of these enterprises is condoned (Nwosu, 1975, pp 11-20).

5.6 Overinvestment in capacity

This follows from the low cost of capital and also from the bureaucratic tendency of SME management to maximize the volume of operations rather than profits (Radetzki, 1985, p. 42). Many SMEs regard government equity as simply a form of free finance, since it is rare that any servicing in the form of dividends is required (UNIDO, 1984, p. 27; Smirnov, 1981, p. 105; Gillis, 1982, p. 12; Gillis, Jenkins and Lessard, 1982, p. 267). SMEs generally face softer tax burden than comparable private firms. It is claimed that it can be difficult for the Treasury to obtain funds from even the profitable SMEs as they — due to their expansion drive — prefer to reinvest it (Sims, 1985, p. 278). Various borrowing privileges also make capital relatively cheap for SMEs. Easy access to foreign capital in the last decade is seen as instrumental in overfinancing capacity expansions as the extensive involvement of a variety of public organizations (recipient government, SMEs, national export financing agencies, international financial institutions) tended to reduced the banker's concern about commercial viability (Wälde, 1984, p. 29; Trebat, 1983, p. 233).

It is claimed that these soft financial constraints tend to make SMEs ready to take on more marginal projects than would be acceptable under strict commercial test (Wälde, 1984, p. 28).It is further suggested that SMEs, because of their predominantly domestic orientation, favour domestic investment, even if foreign investment may make more economic sense, thus contributing to an international division of labour which is heavily weighted towards increases of domestic capacities with little regard for market demand and marketing possibilities (Wälde, 1984, p. 29).

6. The world market impact of the expansion of SMEs

The fact that SMEs have become an important factor in world mineral supply, understandably generated considerable interest in finding out about their actual or potential market impact (Radetzki, 1985, pp 63-65, 141-146; Vernon, 1971, p. 62; Vernon and Wells, Jr., 1986, p. 27; Sims, 1985, pp 273-277; Stobart, 1984, pp 175-187; Powers, 1981; Cordes, 1983, p. 26; Wälde, 1984a, p. 54; Nunnenkamp, 1986, p. 188, Dobozi, 1983, pp 9-10; Mikesell, 1979, p. 40; Thoburn, 1981).

In the so far most systematic study on SME market impact, Radetzki (1985, pp 141-146) formulated five hypotheses and presented an informal and basically qualitative test of them on the basis of case studies for three developing country SMEs, namely PT Timah (tin, Indonesia), Ferrominera (iron ore, Venezuela), and ZCCM (copper, Zambia).

(i) The establishment of SMEs has temporarily led to lower output level and higher costs (due to extra start-up and learning costs) and prices then would have prevailed with the old ownership patterns. According to the case studies, nationalization was followed by an initial period of lower efficiency, higher costs and an inability to operate at full capacity or to establish new capacity. This finding is supported by other analysts as well (Thoburn, 1981; Nosova, 1971, p. 65; Akademiya Nauk SSSR, 1974, pp 17-18; Stefanski, 1977, pp 119-120; Vinogradova, 1977, p. 100).

(ii) Production costs in mature SMEs will be permanently higher than in private mineral firms under similar circumstances because of the additional costs SMEs incur in their pursuit of non-profit objectives and because they are generally under less pressure to minimize costs. The limited systematic empirical evidence does support the hypothesis that production costs have been raised by the pursuit of multiple objectives, but there is no clear evidence of higher costs due to permanent managerial inefficiency. In the Western world copper industry there is some evidence that in 1980 the average cash breakeven cost of the state-owned mines was nearly one-third higher than the industry average, mainly because the "tail" of the state-controlled sector had very high costs. As Crowson suggests, mines in this "tail" are kept in production for national economic or strategic reasons (Crowson, 1982, p. 7).

(iii) The increasing importance of SMEs will result in greater medium-term price instability in the world mineral markets because they are less flexible in adjusting capacity utilization to cyclical variations in demand. The direct evidence from the case studies in support of the hypothesis is inconclusive or weak. However, the dominant perception among Western experts is that SMEs are characterized by greater inflexibility than private mining firms in capacity utilization over the business cycle. It is argued that developing country SMEs generally are under considerable government pressure to maintain or even increase production during recession and depressed market prices in order to sustain foreign exchange and employment. It is claimed, for example, that SMEs tend to continue producing minerals even in a situation of losses, at least as long as production generates net foreign exchange benefits, and thereby they may contribute to the over-supply of an already over-supplied minerals market and hence to a further weakening of market prices (Wälde, 1984a, p. 55; Perlman and Gilbert, 1987, p. 6).

Stobart presents empirical evidence for some metals that during the recession in the early 1980s a disproportionately high percentage of the production cutbacks occurred in privately owned mining companies. He adds, however, that as of recently the inflexibility of production affects all relatively large or new operations, regardless of their ownership. Once large productive capacity exists, there are considerable pressures even for the private actors to keep it in operation due to the very high ratio of fixed to variable costs. The most onerous and newest of fixed costs is the servicing of debt (Stobart, 1984, p. 265; Fortin, 1987, p. 170). Due to the typically very low share of variable costs, once on stream, it takes a very large movement in the price to justify a small change in production levels (Vernon, 1982, p. 5). The production inflexibility due to high fixed-to-variable cost ratio can be particularly considerable if some typical variable costs (eg, labour) prove to be fixed when the social rate of return rather than commercial profit is the SME's objective. For example, if there is substantial unemployed labour, the social opportunity cost of employing the labourers, who might otherwise be a burden on the state, would be less than the monetary cost (Mikesell, 1979, p. 38; Radetzki, 1985, p. 48). Furthermore, when SMEs are engaged in the processing of a domestic material, the cost structure of the firm is influenced by another important factor. As Vernon notes, in such cases, the processing facility is typically allowed to acquire its raw material at less than the export price to foreigners; accordingly variable costs are even further reduced in importance (Vernon, 1982, p. 23):

The upshot is that state-owned enterprises characteristically see their variable costs as much lower than do the private enterprises that they displace. This is not to say that the managers of state-owned enterprises necessarily have an easier task than private managers. But it does mean that financial incentive to adjust production levels to demand is blunted, and that the possibility of generating indigestible surpluses through overproduction is accordingly high.

(iv) The emergence of SMEs has permanently reduced the extent of vertical integration in the mineral industry thus substantially broadening and stabilizing some formerly thin arms-length markets and thereby contributing to price stability in the noncaptive trade. There is some evidence from the three case studies by Radetzki that the growth of SMEs has reduced vertical integration in world mineral markets and increased noncaptive trade. The case-study material was not sufficient for testing the supposed increase of price stability in arms-length markets.

Many other studies provide empirical evidence (especially for oil, iron ore and bauxite) about the reduced extent of vertical integration across national borders and the formation of relatively more competitive international market structures as a result of increased number of SMEs. It is suggested that this has led to reduced sector stability and discipline as well as less producer control of prices (Vernon and Levy, 1982, pp 184-186; Vernon, 1982, p. 13; Vernon, 1971, pp 43-45; Cordes, 1983, p. 26; Dobozi, 1977, pp 35-39; Moran, 1974, p. 30; Jacoby, 1974, p. 201). It is claimed, for instance, that the aluminium sector has become more fragmented and price leadership has been weakened significantly. The six largest vertically integrated multinational companies which dominated the aluminium industry two decades ago have changed from price makers via the Alcan list price to price takers on the LME or COMEX terminal markets (Carnegie, 1985, p. 9). Among the various mining industries only iron ore mining showed a tendency to reestablish its earlier pre-nationalization levels of corporate concentration, as measured by the standard Herfindahl index (Vernon, 1983, p. 49; Vernon, 1981, p. 104).

With regard to developing country SME moves to establish their own vertically integrated structure Wälde notes that only few of them have been able to become fully self-sufficient in the conduct of exploration, production, finance and marketing operations, such as CVRD of Brazil, CODELCO of Chile, Pernas of Malaysia, the *Office Cherifien des Phosphates of Morocco* (OCPM) or SONAREM of Algeria (Wälde, 1981, p. 27).

Vernon and Wells, Jr. suggest that mature state-owned enterprises in developing countries, in their search for stability and control, face several possibilities to establish organizational link with processing and distributing in foreign countries (Vernon and Wells, Jr., 1986, p. 27).

One possibility is that the independent SMEs will fall into difficulties whenever their products are in easy supply. As suppliers of last resort, they may find their sales falling more rapidly than sales of their vertically integrated private competitors. Although such SMEs may be tempted to cut their prices in order to redress the balance, they will do so reluctantly, aware that such a strategy will lead to an industry-wide round of reductions, wiping out profits and leaving market shares unchanged.

Another possibility is that some of the state-owned enterprises will become multinational enterprises, complete with their own processing and distributing facilities in the countries where the output is marketed. For instance, this pattern was followed by the Kuwait Oil Company in acquiring distribution facilities in the United States. Zambia acquired a 50% interest in a French casting rod plant, creating an outlet for some of its copper. CODELCO, the Chilean state-owned copper enterprise, acquired a 40% interest in a West German copper fabricating plant. It is suggested by Vernon that the urge of SMEs to acquire downstream processing facilities abroad may have been enhanced in some cases by the realization that some of the foreign producers whom they had dispossessed by nationalization were developing their own new sources of raw materials (Vernon, 1982, p. 19).

A third possibility is that some new type of organic link will be forged between the large-scale, capital intensive units and their related downstream facilities in foreign markets, a link that will not involve common ownership yet will still allow for the application of unitary strategies that cover the whole vertical system. Petrobras of Brazil, for example, has entered into various arrangements of this sort with state-owned oil companies abroad. Indeed, in the cases of oil sales by Venezuela and Saudi Arabia, it has been an official policy to discriminate in favour of state-owned buyers at the expense of private buyers, presumably in the hope of developing more durable arrangements (Vernon, 1982, p. 18).

Despite the above possibilities, the SMEs have not found a formula that greatly reduces the uncertainties that hang over the raw material industries. As Vernon concludes (1982, p. 21),

...the disconcerting possibility is that certain inherent characteristics of state-owned enterprises will prevent them in the end from developing arrangements that offer any increased sense of security.

(v) The emergence of SMEs is not a threat to the survival of private multinational mineral companies. The case studies seem to confirm this hypothesis. It is claimed that both SMEs and private mineral firms may sometimes exhibit very aggressive market expansion behaviour. Permanent subsidies to the state sector are unlikely and there is no firm indication that SMEs exhibit greater investment propensity than private mining firms (Radetzki, 1985, pp 65, 144).

The opposite concern is based on the perception that SMEs' tendency toward excessive capacity expansion and uneconomic operation at full capacity, made possible, inter alia, by the soft budget constraints and concessional financing, pose a long-term threat to the existence of private mining firms (Chemical Bank, 1981; Economist Intelligence Unit, 1983; American Mining Congress, 1978). Such a concern has been especially strongly voiced in recent years by the North American copper producers who fear for their commercial viability due to "unfair" competition from state-owned copper producers in developing countries.

A final question to be considered in the context of the world market impact of SMEs is whether the emergence of the latter is likely to lead to the establishment of such restrictive type international arrangements as producer cartels. Opinions are divided on this issue. Labys points out that the possibilities for producer (and consumer) cartels can be increased, since public enterprises are better suited to enter into restrictive types of international commodity agreements (Labys, 1986, p. 4).

According to a contrasting view, the existence of state-owned enterprises is more likely to constitute an impediment to effective producer cartels than otherwise. This is explained by the fact that the various state-owned enterprises involved in the world market operate from strikingly different perspectives, pursuing a much more diverse set of goals than would be the case for a group of profit-seeking private firms in an oligopolistic industry. It is claimed that in general market participants who are motivated by diverse goals find it more difficult to coordinate their efforts than those with common goals (Vernon and Levy, 1982, p. 185; Vernon, 1981, pp 101, 106; Newman, 1978).

7. Policy options for improving SME performance

The growing concern over the performance of SMEs has resulted in a number of proposals to increase their efficiency. Some of the more important are as follows.

Setting clear-cut and attainable objectives. The costs of non-commercial constraints placed on SMEs should be calculated and weighed against the benefits to society (Shirley, 1983, p. 69; Sahni, 1983, p. 331). It is essential that SMEs be explicit about the multiplicity of the goals being pursued by their various activities. It may be desirable to apply goal programming which is a quantitative technique usable in multi-objective enterprise decision-making. Its applicability has been effectively demonstrated. There are six steps involved viz., (i) the identification of the development goals, (ii) an evaluation of the means to achieve the said goals, (iii) assigning of weights to the various goals in conformity with some politically specified order of preference, (iv) the assignment of weights to the over- or underachievement of relevant targets, (v) discerning the optimal investment portfolio, and (vi) the simulation of the impacts over time on selected objectives, eg, national income, employment, distribution of income, foreign exchange earning, etc. (Sfeir-Younis and Bromley, 1977).

Once non-commercial constraints have been identified and costed, governments can instruct SMEs to maximize their profits, taking into account other objectives that reduce profits by reimbursing the companies or lowering their profit targets. It is important that SMEs be compensated explicitly for the social services they are obliged to provide. After compensation, enterprises could then legitimately be held accountable for achieving profit targets (Mallen, 1981, p. 242; Shirley, 1983, p. 69; Osipov, 1974, p. 96; Dobozi, 1982, pp 28-29; Cassese, 1981, p. 15). It is suggested, for example, that if a SME is required to assume responsibilities it would not undertake on the basis of its commercial interests, it should be reimbursed on the basis of specific service contracts concluded between the government and the SMEs (Wälde, 1984, p. 33; Shirley, 1983, p. 70; Mallen, 1981, p. 25).

The aim of pricing policies should be to prevent exploitation of monopoly positions, profiteering and other undesirable practices, and at the same time to allow reasonable returns on investment to the SMEs calculated on normative assumptions of efficiency. Where there are price distortions, shadow pricing procedures can be used to evaluate SME performance consistent with economic efficiency. Shadow prices can be complex to calculate and administer, so the best solution is to move market prices closer to them by removing distortions whenever feasible (Report, 1981, pp 46-47; Shirley, 1983, pp 32, 70; Sahni, 1983, p. 334).

Managerial ability is a prerequisite for the performance improvement of SMEs. Effective efficiency pressure depends on how closely managerial rewards can be linked to managerial efforts to maximize efficiency. Compensation and training should be geared to create a corps of competent SME managers with appropriate skills (Dobozi, 1982, p. 25; Shirley, 1984, p. 70). Less security of management tenure, a performance-oriented career system, a constant rotation of top and specialized management and insulation of negative outside influences such as political patronage are proposed to achieve better performance (Wälde, 1984a, p. 55).

Strengthening the operational autonomy of SMEs by reducing excessive government interference. Relations between the government (and its various agencies) and the SMEs (in administrative, technical, financial and other areas) should be defined more clearly. Clearer legal statues would have to be drafted for the various public agencies, with their aims and operational mandates unequivocally stated. It is suggested that the same ground rules should be established for SMEs as for private firms. SMEs should accordingly be subject to full disclosure requirements concerning their performance, and full accountability to the owners. This would involve, inter alia, having them operate under the Companies Act rather than their own Act. Removing SMEs from the domestic political arena is deemed desirable by most of the analysts (El Malki, 1986, p. 121; Imam, 1980, p. 79; Wälde, 1984, p. 32; Sims, 1985, p. 278; Trebat, 1983, p. 83).

Strong public efforts are necessary to ascertain that SME investments are initiated with adequate marketing and cost surveys. It has been proposed that SMEs must be educated to understand that their investment decisions may have an effect on world mineral markets, and thus on the price and profitability of their own output (Stobart, 1984, p. 265; Trebat, 1983, pp 81-82; Cowan, 1985, p. 48).

Some analysts suggest that government equity in large mining projects has only few unique advantages in achieving the diverse objectives of government. Regulation, including taxation, of private firms is usually an adequate, if not superior, tool. It has been suggested that when contemplating an equity share, governments should clarify their objectives, seek to understand why the existing regulatory framework is not sufficient to achieve them, and ask whether the costs and efforts required to realize the advantage of an equity stake are simpler than improving the regulatory framework for private mining activities and relying on modern contractual forms (Sims, 1985, p. 280). The managerial and fiscal burden of permanently inefficient SMEs is thought to be reduced by liquidating nonviable units or by the divestment to the private sector of failing SMEs (Report, 1981, p. 49; Shirley, 1982, p. 70; Cowan, 1985, p. 48; Sims, 1985, p. 280).

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