Brazilian mining code: A mineral economics focus

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The revision of the Brazilian Mining Code has introduced some important changes in the mining legal framework, becoming effective after January 1997.[1] From an international viewpoint, the most acclaimed change is that there is no longer any distinction between a Brazilian company and a Brazilian company of national capital which, in fact, after 1988 had precluded foreign investors from controlling mining operations. However, other "relatively minor" adjustments may have, in the medium term, a significant impact on the sector's attractiveness matrix, especially when focused from the Brazilian private sector interests.

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The objective of this article is *to analyze selected changes* recently contemplated by the revision of the Brazilian Mining Code from a mineral economics point of view. Except for one of these changes, the others specifically focus on exploration issues not addressing concession aspects.

The fundamentals of the Brazilian Mining Code, currently in force in Brazil, in terms of principles and operating guidelines, were originally established in 1967. For a long period, although several amendments had been made, reasonably good common sense had prevailed regarding the mining code, only requiring some specific and localized adjustments.

At that time, when viewed from certain angles it could even be classified as advanced in relation to the Third World context. In general, the problems and disorder that had arisen should perhaps be traced more to administrative, political and/or capital and qualified human resource availability constraints, preventing government authorities from fulfilling their tasks, rather than to an explicit need for a more in-depth legal revision.

In the 1980s, although on a par with the new challenges confronting the mining industry[2] and new responses and approaches being demanded from the government authorities, several problems have already been detected and added to a mineral agenda for future revision. During the 1990s, in the wake of the worldwide revision of international mining codes and given the new situation where private companies were to play a prominent role, the Brazilian mining community became aware of the need and opportunity to perform a comprehensive reform committed to making the Brazilian mining industry more attractive to foreign investors. In these terms, the revision was undertaken to solve old problems and adapt the laws to a new business environment consisting, to a large extent, of another set of objectives, priorities and challenges.

The article concentrates on specific legal issues selected from the revised legal framework, but which offer a follow-up cross-section evaluation from a mineral economics perspective. In fact, we believe that the impacts arising from this revision are pending evaluation in economic terms, though a deeper appreciation of their overall importance will probably require several years of observation. Moreover, by adopting a liberal stand again towards foreign mining company operations, it is expected that, in the medium run, other adjustments are going to represent a major factor in the upgrade of the mining sector's attractiveness to Brazilian mining companies, specially the small to medium-sized industrial mining operations. On the other hand, for larger operations, in the case of the production of non-tradable minerals and sectors which already have a competitive international edge, the downstream industry-related activities will receive comprehensive stimulus to backward integration.

The article also comments on the latent derived demand in terms of mineral economics capabilities – *expertise and availability of strategic information* – and some new legal issues will force the government to exercise a larger portion of discretionary power.

In conclusion, on the whole, some important features, such as concession limit and resources and reserves concept, usually considered when analyzing mining legal frameworks, are reviewed but are not included in the Brazilian Mining Code revision. With this referential in mind we now address the highlights of the reform.

Highlights of the reform

In a general and concise statement in order to shed some light on the added value caused by the review and modernization of the Brazilian Mining Code, we have chosen to look at six important vectors of change as the fundamental outlines from the reform; foreign control, fee for exploration permits, mining company special permit (MCSP), limitless exploration claims, mining limit concepts, and negotiation of exploration rights.

Foreign control – Taking into account the flow of foreign mining investments accruing to Latin America, probably the most important legal amendment was made at the Constitutional level when returning the permission granted to foreign capital to assume the control of mining operations. After 1988 the new Federal Constitution expressly granted the exclusive right to Brazilian companies of national capital and Brazilian citizens to explore and exploit mineral resources, making a distinction from the Brazilian company concept that embraces the possibility to be controlled by foreign capital. With the Federal Constitutional Amendment No. 6 issued on August 15, and becoming effective in January 1997 this dual approach is no longer applicable and in general Brazil is at the same level as its neighbors.

For an emerging country with an extensive territory and severe lack of risk capital this discrimination against foreign investors was somewhat like a *kamikaze* policy. At the margin this opportunity cost imposed on the Brazilian society can be inferred at first glance by: less geological information being available, less exploration and exploitation business opportunities offered and less investments all along the industrial chain.

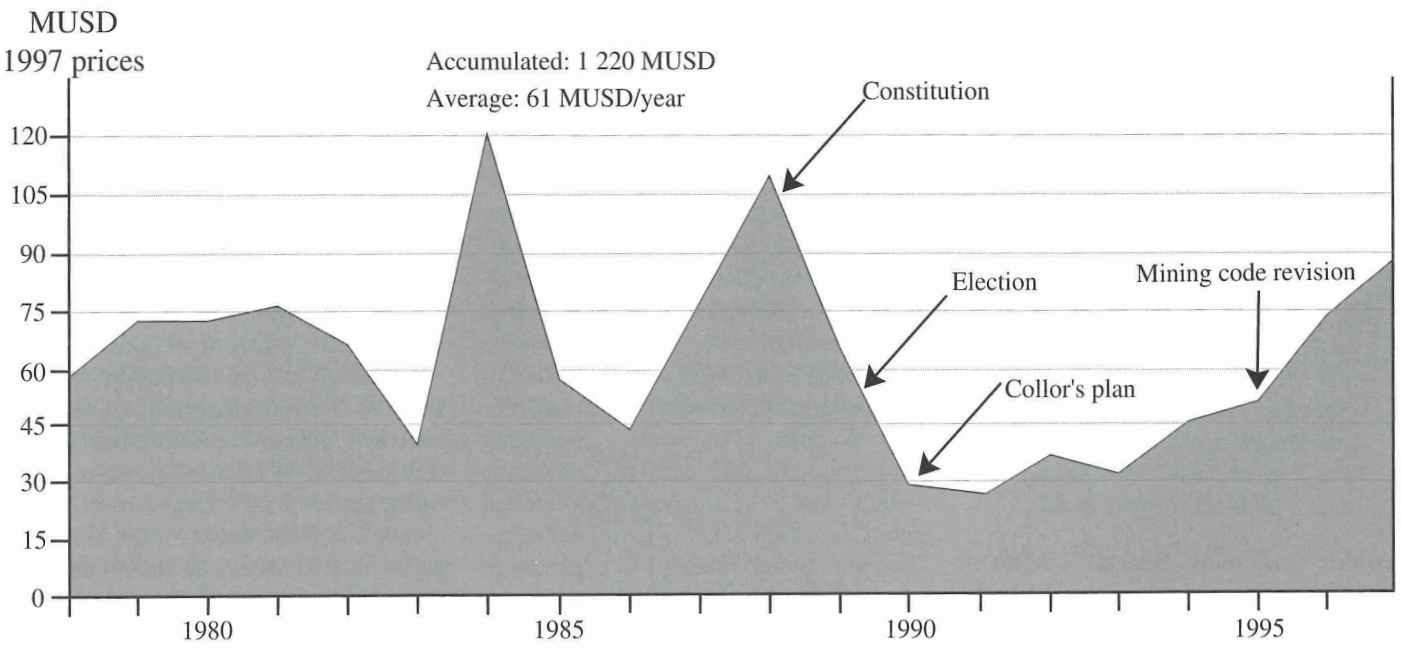
Excluding the influence of the recessional economic climate during the 1988-1996 period, a major exit of foreign companies was observed with a strong downturn in the level of exploration investments. A comprehensive example is the behavior of gold exploration. During the 1978-1997 period about MUSD 1 200 was invested in gold exploration representing an annual average investment of MUSD 61 (Figure 1).[3]

In this period about 70 per cent of the total amount was concentrated in the first eleven years (1978-1989). After 1988 the downturn in the curve reflecting the decline in the Brazilian mining investment climate is quite evident. After 1991, with the significant flow of investments being directed towards Latin America, a consistent reversal leveraged by the revision on the Brazilian Mining Code in 1995, which pointed to a speedy recovery to the higher levels observed in the past.

Fee for exploration permits – In the past, this fee was charged for exploration permits, but was suspended in 1992 without any apparent logical reason. Its reintroduction intends to charge additional costs on speculation concerning larger tracts of attractively minable areas, and offers as a side benefit an incentive to adopt a more dynamic stand in carrying out exploratory work. The fee consists of a fixed component sum of approximately USD 250 charged upon application and a variable fee, to be charged on an annual basis, of USD 1.00 per hectare of exploration permits in the first three years, and USD 1.50 after this initial period.

Nowadays, excluding some special regions such as national borders and environmental reserves, Brazil's territory is literally covered by exploration claims and permits. To a large extent, we can correlate this situation to the free access *status* to exploration lands that was facilitated in the past. As an example, several companies in the North and Mid-West

Figure 1. Investments in Brazilian gold exploration



Source: Vale (1998a).

regions have been blocking off large tracts of land, *in certain cases covering million of hectares*, under an exploration permit *status*. In addition to represent a potential venue of high economic cost generation this behavior has been exerting tremendous pressure on the old-fashioned structure of government administrative services.

Under the new rules, the *financial opportunity cost* to the company investing in such a policy *can even be expressed in terms of real options and exploration and mining agreement opportunities foregone*. On the other hand, from the society's point of view the charge of a fee on exploration permits offers the following potential benefits:

- enforces the adjustment of demand of private companies on mining lands to their real and effective interest, considering the amount of their exploration budgets and the size and expertise of their exploration team;
- by introducing a significant variable cost component in the exploration function of mining company this pressures for more selectivity in requesting exploration permits and objectivity and efficiency in running the exploratory campaign[4];
- inhibits (at least conceptually) the concentration and speculation on mining rights and postpones development as a way of building up strategic reserves, making access more democratic and thus, more available to medium and small entrepreneurs; and
- helps to finance the public costs associated with setting up, maintaining and operating the sophisticated computerized infrastructure required to manage the country's exploration activity in the new millennium over such a large territory as Brazil.

Mining Company Special Permit – MCSP – one important change included in the revised Brazilian Mining Code is that a specific authorization is no longer required to operate as a mining company. In the past, this legal issue and the necessary paperwork, costs and constraints involved contributed to erode the attractiveness of the mining sector as an investment opportunity. In addition to structural lack of risk venture capital observed in emerging countries, so much worse when considering the exploration stage, it is worth mentioning that historically part of the weakness of the Brazilian private mining segment can be traced to the low level of vertical integration between the industrial sectors with the extractive segments positioned upstream. From the Brazilian society point of view, it is a fundamental concern on its behalf to preclude policies that reinforce the natural enclave bias observed in the mining industry in emerging countries.

From the private sector point of view the above mentioned authorization was specially detrimental to Brazilian groups potentially interested in diversifying their operations or even pursuing forward and backward integration, but without a proper consolidated *mine-business* culture. Amongst the alternatives to surpass this imposition entailed a not so simple and a low cost re-engineering process of partnerships started within the groups, as a route to evade the side effects of subjecting the holdings to additional legal constraints or the preferable way of giving rise to a specific mining company. Whatever the case, depending on the size and sector of the group and level of capital market exposure, the adjustment process was considered to be especially unattractive when confronted with other alternatives of investment in the economy.

On exploration this problem was more acute and conspicuous because usually it implied creation of an affiliated exploration company but without operating properties. In this case the operation would have to be financed with internal funds, but without being permitted to deduct the amount invested as expenses in the income tax calculation *since the holding was not a mining company*. So, the unique and less desirable route was to carry over exploration expenses as deferred investments to be amortized or written-off as a loss in the future. This aspect was financially cumbersome when we consider the historically acute inflationary process and the limited index to monetary correction permitted. These factors, the *scarce mine-business culture*, and the mining sector's relative unattractiveness to Brazilian private companies, have contributed to discouraging the flow of long term national private investment in Brazilian mining.

In principle, it is normal in developing countries that, in a maze of complicated rules and regulations, although there are always alternatives to reach a compromise in interests, a lot of energy, time and cost is spent to get anywhere. In this sense the MCSP was an additional and superfluous constraint to exploration and exploitation having only contributed to increase the natural challenges and cost, discouraging the flow of long term national private investment in Brazilian mining industry.

An important byproduct from this new attitude is concerned with the legal feasibility of offering mining rights as a guarantee to funding a mining project. During the years, especially for small and medium sized Brazilian companies, this lack of flexibility represented a particular lack of incentive. Bearing in mind the traditional scarcity of funds available for mineral exploration, these companies, after being successful in the discovery and outlining stages basically using their own internal funds, were in no condition to approach the capital market offering their mining rights as a guarantee.

Under the former legal framework *the financial institution also had to be registered as a mining company* to properly execute this asset in case of a debt execution process. In spite of the influence of other factors obstructing a more widespread use of the market value of mining rights as a fund-raising instrument, the removal of this constraint is a notable and significant step toward this objective, paving the way to integration with foreign mining capital markets in the future.

Limitless exploration claims – the former legal order that limited the maximum number of exploration permits per mineral to 5 (five) has finally been eliminated. Probably its insertion in the legal framework some decades ago was defended as precluding a higher economic concentration. After so many years, on the basis of ample consensus on its ineffectiveness in fulfilling that task and pressured by the notorious public and private administration problems and costs from the proliferation of countless *paper mining companies* created solely to bypass this law, the Brazilian mining sector was allowed to operate without this constraint.

Mining limit concepts – this issue was the unique relevant feature about exploitation conditions (concession) revised by the new Mining Code. The change introduced in the mining limit referential encompassing the possibility of setting a horizontal mine limit separate from the usual vertical one, to include underground mineralized zones, has made it conceptually feasible to establish concomitant development activities addressing diverse deposits and/or mineralized zones occurring at the same site[5]. We expect that the application of this rule, after an experimental period of adaptation and to accommodate some untested and/or subjective operating guidelines, will reveal interesting investment opportunities to the small and medium scale mining segment.

Negotiation of exploration rights – the revision introduced more flexibility to negotiating exploration rights. In the past, the formal transfer was permitted after the approval of the exploration report alone. Consequently, an informal market – perhaps black market is more appropriate – was observed, with the associated costs in terms of taxation evasion and lack of information.

With the revision, based on the *disclosure and secured related benefits accruing* we can expect a general increase in the liquidity level of the transaction market of exploration properties contributing to revive the capital allocation process at a stage crucial to the mineral supply. This aspect is so much more relevant when considering the affluent presence of foreign entrepreneurs in a climate of investments characterized by scarcity of new (free) areas to be claimed and much speculation. Table 1 summarizes some of the main benefits of the reform.

Final remarks

In general, the revision of the Mining Code introduced some important changes to the legal framework of the Brazilian mining industry operation, although some of these will demand a lag time before they could be evaluated in operational ground at all. A comprehensive analysis of all pertinent legal changes would mean an exhaustive review of countless issues beyond the scope defined. In this context, the aspects addressed in this overview, although very important, are only part of the Revision and were selected considering a stronger interface with the mineral economics focus of interest and foreign investor perspective.

Concerning the impact to foreign mining company directional policy matrix, besides the permission to hold majority control in mining operations – unquestionably the most relevant benefit – the rest are associated with the increase flexibility to farm in and farm out prospects and projects, and the reduction of paper work and bureaucracy. Charging a fee for exploration permits, although a cost to the companies already installed, can be interpreted positively from the latecomers trying to hold interests in Brazil and facing scarcity of areas for exploration.

In spite of the aforementioned favorable changes, the government has lost a good opportunity to discipline the *Geological Reconnaissance – GR* by including more flexibility on the interface with interests of major companies, the sole potential players with the proper budget and expertise to eventually make use of this instrument. Although it has been contemplated in the Brazilian Mining Code for a long time it was ignored and underestimated in its effective importance to overcome the lack of geological information, having passed through the recent Mining Code Revision intact. However, despite its old hibernation state we share the conviction that with some minor adjustments it can fulfill an important role as a mineral policy shortcut.[6]

Unquestionably the level of knowledge of the geological endowment represents one of the most critical constraints to support the sustainable development of the mining industry, and in an emerging country with continental territory like Brazil it is a real challenge to be solved. Taking into account the relatively small extension of areas mapped in a minimum acceptable scale from the private sector point of view it is fundamental to identify courses of actions in mineral policy practice that leverage the Brazilian climate of investments by speeding up the availability of geological information, offering more clarity to the decision process of mining companies, and as a consequence reducing the risk on exploration investments, but respecting the highest national priorities and interests.

Just to illustrate, the total area with basic geological mapping on a 1:100 000

Table 1. Benefits of the reform

- Stability of rules;
- Fast and flexible administrative procedures;
- Discouraging speculation;
- Reassurance of old principles already incorporated in the legislation;
- More discretionary power;
- Less bureaucracy; and
- Prominent role to be played by the private sector.

scale represents only 10 per cent of the national territory.[7] Moreover, even considering that 50 per cent of the 160 fundamental known areas of mining activity have already been mapped on this scale, a large part of these works are too old and so must be reinterpreted, not to mention that this level of detail could be qualified as reasonable at most when compared with the format and detail of the information demanded by the exploration decision process of a mining company. On the other hand, for important gold mining districts in the Amazon region the geological mapping available is on scale 1:1 000 000 and based on work done in 1970's.[8]

Nowadays, the special exploration permit status based on GR, and which may be considered as belonging to the regional prospecting stage, sets a total area of 12 000 km^2 and a time frame of only three months for the company before it decides to abandon or to concentrate on selected portions of the area for more detailed work – the exploration stage. In fact, this inappropriate time frame precludes any serious and more in-depth survey of the area. In general, even abstracting the specific difficulties relating to location (the Amazon region, for example) this inappropriate time precludes and/or inhibits an airborne survey of the area, not to mention follow up ground works. This is another limitation since only geophysical airborne survey methods are allowed.

Considering the country's enormous territory, with unsatisfactory geological information over large primary minable tracts of land and the latent interest of some major companies focused on gold and base metals, their expertise and more robust exploration budgets, we can envisage a kind of mining agreement that could be used to accelerate the country's geological level of information, combining two fundamental vectors of mining policy: *the interest of society in the interest, expertise and investment capacity of major mining companies*. The potential for cooperation is ample and supported by a robust synergy of objectives in order to increase the availability of geological information and the generation of business opportunities to exploration and exploitation.

The proposal permits that a mining company can claim an expressive area under the GR status subjecting it to the following conditions:

- a more satisfactory period to conduct prospecting work, at least 1 year;
- maintaining the suspension of the annual fee charged for exploration permits (already granted to GR);
- the priority to select the areas to be claimed for exploration projects; and
- respecting third party interests, the possibility to eventually conduct follow up works. The increasing integration between several geophysical and geochemical methods and techniques suggest this as the better approach.

Taking into consideration the stringent decision yardsticks used by major companies in evaluating the economics of exploration prospects – *minimum size condition*, for example – the possibility to claim large areas, working in the interface of prospection with exploration, within an adequate time frame, without taxation and with secured priority rights over areas to be selected can be considered very attractive, especially by companies whose exploration function embraces strategies focusing on more intensive prospecting campaigns. From the society point of view this policy could generate the following potential benefits:

- represent an interesting prospect to increase the inflow of direct foreign investments;
- increase the level of detail, scope and quality of the country's geological information, especially in certain regions with sparse geological data; and
- speed up the availability of information required in the exploration stage by further attracting the smaller companies to follow up work in the areas discarded by the major companies.

It must be admitted that there is concern that GR permission eventually could be used as a way to cover speculation interests, such as blocking the development of mineral resources, for example. However, if a predefined set of conditions and objectives have been met in terms of adequate regulation, monitoring and enforcement by the government we do not see any real problem.

Comparing with the mining law of some other emerging countries, experts could be tempted to question the fact that the Brazilian Mining Code does not establish a time frame specifying the duration of the concession. Well, it is true it does not have this limitation associated with time, but does include the conditions that must be fulfilled to guarantee the concession. So, in theory the mining company can operate until the complete depletion of the deposit, as long as it respects these conditions, the Mining Development Plan for the Deposit – MDPD being fundamental.

The companies must adhere to the MDPD approved at the feasibility stage and any alteration thereafter should be submitted to examination by the government. The company is able at any time to revise its plan in order to pursue higher levels of productivity and upgrade the economics of its operation, but it is subject to government approval. Conceptually the government has all the power and instruments to monitor the operation and guarantee at any time the compliance with and adoption of the operational guidelines precluding the adoption of bad practices, such as selective mining, for example. Under this regime any potential disarray could be traced much more to the eventual inefficiency of the government to exercise its authority than to the regime itself.

This feature has been included in the Brazilian mining law for a long time and in the past few decades, no problem has been noticed from the society or the com

panies point of view. In a context of increasing globalization we believe it represents an asset by way of stability of rules when comparing Brazil with other emerging countries.

On the other hand, our experience suggests that the practice of fixing a date limiting the mining agreement does not effectively guarantee, a priori, the best solution, especially if the government does not have conditions or bargaining power to enforce a mutually satisfactory mining agreement. In fact the duration of the concession piles up the risk side of the project to create or exacerbate a natural bias in the decision process of most mining companies operating in developing countries to adopt a conceptual mining design favoring short payback periods. Furthermore, as time passes, the value of the property is degraded since the approaching renewal date of the mining agreement includes a significant risk component. From the side of the government, specially in emerging countries susceptible to an ever changing climate of business permeated by strict policies, the interest in attracting the investment usually implies a more flexible exercise of its bargaining power.

In spite of these arguments, this issue is so complex and controversial that it requires a comprehensive evaluation beyond the scope of this article, since the revision of the Brazilian Mining Code had not changed the unrestricted concession time regime in use.

It is undeniable that the new code provides substantial discretionary power to the government. A direct consequence is the increased demand over the institutional system in terms of proper availability of financial resources, expertise, strategic information system and equipment to face the additional workload. A typical example can be given when considering the revised time frame and associated conditions to undertake exploration and development projects.

Under the new law, projects whose feasibility is being challenged by adverse economic conditions may have their development postponed without detriment to the mineral concession title. This issue, despite its rightness and balance, creates the possibility for an eventual manipulation of interests and expectations, such as building up strategic reserves. The proper application of this legal issue will require a comprehensive level of technical capability and judgment from the government, not only to critically review the company report but to be well informed about the developing mineral markets. This issue together with the increasing integration of capital markets suggest that one important aspect pending government positioning is the distinction between *resources and reserves*.

The revision process of the Brazilian Mining Code did not involve any guideline about this old and unsolved issue, although it is a real and very important semantic dilemma considering the different approaches from CIM, IMM, AusIMM and US Geological Survey to mention just a few. In fact we are not sure that the Mining Code is the proper place to discuss this issue. Nonetheless, the government decision-making process will respect more detailed legislation that is in the process of publication. On the other hand, the ongoing efforts and discussions to reinforce the protection of mining investors can be useful to the Brazilian government. This is the case of a recent publication of the Interim Report of The Mining Standards Task Force sponsored by a "joint initiative of the Ontario Securities Commission and the Toronto Stock Exchange to examine the need for higher standards relating to the conduct of mineral exploration and mining activities".[9]

Notes

1. It is embodied in the Law no. 9 314, sanctioned on November 14, 1996.
2. Especially in terms of environmental protection and the cumbersome paperwork costs.
3. Vale (1998a).
4. The impact of the recent reduction on the price of gold was unquestionably leveraged by the fee on exploration permits putting in check the campaigns of several companies. The backward effects caused by this conjugated pressure is shaking apparently consolidated interests and open up new opportunities to outside players.
5. Respecting pre-existing rights and since it has maintained technical compatibility between the operations.
6. Vale (1998b).
7. DNPM (1997).
8. DNPM (1994).
9. Vaughan and Yuen (1998).

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