

C R I T E R I A I N F L U E N C I N G
I N T E R N A T I O N A L M I N I N G
I N V E S T M E N T

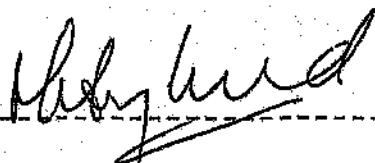
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A project report submitted to the Faculty of Engineering,
University of the Witwatersrand, Johannesburg, in partial
fulfilment of the requirements for the degree of Master
of Science in Engineering

Johannesburg, August 1995

DECLARATION

I declare that this project report is my own, unaided work. It is being submitted as partial fulfilment of the requirements for the degree of Master of Science in Engineering in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in any other University.



----- 6th day of ----- September ----- 1995

ABSTRACT

The decision making process in international mining investment involves the collation and interpretation of an array of economic, political, technical and financial criteria. Furthermore, the conditions underlying these criteria are changing continuously and the potential impact on any mining investment decision has to be re-evaluated accordingly.

To provide a foundation to researching the current mining investment environment a survey was carried out at the end of 1993 to gauge the opinions of senior U.S. based mining finance executives and selected South African executives. The overriding view was that, since the mid-1980's, there have been major changes to the global (mining) investment environment of which the demise of the former USSR was cited as the most significant event. Not only has the USSR undergone major upheavals but there have been political and ideological changes in many developing countries. Accordingly many, if not all, of these countries are having to re-define their investment (and mining) codes in order to attract development capital from the wealthier, industrialized nations. The importance of political and administrative structures in the mineral development process was often highlighted.

Following the survey, and to define more clearly the underlying forces at play, a calculating framework was developed to simulate the performance of a mining project in various countries. A range of representative criteria were included in the simulation, drawn from the mining

investment codes of five countries; Chile, Indonesia, Papua New Guinea, South Africa and Zimbabwe. Discount cash flow techniques were used to compare the project's investment performance in each country, with particular emphasis on assessing the relative impact of various criteria. Cash input and output mechanisms were also developed to follow the distribution of the project's monetary benefits to the main participants, i.e. the host governments, the countries as a whole and the foreign investors (both equity and loan providers).

The simulation provided a framework to demonstrate a series of mineral economic principles and to explain some of the trends being seen in the current mining investment environment. Some philosophy on the costs of political and administrative structures was also touched upon.

It is hoped that the research effort can contribute in some way to better understanding the constraints bedevilling many countries' stagnant mineral industries. The current situation on the African continent, and its poor investment record over many decades, is of particular relevance to the theme of this research project.

DEDICATION

In memory of my father,

John Seymour Aylward,

20 May 1922 - 7 March 1986

ACKNOWLEDGEMENTS

Particular acknowledgement is made of senior U.S. based and certain South African mining executives who provided valuable time to participate in the interview survey. Their opinions and insight from decades of experience established the foundation for this research project.

My thanks are also extended to Professor James Otto, Centre for Petroleum and Mineral Law and Policy, University of Dundee, Scotland for suggestions on reference material and his opinions on the subject.

Dr. Dick Minnitt kindly offered to read through one draft of the project and his comments were appreciated. My thanks go to Mr. Alan Naismith for some valuable debate on direction whenever it was needed. Nevertheless, responsibility for the final content rests entirely with the author.

Last, but certainly not least, to Lorna and Lara for their patience and moral support, particularly during the many hours working through 'blind alleys'.

CRITERIA INFLUENCING INTERNATIONAL MINING INVESTMENT

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1.0 INTRODUCTION

1.1 A Global Perspective

Throughout history the motive in investors' minds has been the same: to achieve the greatest return on investment for the minimal amount of risk. The element that does change continuously, however, is the composition of the investment environment; the participants, the resources, technologies and the geographic locality of asset deployment. Before making a decision to invest in a particular situation, or even remain invested for that matter, an evaluation of all relevant information would be essential. The process, when carried out diligently and interpreted correctly, would identify the most attractive investment alternative(s), inclusive of highlighting the risks involved.

The same investment principles can be applied to a mining development decision. Relevant factors which have to be considered in this instance would be the locality of the ore occurrence, its concentration and volume, the commodity markets, labour productivity, infrastructure availability, the country or regional political and economic structures. Of extreme importance, however, would be the stability of the operating and investment environment over time.

In view of these basic investment principles, together with the fact that there have been enormous changes to the world's political and economic structures during the 1980s and early 1990s, there was considerable scope for further research.

A good example of a major change to the global political landscape has been the demise of the former USSR and the transition to the Commonwealth of Independent States (CIS). Not only have the effects been felt within and near the confines of the former USSR, but also in more distant countries who were sympathetic to its ideologies. Without the ideological support base the latter countries have had to reconsider their fundamental policies and create environments competitive enough to attract long term foreign investment.

Paradoxically, the international environment presents many opportunities (and potential returns) for investors but the risks may also be greater. The situation in many parts of the world is still in a state of "flux" and may take several years, or even decades, to stabilize to the point where the expected returns to investors outweigh the risks.

In the light of the new 'playing field', mining investors most certainly will have to revise strategies around new cultures, evolving politico-economic and legal frameworks, different business and negotiating

methods, and poor or non-existent infrastructure. Ultimately, however, the long term success of a new mining development will, to a considerable extent, depend on the relationship between host governments and the providers of capital. Two of the more important issues to be considered would be firstly, the equitable allocation of the benefits derived from bringing mineral resources to account and secondly, ensuring that the terms agreed upon will be respected over the life of a particular project.

Assuming that all the 'players' can agree to work together it is highly likely that new sources of mineral/metal supplies will be developed over time. This situation must eventually impact on commodity prices and, to minimize the impact of this risk, mining financiers would be striving to invest in projects with operating costs in the lower portion of the global cost curve.

The objective of the research project is to explore in more detail the criteria which have been influencing the flow of capital towards mineral development, and to devise a framework to evaluate their impact on the performance of a mining investment. It is hoped that the approach may contribute in some way to a better understanding of the structures needed to support a robust and wealth generating mining industry. Of relevance to this theme would be the situation in many

of the African continent's mining industries which have operated far below their potential for decades.

1.2 Research Methodology

In the wake of the changes that have taken place in the international arena, such as the demise of the former USSR, various trends have already emerged which appear to be a reflection of the current mining investment environment.

One of the trends that has been given extensive press coverage over the past few years is the re-orientation of exploration focus of North American mining finance firms away from their home base. The developing regions have attracted much of this attention, with Latin America being the most prominent target. Some of the reasons cited for this trend were the uncertainty surrounding changes to long standing mining legislation (the U.S. 1872 Mining Law) and the lengthy and onerous environmental permitting procedures which add significant costs (and risks) to the project. Adding impetus to the migration to Latin America have been the well advertised revisions to mining investment codes in the region, of which Argentina and Peru have been at the forefront more recently. Chile continues to host a vibrant copper mining sector which has been achieved, not only through the quality of its mineral resources,

but also because of the country's competitive, stable and well administered investment environment.

To explore in more detail the criteria which have been influencing the strategies of North American mining firms, and to establish a practical foundation for researching the topic, a survey was carried out in the USA during October 1993. The survey was conducted by personally interviewing several (12) senior, U.S. based mining executives rather than adopting the easier, cheaper and more impersonal mailed approach.

After completing the USA survey and reviewing the results, it was realized that far more had been achieved than was initially expected. The level of seniority of the executives, their combined experience and co-operation made the exercise extremely worthwhile. It was then decided that the same issues should be discussed with selected South African executives to obtain a local perspective. Four senior executives were willing to participate and the interview phase was ended when a consistent base of opinion had been gathered.

The results of the survey have been presented in some detail because the opinions and comments made by the executives transcend, not only the more obvious technical factors affecting mineral development, but also the philosophies which determine long term

investment and planning strategies for mining finance and development companies.

Other researchers have recently undertaken surveys covering similar issues and the results of these have been compared briefly. Very clear and consistent messages emerged from the surveys which should be of some use to both host governments in their administrative capacities, and to the providers of capital (investors) in devising their investment and development strategies.

Although the executive and other surveys provided a foundation on which to further understand the salient criteria and philosophies influencing the current mineral investment environment, some means had to be devised to demonstrate the issues more definitively. Various approaches were considered:

- * Undertaking an exhaustive search, collation and analysis of data on the global minerals industry and determining the forces which have produced particular trends.
- * Carrying out a detailed case study on one, two or three specific projects, each in different countries, and determining the influence of the respective investment and mining codes.

* Adopting a more conceptual approach where the investment performance of a hypothetical mining project could be analyzed against a range of mining investment code criteria, the latter having been collated from a selection of countries.

Other aspects relating to the research process had to be considered:

* Consistency and standardization of data over periods long enough to identify trends.

* The time and cost of obtaining data for specific projects from proprietary sources.

* The confidentiality of the technical parameters and the strategic motivation behind those mining projects.

A further concern was that, by researching one or more project situations, the findings would become too specific and preclude global application. Comparisons would have had to be made with other mining investment situations in any event and the extent of the research process would have become prohibitive for purposes of this forum.

After due consideration of the above, and particularly because business decisions are driven predominantly by expectations of investment returns, it was concluded

that the development of a simulation model would be the most practical method of evaluating the issues. The simulation framework was designed to be flexible so that analogies could be drawn with any project anywhere in the world. The model also had to provide the means of measuring the range of impact of various criteria on a mining investment.

The flexibility of the simulation model has been significantly enhanced by current computer and information technologies; namely, extremely powerful modelling and calculating capabilities of spreadsheet-based programmes. The particular programme used for the simulation was Microsoft Corporation's Excel 5.0 for Windows. The programme provides the facility to link and interchange data which made the comparison of various measures between countries and mining projects more manageable.

In order to develop a representative calculating structure for the simulation, the mining investment codes of five countries were reviewed; Chile, Indonesia, Papua New Guinea, South Africa and Zimbabwe. The main reasoning for these choices, apart from the local interest in the latter two, was that they all had well established mining industries and, considering the current global trends, were developing countries.

In line with the conceptual approach, the performance of a hypothetical gold project (based on an average

sized Witwatersrand producer) was 'simulated' within each country's investment environment. The simulation model has been applied to the analysis of the following issues:

- * The competitiveness of countries in their bid to attract international investment capital for mineral development.
- * The relative impact of various criteria on the investment performance of a mining project in the selected countries.
- * Rationalizing the results of the executive survey, particularly from the perspective of expected rates of return and payback periods.
- * The distribution of the benefits generated by a mining project between the various participants, namely: the host government, the investors (both equity and loans), the employees and the providers of goods and services.
- * Explaining some of the philosophies and mineral economic principles behind current investment trends.

The underlying stance of this research project has been one of complete neutrality and objectivity. It is a clinical evaluation of the mining investment business in the interests of progress and growth and not a

representation from the point of view of either the owners of capital versus the trustees of the mineral resources, i.e. mining finance and development companies versus the host governments/countries respectively.

1.3 Limits to the Scope of Research

The research process covered virtually every engineering, socio-political, legal, financial and philosophical discipline. It was impossible to expand on many aspects to the level probably required and expected by respective specialists. An added complication was that global mining and investment conditions are changing continuously. Limits had to be drawn somewhere. Essentially, the project revolves around the concepts underlying the development of a framework for mining investment decisions.

Mention should be made that the author has no formal accounting training but a reasonable grounding has been acquired after some ten years experience in the mining finance and investment analytical industry. The financial simulations have been managed entirely using cash flow principles and, to minimize the chances of inconsistent treatment between countries, the different sets of data for each country were applied to exactly the same calculating structure. The latter structure was developed around a wide range of criteria usually associated with an international mining investment.

It will be observed that sensitivity analyses have been carried out as part of the simulation exercise but on a single parameter change basis. It was appreciated that, in reality, other parameters were likely to vary within probability ranges, as per a Monte Carlo type exercise. However, the objective of the simulation model was to compare the actual combinations (by country) of known quantitative criteria, all other things being equal. Under the probabilistic conditions the combinations of criteria would have made it impossible to compare the impact of individual criteria. It is accepted, however, that the Monte Carlo principle is a natural extension to the theme of the project.

In essence, this research effort is the product of:

- * historic knowledge of events that have impacted on the mining industry,
- * the current geo-political environment,
- * modern information (computer) technologies and,
- * the perspective and experience base of the author, comprising sixteen years practical mining geology and mining finance and investment exposure.

Above all, it is hoped that the contents and interpretations have come closer to the truth.....

2.0 SURVEY OF THE OPINIONS OF USA AND SOUTH AFRICAN BASED MINING EXECUTIVES

To provide a foundation to researching the current international mining investment environment, a survey by interview was undertaken in the USA in October 1993 to gauge the opinions of twelve (out of 18 approached) selected senior mining executives. For additional perspective, four (out of seven approached) South African based executives were also asked to participate. The number of executives eventually interviewed was a function of travel costs, a personal budget and the compatibility of appointment times.

2.1 Motivation for the Survey

2.1.1 Mining investment climate in North America

There has been extensive press commentary during the past few years concerning North American mining firms diversifying their activities away from their home base, with a very definite emphasis towards Latin America (Mining Journal, various issues: 1992c, 1993a, 1993b, 1993d; E & MJ, 1993; MB, 1992). The main factors underlying this trend have been cited as increased pressures from environment protection regulations (and lobbies) and continued uncertainty pending changes to

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the U.S. Mining Law of 1872.¹ These difficulties have contributed to increased legal, administrative and permitting times which can add significant costs to the mining development process. Some facts and figures on exploration expenditure by Silver (1993) support the gathering momentum of U.S. investment activity offshore.

These very real issues prompted the conclusion that senior U.S. based executives would be well versed in all the current criteria and philosophies influencing mining investment decisions in the international arena.

2.1.2 Constraints for S.A. mining firms

In contrast, and probably not through lack of desire, South African mining finance firms (mining houses) have been relatively restricted in expanding their global activities. The constraints were the result of the 'difficult' political situation in S.A. before April 1994 and the foreign exchange restrictions placed on residents and companies; the latter factor still remains a problem.

The origins of the mining houses may also have been a factor; in the sense that they themselves were products of capital investment from the industrialized nations a century ago. However, due to a diminishing inventory of

¹ Mining Magazine (1994e) provides a good overview of the history and issues surrounding the U.S. 1872 Mining Law.

local mining opportunities offering competitive returns for shareholders, a more outward looking strategy by all the mining houses has developed during the past few years (FM, 1993). Exploratory and other investigations into many geologically attractive parts of the world have been continuing.

An analogous situation to that of the North American mining firms is suggested for the S.A. mining houses where, just as Latin America is providing an attractive destination for the former, Africa potentially offers a range of opportunities for the latter. The circumstances behind the two groupings are different but the prospects of better returns, growth in earnings for shareholders and utilization of skills are a common denominator.

The point that needs to be emphasized is that South African mining houses have been relatively disadvantaged in the 'scramble' for new mining investment opportunities in the international arena.

2.2 Survey Methodology

2.2.1 Participants and interviews

Within the time allotted and budget constraints (personal funding) it was possible to interview sixteen executives from fourteen mining finance and related

firms. Their details have been provided in Appendix A, inclusive of the dates of the interviews.

It was decided not to mail out numerous (if not hundreds) questionnaires, but to rather interview selected executives (as senior and experienced as possible) and apply the principle of quality as opposed to quantity. It was also feared that the mailing method would result in low and extended response rates, as was experienced by Otto (1992: 330). It was felt that the interview approach would add spontaneity and more depth to the subject. In fact, several executives mentioned that the personal approach was appreciated.

Overall, there was tremendous co-operation and tolerance from all executives, for which the author is most grateful. It was agreed, however, that confidentiality be maintained as to identification with particular comments and opinions. The reason for this was that some of the opinions may not have been the views of the companies for which the executives worked.

2.2.2 Questionnaire design and responses

A questionnaire format comprising seven question topics was compiled to facilitate discussions and ensure consistency in the interviews. The question topics have been documented below for reference together with the discussion of the results.

The questionnaire was designed to be answered predominantly with numerical (or coded) responses but there was also considerable discussion and debate, in fact far more than was ever expected. For reporting purposes the averages of the coded responses have been presented below rather than itemizing the more than 500 individual entries. Assurance is given that this method accurately reflects the "mood" prevailing at the time of the interviews. It is believed the findings are still very relevant now - perhaps even more so because enough time has elapsed to confirm or refute them. Should further clarity be required in the interpretation of the average coded responses, the tables in Appendix B detail the distribution of the codes tendered for each question.

The total number of response "counts" for each question may not reflect the full number of executives. The reason for this was that some executives opted to give broad responses to the more detailed questions. This applied particularly to question topic 3 where executives preferred to combine the exploration and production phases of projects while reviewing the components of countries' investment and mining codes. Similarly, for question topics 4 and 5, where executives were asked to indicate their preference for various countries and regions, some felt that it was not necessary to differentiate between the exploration (topic 4) and production phases (topic 5). This then precluded some executives from offering expected

returns on investment and payback periods for the production phases in the selected countries. Two executives mentioned that they were not sufficiently up to date on developments in some of the countries and preferred not to respond.

If there were any deficiencies in the coded responses these were certainly more than compensated by the comments and opinions provided. It was deemed most important that all these views should not be 'lost' and was the principal reason for recording the details chronologically in Appendix C.

Although one hour was allocated, some interviews lasted up to two hours and was dictated by the time that executives were willing to provide on discussing anecdotal experiences and personal philosophies. In hindsight, however, the questionnaire was too long as the responses to questions 6 and 7 tended to become rushed and less focused. For this reason no clear conclusions could be drawn from those responses and the results have not been presented. The question topics appear only as a matter of record in Appendix D.

2.3 Discussion on the Survey Results

To discuss the results of the executive survey the following format has been adopted for each question topic:

- * A record of the question topic (*highlighted in italic print*) for reference purposes.
- * The results of the coded and other numerical responses, given as an average. Although the coded responses have been based on single integers, the averages have been recorded to one decimal point and should be interpreted in exactly the same way.
- * The author's discussion and interpretation of the results, based on the opinions of the executives (refer to Appendix C for the individual comments).
- * Additional views relevant to each question topic have been sourced from various references. These have been noted in a separate section after the discussion to avoid confusion with the opinions of the executives.

2.3.1 Question topic 1: Setting the scene

The following comment has been drawn from Anglo-American Corporation's 1993 annual review (AAC, 1993): "The changes taking place in (South Africa and) much of the world beyond us have widened the Corporation's horizons, offering the prospect of a challenging and dynamic period of renewed growth". Do you agree that this comment could apply to your company?

Responses:	Yes	13
	No	1
	Partially	0

Discussion and interpretation

There was almost unanimous agreement that a wide range of opportunities had emerged. These are, however, associated with radically different business environments and new strategies and management plans are having to be devised.

Ultimately, this situation has arisen from far reaching changes to global mega-political structures, e.g. the events surrounding the demise of the former USSR. An extension to these events is the trend towards privatization (of state owned or controlled assets) and pursuance of free-market principles, particularly in the developing countries.

One U.S. based mining executive has called this a 'push-pull' scenario; with the 'push' being generated by the prohibitive legislative and permitting procedures in North America, and the 'pull' stemming from modifications to many countries' investment and mining codes in Latin America.

Referenced opinions

Sir Arvi Parbo (1993) offers a stimulating view of the 'world environment for the minerals industry', covering the changes that have taken place (China and the former USSR) and the movement of mineral exploration activity

from the developed to the developing countries. Interestingly, it was observed that the operating environment was likely to require a new range of mining professionals with multi-disciplinary skills. Parbo describes these professionals as those 'who can see the answer before most of us have even grasped the question'.

2.3.2 Question topic 2: Global events and situations

The following situations appear to be influencing trends in international mining investment. What is your view of the degree of impact each has had, or is likely to have, on these trends? Enter codes for major (3), moderate (2), minor (1), or no impact (0).

Table 2.1 overleaf displays the average of the coded responses.

Discussion and interpretation

The principal driving force was concluded to be the trend towards privatization (de-nationalization) of state owned and/or controlled business entities. It was suggested by most executives that the catalyst behind this trend was the collapse of the former USSR. As a result, the support has dried up for many sympathetic political structures across the globe, many of which were situated in the developing world. In effect, the costs and uncertainties (risks) attached to doing

business within these centrally planned structures have now been reduced substantially.

Table 2.1 Survey responses: Events and situations

Events and Situations	Averages of coded responses
a. The collapse of the former USSR (6*)	2.5
b. The politico-economic changes taking place in China (1*)	1.6
c. The changing climate for mining investment in Latin America (8*)	2.6
d. The pending changes to the U.S. 1872 Mining Law ² (1*)	1.3
e. The Mabo native title case in Australia ³	1.3
f. The global trend towards privatization (4*)	2.7
g. The increasing attention to environmental issues (2*)	2.4
h. The political changes in South Africa	1.3

NOTE: (8*) denotes number of executives choosing the event as having the most dramatic impact, as discussed below.

Are there any other situations which should be included in the list?

No other situations were suggested by the executives.

² See Mining Magazine (1994e).

³ The case caused a major debate and introduced considerable uncertainty around security of title in Australia (Mining Journal, 1993c: 210-211).

Which situation(s) above, in your opinion, has(ve) had or will have the most dramatic impact on trends in mining investment? Please write a. and b. etc. and include a brief explanation for your choice.

The executives' choices for the most dramatic impact have been shown in Table 2.1 in parentheses, e.g. (8*). The number of responses total 22 because some executives gave more than one choice. This was due to the association of a. - the break-up of the former USSR with c. - the politico-economic rejuvenation of Latin America and f. - the trend towards privatization.

Discussion and interpretation continued:

In response to these new realities many countries have had to critically review and modify their political sympathies and foreign investment codes in order to attract foreign capital. There was likely to be further pressure to address these issues because the management structures controlling the world's capital pool have access to state-of-the-art information technologies. This has enabled investors to be far better informed about all the investment alternatives and the respective risks and returns.

These trends have not gone unnoticed by investors, particularly North American firms, which have shifted their mineral exploration and development emphasis away from the traditional areas of focus such as North

America and Australia. Adding impetus to the "migration" have been the increasingly onerous legislative and environmental procedures associated with mining development in North America. These were cited by the executives as being extremely difficult to manage and finalize.

There was widespread concern among executives about the increasingly vociferous "lobby" for environmental protection which is playing a major role in the decision-making, administration and development processes within the mining industry. Although the main thrust of the "lobby" appears to be concentrated in the First (or industrialized) World, it was widely felt that standards were likely to be uniformly applied throughout the developing countries as well. Some executives mentioned that the mining industry, as a cohesive front, could have done much more to present a balanced view of the costs and benefits of mining as applied to the welfare of society.

The net effect of these global factors is that the risk and return equation has tipped away from the developed or industrialized countries in favour of many under developed or "emerging" countries. Almost any part of the globe with favourable geology is a potential target, subject to political and legislative stability or war situations!

Referenced opinions

Aldous (1993) has elaborated on virtually the identical issues raised by the executives. It was more than coincidence that an Australian should be coming to exactly the same conclusions, but recommending a foreign investment strategy for Australian mining companies. The influence of the demise of the former USSR was mentioned as an important catalyst for a new world order. The paper is an excellent appraisal of the philosophies driving the global mining industry and appropriate investment strategies.

These issues have been commented upon widely in numerous other publications. Of note, for example, are articles in Mining Magazine (various issues: 1994b, 1994c and 1994d) on Peru which has been aggressively marketing its mineral development potential and advertising modifications to its investment codes. An extensive privatization programme has also been implemented in Peru.

Matthews et al. (1987) classified various situations affecting the investment decisions of U.S. based mining firms in terms of a 'push - pull' scenario, as did one of the executives interviewed:

'Push' investment from the USA: Low grade deposits, high development and operating costs and government regulations, i.e. environmental laws.

Then there is the lure of higher grade deposits in the lesser developed countries, lower labour costs and investment incentives.

'Pull' investment to the USA: Relative stability in respect of political system, economic policy, legal system and even the environmental laws, although harsh, have a semblance of predictability.

Then in developing countries there are uncertainties with political systems, government interference in management, changes to existing laws (minimum wages and taxes) and additional development costs, such as for training, schools and housing. The threat of nationalization is also a major fear of mining financiers because of the long term nature of the business.

The case of the Windy Craggy copper-gold deposit in British Columbia (BC), Canada is a good example of the uncertainty that environmental interests can introduce, thereby influencing the flow of development capital to the mining industry (Mining Journal, 1993e, 1993f). The promoters of this deposit had already spent some \$US60 million on evaluating the property and then the BC government announced that the area was to be included in a national park and permanently protected. Compensation has been sought in excess of the amount spent on exploration because of the reserves delineated and the risks taken.

Are the 1990's Riskier ?

Do you believe that the current 1990's mining investment environment is riskier than at any other time during your professional experience?

Responses:	Yes:	6
	No:	5
	Undecided:	3

What principal factor(s) come(s) to mind in support of your view?

Discussion and interpretation

There was no clear cut consensus as to whether the current mining investment environment was riskier in the 1990's than at any other time in recent history (last years or so). The executives, however, believed that "state-of-the-art" institutional financial and technological facilities were now available to counter the current risks. Several respondents mentioned that the multi-lateral organizations such as the World Bank, IFC (International Finance Corporation), and insurance cover provided by MIGA (Multi-lateral Investment Guarantee Agency) and OPIC (Overseas Private Investment Corporation), had contributed significantly to the stabilization of untested mining investment environments. Another factor tending to reduce the

risks was that the developing countries have been far more 'investor friendly' than they were.

Referenced opinions

Milton Ward (1993), Chief Executive, Cyprus Minerals Company (USA), covers many of the risk factors attached to foreign mining investment. In essence, foreign exploration is worth the risk at present and, in any event, many of the risks can be minimized with 'proper planning and use of safeguards'. Furthermore, although the likelihood of expropriation has been reduced significantly, mining companies must continue to build on relationships with governments, employees, environmentalists and landowners. Ward suggests some underlying philosophies driving current mining investment sentiment:

- * The desire to find a major ore-body; the chances have diminished in the developed countries but there have been some major finds in Chile (Escondida), Indonesia (Erstberg-Grasberg), Russia (Udokan).
- * Generally problems of foreign investment are still greater than domestic investment, so the orebody must be world-class to compensate for the risks.

The main conclusion that can be drawn from both the executive survey and Ward's opinions is that the potential benefits being offered by the developing

countries considerably outweigh the risks involved. One hopes that this can be sustained in the long term.

2.3.3 Question topic 3: Country risk factors

The following factors are consistently cited as the more important contributors to the success of mineral projects (assuming that the project specific factors such as geology, grade, etc. are considered favourable). What is your view of the importance of each factor in firstly, the exploration phase and secondly, the production phase? Enter codes for major (3), moderate (2), minor (1), or no importance (0).

Table 2.2 overleaf displays the average of the coded responses.

Discussion and interpretation

There was no doubt that political stability and administrative efficiency were the most important considerations for foreign investors in mining projects. Other important underlying criteria appeared to be security of tenure and foreign ownership laws, taxation policies and availability of foreign exchange. The latter issue was essential so that all financial commitments could be fulfilled, such as redemption of banker and customer loans, investors' remittances of capital and earnings, management fees and purchase of materials and equipment for the project.

Table 2.2 Survey responses: Country risk factors

COUNTRY FACTOR	Exploration	Production
	Phase	Phase
	Averages of responses given	
a. Infrastructure, e.g. roads, etc. (1*)	1.4	2.5
b. Climate (including altitude)	0.9	1.1
c. Local skills availability	0.6	1.4
d. Access to local database (1*)	1.5	0.6
e. Control of project management (2*)	1.8	1.3
f. Previous experience in the country	1.6	1.9
g. Political stability (8*)	2.8	2.9
h. Legal system (1*)	2.8	2.7
i. Foreign ownership laws (3*)	2.9	2.7
j. Foreign exchange availability (1*) (including repatriation of earnings)	2.8	2.9
k. Price controls on productive inputs	2.5	2.4
l. Control over marketing of products (1*)	2.7	2.7
m. Fiscal (taxation) regime (2*)	2.9	2.9
n. Security of tenure (4*)	3.0	2.8
o. Government efficiency, i.e. time taken for approvals	2.7	2.5
p. Environmental regulations	1.8	1.9
g. Host government's "understanding" of mineral affairs	1.9	2.0
r. Involvement of agencies such as the World Bank/IFC and the EBRD. (1*)	1.6	2.0
s. Insurance cover, i.e. MIGA, OPIC. (2*)	1.7	2.3
t. Involvement of more equity partners	0.9	1.0

NOTE: The numbers in parentheses (8*) indicate the number of respondents that chose that (those) factor(s) as the most important.

Are there any other factors which should be added to the list?

No other factors were added to the list by the executives.

Discussion and interpretation continued:

By inference therefore, a truly representative and stable government was essential for the establishment and maintenance of a consistent and transparent (foreign) investment code. In other words, the 'goal posts' should not have a history of being moved around unexpectedly.

Interestingly, factors such as climate, infrastructure and skills' availability were not considered major obstacles in comparative terms. Environmental factors, although important, did not appear to be a major deterrent in relative terms because of the world-wide trend towards uniformity.

In essence, the greater the uncertainty and potential loss of control associated with an investment, the greater the risk premium attached to the expected return (see also section 4.1 on risks and returns). Looking from another perspective, the more uncertain the environment, the less the price an investor would pay for the same anticipated earnings profile. Investors must have sound, credible structures on which to base evaluations of the likely returns on their investment.

Most of the executives thought that differentiation between exploration and production phases was not necessary. All criteria would be carefully evaluated before committing funds even for exploration.

Referenced opinions

Cook (1986) undertook an analysis of non-Communist world mineral discoveries over the period 1943-1983 and provides a useful list of names, commodity, locality and owner. The analysis shows a marked increase in discoveries up to the mid-1960s and then a gradual decline. A key conclusion reached (Cook, 1986: 94), however, was that mining investors target countries with stable governments and who welcome foreign investment. Important underlying issues mentioned were sanctity of land tenure, competitive tax policies and ability to repatriate profits.

Coplin and O'Leary (1983: 52) have proposed a method of analyzing political risk as applied to the extractive industries. Essentially the methodology was a far more rigorous analysis of the factors in Table 2.2 so that comparisons could be made between countries. The two basic steps suggested were firstly, to assess the importance of political factors on the company's operations and secondly, to forecast the likelihood of each of these factors taking place in the future. Notwithstanding the detailed analytical mechanisms, the general theme revolved around the stability of the

regime and political turmoil; these must affect the permanency of policies and laws controlling foreign investment.

Project evaluation methods

Assuming the factors listed above have been assessed as favourable, how would you rate the following evaluation methods in the investment decision making process? Enter codes for essential (3), useful (2), of little use (1) or no use (0).

Table 2.3 Survey responses: Project evaluation methods

	Evaluation Method	Averages of responses given
u.	Internal rate of return (IRR)	2.3
v.	Net present value (NPV)	2.0
w.	Cost curve analysis	2.5
x.	Payback period (PBP)	2.3
y.	Sensitivity analysis	2.4

Discussion and interpretation

As far as project evaluation methods were concerned the average coded responses showed no definite preferences. In discussions, however, and considering the distribution of responses (refer to Appendix C), some emphasis was detected on cost curve analysis and payback periods. The usage of the payback period was not surprising because of the risks attached to investing in (developing) countries without records of

stability and competitive investment policies. As mentioned previously, many countries' investment codes have been changing rapidly to allay these perceptions and, in time, significant benefits should accrue to investors in the mining industry and the host countries.

As an overall observation, decision-makers appear to utilize all evaluation methods, but to the extent that the relative merits of an investment can be shown unambiguously against alternatives.

2.3.4 Question topic 4: Exploration attractiveness

What would be your degree of interest in commencing an exploration programme in the following regions and countries, firstly in the current 1990's decade and then, for comparison, assuming the environment that was prevailing in the 1980's? (If there is no change in a particular case then leave the 1980's space blank). Enter codes for strong (3), moderate (2), weak (1) or no attraction (0).

Table 2.4 presents the average of the coded responses and Figure 2.1 thereafter displays the same data in ranked, graphic format.

Discussion and interpretation

Latin America was clearly the most attractive region and registered the greatest change in sentiment for the better compared with that prevailing in the 1980's.

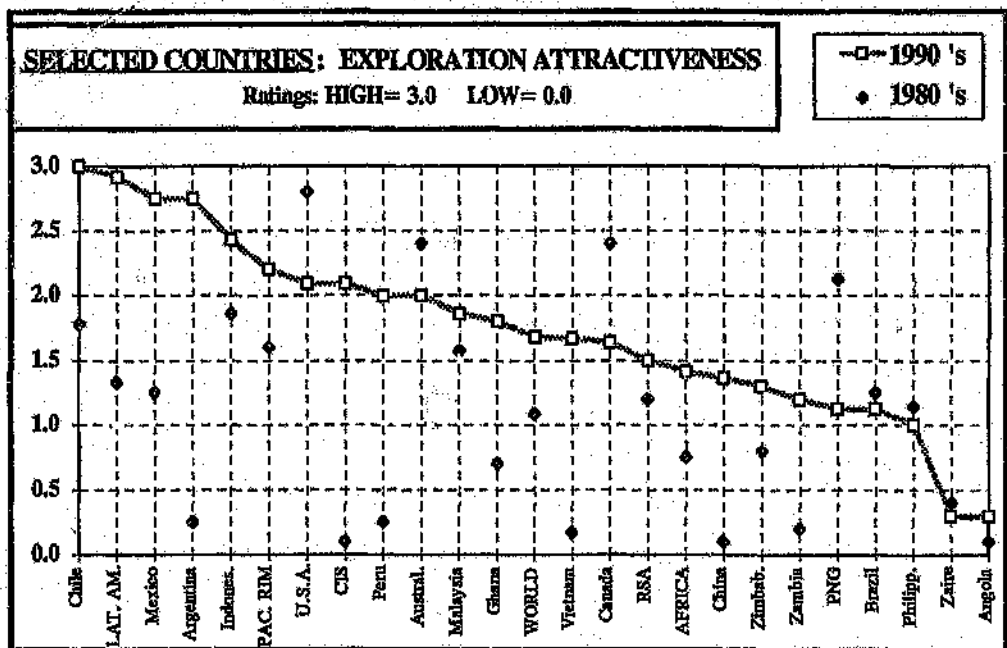
Chile, Argentina and Mexico were considered to be the most attractive countries, even featuring highly on a

**Table 2.4 Survey responses: Exploration
attractiveness**

REGION/Country	Change	The 1990s	The 1980s
**Averages of responses given			
AFRICA	+0.6	1.4	0.8
Angola	+0.2	0.3	0.1
Ghana	+1.1	1.8	0.7
South Africa	+0.3	1.5	1.2
Zaire	-0.1	0.3	0.4
Zambia	+1.0	1.2	0.2
Zimbabwe	+0.5	1.3	0.8
LATIN AMERICA	+1.6	2.9	1.3
Argentina	+2.5	2.8	0.3
Brazil	-0.2	1.1	1.3
Chile	+1.2	3.0	1.8
Mexico	+1.5	2.8	1.3
Peru	+1.7	2.0	0.3
PACIFIC RIM	+0.0	2.2	1.6
Indonesia	+0.5	2.4	1.9
Malaysia	+0.3	1.9	1.6
Papua N. Guinea	-1.0	1.1	2.1
Philippines	-0.1	1.0	1.1
Vietnam	+1.5	1.7	0.2
OTHERS			
Australia	-0.4	2.0	2.4
Canada	-0.8	1.6	2.4
China	+1.3	1.4	0.1
CIS	+2.0	2.1	0.1
USA	-0.7	2.1	2.8
World "Index"	+0.6	1.7	1.1

** The coded figures given for the regions may not equal the average of the underlying countries because some executives gave responses for the regions only. For clarity on this issue refer to the distribution of coded responses in Appendix B. World "Index" represents the overall exploration environment.

**Figure 2.1 Exploration attractiveness:
Country and region ranking**



global basis. Although Peru did not appear to be as attractive at the time of the interviews, recent press reports (Mining Magazine, 1994b, 1994c and 1994d) suggest that sentiment could be changing; the country has been busy promoting its mineral potential and has modified investment policies. Brazil was not considered attractive in relative terms, but competition from neighbouring countries and their more investment-

friendly policies may force a change (see also referenced survey in section 2.4.3 later).

Interest in African countries appeared to have improved quite markedly in the 1990's from the very low base, not only in the 1980's, but for some three decades. The change in sentiment, however, was nowhere near as marked as that displayed for Latin America. It has been observed, since the democratic elections in South Africa in April 1994, a far more pervasive and positive mood has started to emerge throughout Africa.

The Pacific Rim area, i.e. Indonesia, Malaysia, Papua New Guinea, etc. was graded between Latin America (highest) and Africa (lowest) for mineral exploration attractiveness. Indonesia was rated the most attractive of the countries in the region, while Papua New Guinea (PNG) had lost much of its investor interest during the past 5 to 10 years.

The traditional interest during the 1970's and 1980's in Canada, the USA and Australia has definitely waned, with sentiment towards Canada declining the most. As mentioned previously, the legislative and environmental problems, coupled with the more positive business climate in the developing regions, have largely been responsible for the trend.

Interest in China and the CIS has increased markedly compared with the total lack of interest shown in the

1980's (and for decades before that). Although there appeared to be a slight preference for the CIS region, it was detected that sentiment was more attuned to the vast potential of these enormous regions; mining investors basically cannot afford to ignore them. In other words, the expected rewards tended to outweigh the uncertainties (or risks) attached to the political and economic transitions underway, even though these will probably continue for many years still.

One executive commented that China offered a more stable investment environment than the CIS because China had liberalized its economic policies but had maintained a firm hand on the political structures. On the other hand, the CIS had liberalized both elements at the same time which could make the transition far more difficult to control. There was a danger that the CIS could eventually break up, heralding regional instabilities and rendering investment even more hazardous.

Referenced opinions

Rath (1995), writing for the Mining Journal, certainly shares similar views on Latin America as those given by the executives. Exploration expenditures in the region have soared to US\$500 million, five times the level of four years ago. Comment was also made that Chile started meaningful reforms in the mid-1970s and, although other Latin American countries have been

reforming of late, the 'risks are an order-of-magnitude higher' than Chile. Presumably this is because it takes time for new policies to become entrenched and the country to show a stable track record.

The comparative lack of interest in mining investment in Brazil has been ascribed to the constitutional restrictions on majority foreign ownership (Mining Journal, 1992b: 61). It is debatable how long Brazil can remain the 'odd one out', however.

Aldous (1993: 273) offers views on trends in development activity by country or region, which broadly concur with the opinions of the executives in the survey. The views were qualified, however, in that they were based on subjective observations and initial statistics (originally sourced from the Metals Economic Group in Halifax, Canada) on exploration expenditure. Latin American countries were attracting a strong following and, although Africa was widely perceived as a risky prospect, there appeared to be some renewed interest emerging. It was even observed that the South African mining houses were 'more comfortable with Africa' and activity has been picking up noticeably from this quarter. Specific mention was made about the CIS, its vast land mass and mining expertise, but there have been difficulties in implementing the requisite free market and legislative structures.

A good example of the potential in the CIS can be found in the Sukhoi Log gold deposit in eastern Siberia (Mining Journal, 1995c: 129). The resource has been estimated to contain in-situ reserves of more than 80 million ounces (2500 tonnes) gold, some four times the 1994 gold production of the South African gold mining industry (COM, 1994). Gaining the necessary rights to develop the Sukhoi Log area was apparently a protracted affair but, by all indications, was entirely worth the effort.

Of relevance to the negative view of PNG (Mining Journal, 1994) was the recent case where landowners were claiming from BHP, the managers of the Ok Tedi copper/gold mine, some A\$4000 million because of alleged pollution to the Fly river from mining activities. This has been only one of several disputes involving local landowners and the operators of PNG mining projects. These situations can only increase investors' nervousness about PNG and the relative safety of longer term capital in that country.

2.3.5 Question topic 5: Rates of return (IRR) and payback periods

Assuming a risk free internal rate of return (IRR), i.e. government bonds etc., as the base reference point, what premium return (in percent) and then payback period (PBP) would entice you to invest in a 'world class' deposit in the following regions and countries? Also, in similar fashion to question topic 4.,

indicate the measures you would have expected in the 1980's (leave blank if no difference).

Table 2.5 overleaf displays the averages of the responses and Figure 2.2 thereafter presents the same information in ranked, graphic format.

It is pointed out that the figures reflect the opinions of the U.S. executives only. The S.A. executives made the following comments:

- * returns on non-S.A. mining projects should be at least double those expected in the S.A. mining environment.

- * more attention should be applied to payback periods when investing in unfamiliar countries.

Discussion and interpretation

It was surprising to see the magnitude of expected returns and the payback periods that would be required by the U.S. executives (see also the referenced opinions below). There was, however, consistency in that the individual responses were of a similar order of magnitude and that there was an inversely proportional relationship between the two measures, i.e. high IRR / low PBP.

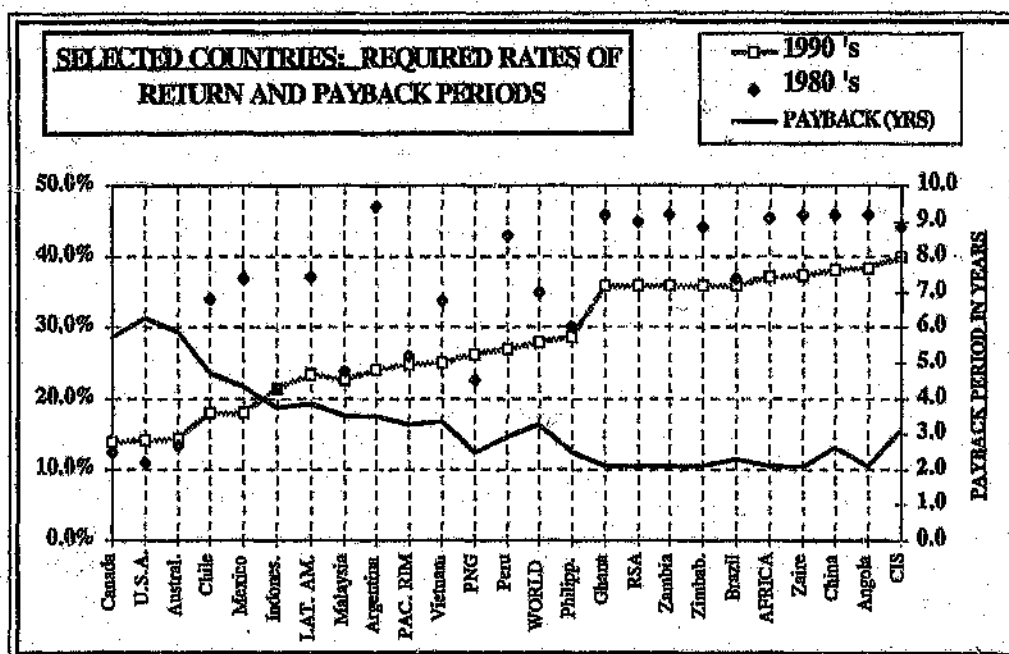
**Table 2.5 Survey responses: Rates of return (IRR)
and payback periods**

REGION/Country	The 1990's		The 1980's	
	IRR (%)	PBP (yr.)	IRR (%)	PBP (yr.)
**Averages of responses given				
AFRICA	37.0	2.1	45.4	1.9
Angola	38.3	2.1	45.8	1.9
Ghana	35.8	2.1	45.8	1.9
South Africa	35.8	2.1	45.0	1.9
Zaire	37.5	2.1	45.8	1.9
Zambia	35.8	2.1	45.8	1.9
Zimbabwe	35.8	2.1	44.2	1.9
LATIN AMERICA	23.3	3.8	37.2	2.5
Argentina	24.0	3.5	47.0	1.7
Brazil	36.0	2.3	37.0	2.5
Chile	18.0	4.7	34.0	3.5
Mexico	18.0	4.3	37.0	2.5
Peru	27.0	2.9	43.0	1.5
PACIFIC RIM	24.8	3.2	26.0	2.9
Indonesia	21.3	3.8	21.3	3.5
Malaysia	22.5	3.5	23.8	3.3
Papua New Guinea	26.3	2.5	22.5	3.8
Philippines	28.8	2.5	30.0	1.8
Vietnam	25.0	3.3	33.8	2.0
OTHERS				
Australia	14.3	5.9	13.3	5.7
Canada	13.8	5.7	12.5	6.2
China	38.0	2.6	45.8	1.1
C.I.S.	40.0	3.1	44.3	1.2
USA	14.0	6.3	10.3	7.2
World "Index"	28.0	3.3	34.4	2.8

**** The regional figures may not exactly equal the average of the underlying countries' figures because some executives only gave**

responses for the regions. World "Index" represents the overall operating environment.

Figure 2.2 IRR and payback period:
Country and region ranking



For the 1990's (the 1980's are compared in brackets) the two extremes were:

- * African countries as the least attractive, with an expected IRR in the 35-40 per cent (40-50 per cent) per annum range and PBP of 2 (<2) years, and
- * the U.S. and Canada in the 13-15 per cent (10-14 per cent) per annum range with a PBP of 5-7 (6-8) years.

Between the above two regions, Latin American countries were attractive to financiers with IRRs ranging from 18-36 per cent (30-50 per cent) and PBPs ranging 2-5 (1-4) years. A project in Chile, the "darling" of the developing regions, would need to register an IRR of just below 20 per cent (34 per cent) per annum and a PBP of 5 (3,5) years. The Pacific Rim was rated between Africa and Latin America but was closer to the latter region's ratings.

These ratings were mostly consistent with the coded responses given for the exploration attractiveness analysis (question topic 4). There was an exception in the ratings for the USA, Canada and Australia where, for exploration, these regions' attractiveness was not much higher than for Africa. For the production phase, however, they were still considered the least risky. This may appear a contradiction but it could be argued that North America and Australia have been relatively over-explored. The chances of finding deposits in the developing regions, profitable enough to counter the risks involved, appeared to be far greater. An additional explanation could be that the prospectors' speculative desire to achieve the enormous capital gains if an exploration programme made a new discovery of a world class mineral deposit.

In retrospect, and notwithstanding the USA-Canada-Australia anomaly, it may not have been necessary to differentiate between the exploration and production

phases. Most executives mentioned that the country or regional rankings would be similar for each phase. This indicated that, in the decision-making process, focus was placed on the mining investment codes (as discussed previously -- question topic 3) and that a thorough evaluation would be carried out before committing funds even to an exploration programme.

An interesting dimension that emerged from this section of the survey was the differing perception of risk and return between the U.S. and South African executives. U.S. based executives regarded most countries in Africa as relatively unattractive, while South African executives tended to be far more positive about involvement in the continent. This probably can be attributed to familiarity and experience with an operating environment, let alone the benefits derived from accessibility, that is, the USA with Latin America and the RSA (and Europe) with Africa. In other words, executives tended to see their own operating base as the investment reference point for measuring risk and return. Following on from this, some issues can be highlighted for strategic planning purposes:

- * The benefits of foreign firms joint venturing with local partners instead of transferring tried and tested (in another environment) personnel. The latter might find it difficult acclimatizing to radically different conditions, culturally and otherwise. In this context mention was made by one executive of

recognizing the full range of costs of moving personnel out of familiar culture and "comfort" zones.

- * The ability of the older generation in the mining industry to accept the need to diversify away from familiar and traditional environments. If the appropriate, and possibly uncomfortable, strategies were not implemented timeously, earnings growth might suffer in the long run, relative to competitors.

In essence, these issues allude to the management of change.

Referenced opinions

McDonald (1993) reviews the issue of rates of return from an historical perspective of the Australian mining industry. He offers a succinct explanation of the valuation of shares in the market-place where a share price adjusts to the investors' expected return, based on projections of earnings (or dividends) and the share price at the end of the period. Based on this premise McDonald carried out an analysis of the returns achieved by the Australian industry for different intervals over the last 100 years.

It appears that the real return actually achieved by investors was of the order of 3 - 5 per cent per annum. However, a case was made that the required returns were

more towards the 6 - 7 per cent range, when allowing for the cyclical (risk) nature of the mining industry. Even so, McDonald mentioned that the mining industry's managers were using real discount rates of 10 - 15 per cent in project evaluations. These levels compare closely with those shown for Australia in the executive survey and, by analogy, must be a fair reflection of the returns required on North American mining investments. McDonald does pose the question whether the latter returns are too onerous, thereby stifling the amount of development that the market returns suggest should be taking place.

Attention is drawn to the findings of a survey initiated by the World Bank (1992) which are discussed later in section 2.4.2. Briefly, however, the returns required by respondents on mining investments ranged from 25-30 per cent for developing countries and 20 per cent for industrialized countries. The payback periods envisaged were 2-4 years and 5-6 years respectively. These figures broadly agree with those given in the executive survey and by McDonald (op. cit.).

2.3.6 Question topics 6 & 7: Incomplete results

Two other topics were included in the questionnaire which are shown for the record in Appendix D. Although several executives did offer their comments and opinions, there were no clear, discernible trends. In

hindsight it was apparent that the responses were rushed because of time constraints after completion of question topics 1 through 5. It was unfair in the circumstances to expect executives to give well-considered views of detailed subjects such as those in topics 6 and 7.

Briefly, the objective behind topic 6 was to gauge the trade-off between low value per unit mass, e.g. iron ore and copper concentrates, compared with the high-value per unit commodities, e.g. diamonds and gold. It is probably logical in any event that focus should be on the latter commodities due to infrastructural problems in developing countries.

Question topic 7 was designed to draw opinions on the range of skills (or emphasis) needed in today's international mining environment. It was disappointing that more time could not be spent on this issue. Comments that were provided, however, indicated that this would be a particularly useful subject for further research. It would encompass the impact of cultural mixing, the influx of technological innovation, the availability of skills, training requirements and the cost attached.

2.3.7 Feedback on the survey

This concludes the questionnaire format but please would you add any issues which have not been adequately addressed ?

No further comments were put forward by the executives. They were asked, before closing each interview, to give their honest views on the questionnaire (not all executives participated in this, however):

Do you think the questionnaire has been:

A worthwhile exercise? Yes: 9

Interesting for you? Yes: 9

No : 1

Too long? (mark your choice) Yes: 2

Too short?

About right? Yes: 8

*Timely at this point in the
history of the mining industry?* Yes: 12

2.4 Findings of Other Surveys

In order to add credence to the results of the executive survey relevant sections of three other surveys have been compared.

2.4.1 Otto's survey

Otto (1992) undertook a survey to evaluate the criteria that mineral companies used when making mining

investment decisions. The survey's structure was quite different to the executive survey but the theme comparable. Furthermore, Otto's survey concentrated on countries in the Asia-Pacific region whereas the executive survey had a more global perspective.

Otto's survey was carried out by mailing questionnaires to 100 companies world wide. Initially there was a poor response rate and companies had to be contacted again by telephone or fax transmission. Eventually the following response rates were recorded:

<u>Companies contacted</u>	:	<u>100</u>
Completed questionnaire	:	39
Declined to participate	:	15
Companies not responding	:	45
Companies responding too late	:	1

Otto also found that companies did not answer all parts of questions, similar to the experiences in the executive survey.

A set of results in Otto's survey, comparable with section 2.3.3 (country risk factors) in the executive survey, has been presented in Table 2.6. The table is a reproduction of Table 2.2 in abbreviated format with Otto's results 'translated' and inserted (in italics) as shown. Appendix E displays Otto's table for reference and, to clarify the comparisons, letters have been inserted in Appendix E to show which criteria were

matched with those in Table 2.6. Otto included more categories which were more specific than those used in the executive survey.

Table 2.6 Comparison with Otto's survey findings

COUNTRY FACTOR	Exploration		Production	
	Execs.	Otto	Otto	Execs.
a. Infrastructure	1.4	1.8	2.1	2.5
b. Climate	0.9	1.2	1.3	1.1
c. Local skills	0.6	1.7	2.0	1.4
d. Local data	1.5	1.9	N/A	0.6
e. Management control	1.8	2.7	2.7	1.3
f. Country experience	1.6	1.4	1.7	1.9
g. Political stability	2.8	2.6	2.6	2.9
h. Legal system	2.8	2.5	2.6	2.7
i. Foreign ownership	2.9	2.5	2.6	2.7
j. Earnings repatriation	2.8	2.7	2.9	2.9
k. Price controls (inputs)	2.5	N/A	N/A	2.4
l. Control of marketing	2.7	2.4	2.6	2.7
m. Tax regime	2.9	2.6	2.8	2.9
n. Security of tenure	3.0	2.8	2.9	2.8
o. Government efficiency	2.7	N/A	N/A	2.5
p. Environmental regulations	1.8	2.3	2.4	1.9
q. Host awareness	1.9	N/A	N/A	2.0
r. World Bank/IFC etc.	1.6	N/A	N/A	2.0
s. Insurance cover	1.7	1.6	1.7	2.3
t. Equity partners	0.9	N/A	N/A	1.0

NOTE: N/A = definition match not close enough.

The codes used in generating Table 2.2 for the executive survey were applied to Otto's grading as follows:

<u>Code</u>	<u>Otto's grading</u>	<u>Executive survey</u>
3	very important	major
2	important	moderate
1	not very important	minor

Weighted average calculations were then applied to the distribution of responses in Otto's table.

Allowing for some degree of variance, there were some striking correlations. The criteria relating to country political and legislative structures were considered very important in both surveys, far more so than the technical factors such as climate, infrastructure and previous country experience. There was one particular anomaly, however, where Otto's respondents viewed management control far more importantly. The exact reason for this has not been established with any certainty; it may be due to differing approaches to project management in North America versus the methods applied in developing countries.

Otto's (1992: 339) respondents were also asked to list the three most important criteria when making mining investment decisions. The five criteria mentioned most frequently were as follows:

Exploration decision

Geological potential
Political stability
Security of tenure
Mining law
Mining law stability

Mining decision

Profit potential
Political stability
Profit repatriation
Tax level/stability
Market

It was clear from both surveys that mining financiers pay considerable attention to the stability of political and legislative structures in countries being targeted for investment. These structures ultimately determine the permanency of criteria such as security of tenure, profit repatriation and taxation levels.

2.4.2 The World Bank

Staff of the World Bank (1992) have produced an extremely useful document, 'Strategy for African Mining', which covers a wide range of factors contributing to an enabling environment for mineral investment. Included as part of the assessment were the results of a mailed survey (World Bank, 1992: 16) to 80 international mining companies and, of those, 46 companies responded. Because some responses were incomplete, 40 were eventually analyzed.

Of the criteria listed, which in broad terms were similar to those discussed in the executive survey (see section 2.3.3), the overriding feature was the importance of political stability. Underlying this

basic requirement, the administrative procedures relating to security of tenure, fiscal terms and foreign exchange were major considerations. The greatest fear to investors was unpredictable change to 'the rules of the game'.

Of particular relevance also were the companies' opinions regarding rates of return and payback periods. The figures cited in the World Bank report for developing countries were 25-30 per cent and 2-4 years respectively, compared with 20 per cent and 5-6 years for the industrialized countries. These figures compare quite closely with those given for the executive survey, as shown in Table 2.5, thereby adding some support to their applicability.

2.4.3 The Mining Journal

The Mining Journal (1995a) carried out an analysis of trends in mining investment and activity world-wide. The main findings are noted below:

" According to figures from the World Bank, the level of private capital flowing into developing countries in 1994 was estimated at US\$ 173 billion, some four times the figure five years previously. Much of this investment flow has targeted East Asia and Latin America, with Africa and Eastern Europe being relatively low on investors' priority lists.

- * Approximately US\$2500 million per annum was spent on exploration world-wide, of which some 50 per cent focused on gold and 20 per cent on copper.
- * The main reason put forward for these trends was that the risk and reward equation has tipped in favour of the developing nations. All these countries have modified their policies to attract foreign investment, with mining development benefiting particularly from these changes.
- * On the subject of exploration preferences by country the Mining Journal cited the results of a questionnaire survey five years ago by the East-West Center in Hawaii. These were then compared with the results of a survey of 60 mining analysts attending a conference arranged by Miami-based International Investment Conferences (I.I.C.) in mid-1994. Table 2.7 summarizes the findings, with countries cited in both reviews being underlined.

The preferences broadly concur with those indicated in the executive survey, of note being:

- * the movement of investment away from the industrialized to the developing nations, that is, the USA, Canada and Australia have been dropped from investors' lists; and

* the risk and reward equation moving in favour of the developing world.

Table 2.7 Mining Journal survey:
Country preferences

East-West Center (Hawaii)	I.I.C. (Miami)	
Australia	Argentina	Kazakhstan
Brazil	Bolivia	<u>Mexico</u>
Botswana	<u>Brazil</u>	Peru
Canada	<u>Chile</u>	Philippines
<u>Chile</u>	<u>China</u>	Surinam
<u>China</u>	Cuba	Tanzania
<u>Indonesia</u>	Ecuador	Venezuela
<u>Mexico</u>	Ghana	Zimbabwe
Papua New Guinea	Guyana	
USA	<u>Indonesia</u>	

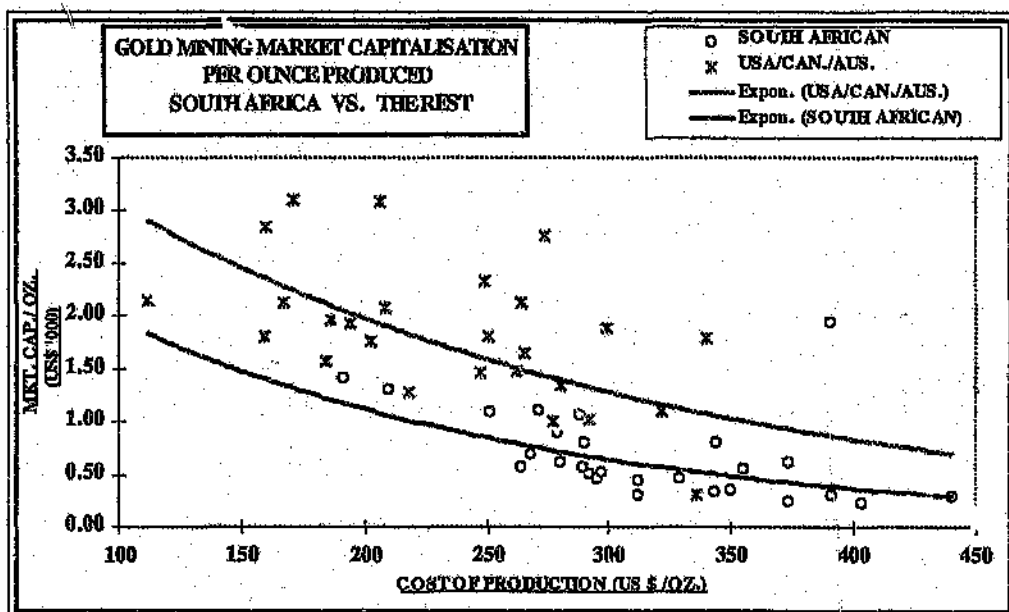
One difference was Brazil which was a preferred target together with Argentina, Chile and Peru whereas, in the executive survey, only the latter countries were attractive. The reason for this cannot be established, save to say that the I.I.C. survey reflects sentiment some nine months later than the executive survey. The executives in the survey may not have anticipated any favourable changes to Brazil's investment prospects at the time.

2.5 Stock Market Valuation of Gold Producers: A Global Comparison

One respondent in the executive survey commented that the value of gold reserves differs considerably between countries or regions (see Appendix C). It was decided to extend this theme by comparing information gathered by the Mining Journal (1995d) on major stock exchange listed gold producers based in North America, Australia, and South Africa, including Ashanti in Ghana. A graphical presentation has been provided in Figure 2.3 of market capitalization per ounce produced (MCO: Y-axis) versus production costs per ounce (X-axis), all in U.S. dollars.

In terms of analyzing the importance of operating environments the data has been divided into two groups; the South African producers on the one hand and the North American and Australian producers ('the Rest' - which include Ashanti) on the other hand. A best fit line has been generated for the two groups of scatter points. It was impractical to attach the name of producer to each data point. Appendix F provides the relevant source data should particular points need to be identified.

Figure 2.3 Gold company market capitalization in U.S. dollars per ounce produced: South Africa vs. the 'Rest'



Source of data: Mining Journal (1995d)

The differences in MCO between the South African producers (approximately 50 per cent lower) and the North American and Australian producers are just too great to be just a coincidence. The reasons for the differences can be explained in part as company specific but there are the broader issues:

- * The South African producers are 'ring-fenced', which means that any prospects for growth are confined to a well defined mining lease boundary. Most of the international producers do not have the same restrictions placed on their activities. The stock market would tend to discount the so-called 'blue

sky' (or growth prospects) for the non-S.A. producers, which then translates into a higher share price and MCO.

- * The fact that S.A. Wits basin gold mining is far deeper than elsewhere must also play a part in the evaluating the risk profiles, as would tax rates and labour productivity.
- * As has been clearly highlighted in the surveys, political and economic stability plays a major role in investors' decisions. In terms of the risk and return equation a lower price must be paid for assets with perceived volatility in earnings. Although a more sustainable direction for South Africa's political situation has been defined since the democratic elections in April 1994, the country cannot be classified as stable as the industrialized countries.

It appears that international mining finance firms should take cognizance of comparative MCO valuations as shown in Figure 2.3. The information would assist in valuing prospective mining targets and guiding the allocation of exploration and development funds. Clinically, the trend lines show that the production cost of gold purchased at a MCO of US\$1000 per ounce would be US\$225/oz in South Africa and US\$360/oz in North America and Australia.

2.6 A Summary of the Important Issues

A considerable base of opinion has been developed from the executive survey which was mostly supported by the three surveys referenced. Clearly, political events, economic policies, legislative and investment structures markedly affect the flow of mining capital towards particular countries and regions.

Technical criteria, such as geological setting, extent and concentration of mineralization, metallurgical complexity, climate and infrastructure development must also have an impact on a project's value. However, these elements do not present as great a sense of wariness in investor's minds as do the more 'political' issues.

The critical elements that seem to differentiate the socio-political from the technical criteria are the degree of stability, the transparency and predictability. The socio-political environment is primarily a legislative and administrative creation whereas the technical factors are a product of 'mother nature'. History has shown that political structures can change radically and, as a consequence, the economic and investment environment. The technical criteria, although extremely challenging at times, present a degree of permanency and predictability according to the laws of science and nature.

These principles can be demonstrated quite clearly in the cases of Chile, Indonesia and Ghana which are highly rated countries for mining investment, whereas Zaire and Angola have been ignored for decades. The latter are well known for their mineral potential; the Tenke Fungurume copper deposit in Zaire which apparently grades over 5 per cent (Brower, 1987: 23) and then Angola's diamond and other mineral occurrences (Mining Journal, 1992a: 63-65). The political situations in these two countries could be described as extremely difficult, with the dictatorship in Zaire and the continued impasse between Angola's warring factions.

The traditional areas of the USA, Canada and Australia are still attractive but not to the same degree as they were 10 - 20 years ago. The developing regions have been undergoing political and legislative changes that have tipped the risk and return equation in their favour. The results from the executive survey rate, in order of attractiveness, Latin America, then the Pacific Rim countries, then Africa. The ratings of countries within each region can vary quite widely, however, e.g. Ghana (and West Africa) versus Angola and Zaire. The former USSR and China are somewhat enigmatic to investors. There is wariness about their political histories and transitional structures but the regions cannot be ignored because of their vast geographical extent and potential.

Interestingly, many of these underlying issues were discussed in a paper presented at the Joint Meeting of the MMIJ⁴ and AIME in Tokyo as far back as 1980. Sakurai (1980: 91) actually addresses the trend prevailing at that time where most, if not all, mining activity was concentrated in Australia, North America and South Africa. The developing countries were largely ignored and the reason given by executives at the time was, pure and simply, 'political risk'. Apart from discussing in more detail the composition of political risk, i.e. unstable administration and structures, two important observations were presented:

- * Highly prospective geological areas, and even known deposits, have been left entirely alone in the developing countries (Sakurai, 1980: 93).
- * Governments of developing countries should be educated about the investment nature of the mining industry, particularly in respect of creating environments to account for the risks attached to the mining business (Sakurai, 1980: 100).

By logical deduction of Sakurai's observations it must mean that the trends being experienced currently must reflect a different political landscape because of the

⁴ The Mining and Metallurgical Institute of Japan (MMIJ) and American Institute of Mining, Metallurgical and Petroleum Engineers (AIME).

renewed activity in the 'emerging' or developing countries.

It was not practical during the executives' interviews to delve any deeper into the reasoning behind the executives' responses and opinions. Although the broader issues have been covered there were still questions as to the actual components of mining investment codes prevailing in various countries. It was decided to collate and compare the range of factors in mining investment codes of selected countries. The data would also provide the basis for a simulation framework so that the impact of various criteria on a mining project could be evaluated.

3.0 REVIEW OF SELECTED COUNTRIES' MINING INVESTMENT CODES

By inference, the surveys' show that the performance of a mining project depends to a considerable extent on the co-operation between the host country (government), on the one hand, and the providers of capital (investors) on the other hand. The motivation to initiate the development of a mining project varies considerably between each participant and some of the more important considerations have been suggested by Brower (1987: 25-28):

Host country's (government) perspective

Positives:

- Creation of foreign exchange
- Developing national infrastructure
- Development of skilled labour
- Diversification of earnings
- Prestige through economic strength

Negatives:

- Threat by powerful multi-nationals
- Reliance on hostile foreign based corporations
- Reliance on unstable commodity markets
- Creation of mining enclaves
- Distortion of domestic wage scales
- Disruption to social patterns
- Creation of crime and corruption

The investors' perspective

Positives:

- Replacement of ore reserves
- Earn higher profits on lower cost operations
- Acquire property to block competition
- Diversify into new markets
- Diversify geographic, economic and political risk

Negatives:

- Threat of nationalization
- Non-convertibility of profits
- Mineral export controls and interference
- Interference in mining operations
- Labour problems
- Imposition of new taxes
- Safety of property and employees

Although most of the considerations are self-explanatory, it becomes apparent that participants need assurances that their individual interests will be respected over the longer term. With that basic premise in mind all countries enact various laws and procedures for foreign investment, and those directed towards mineral development would be no exception. The important element, however, is the extent to which those structures are competitive and attract international investment. This is precisely the underlying theme of this research project.

Notwithstanding the above, Radetzki (1992) sees a new era of co-operation between the host governments and the foreign investor (or multi-national company). The reasoning stems from several factors; the damage caused by the nationalization era of the 1960s and 1970s, the modernization of mining investment codes and a process of privatization (reversal of the nationalization era). The demise of the former USSR was also mentioned as playing a role but the long term effects are difficult to assess with certainty. With these factors in mind the following points were raised by Radetzki:

- * The reasons (as listed above) for conflict will always be present but the mutual willingness to increase the so-called 'rents' should prevail.
- * The investment 'playing field' should level out between industrialized and developing nations and, because of the relatively unexplored and under-utilized resources in the latter, they are likely to attract a greater share of investment funds.
- * The former USSR might become a threat to other developing nations if the transition (to the CIS) proceeds swiftly and the multi-nationals' capital resources become stretched.
- * Assuming the above scenario continues on course, and new mineral sources are developed, the threat of over-supply of some commodities becomes a concern.

Theoretically, however, a market that allows economic and investment principles to operate freely should provide the mechanisms to close down inefficient capacity and re-allocate resources.

The big imponderable for investors is whether host governments will revert to nationalistic practices of the past once the profits are being generated and the long term foreign investment has been made.

These more philosophical issues provide an appropriate introduction to demonstrate the range of laws and procedures currently contained in selected mining investment codes.

3.1 Countries Selected

Five countries were selected for the evaluation because of their developing status, geographic distribution and active mining industries:

- * Latin America : Chile
- * SE Asia : Indonesia
Papua New Guinea (PNG)
- * Africa : South Africa
Zimbabwe

The intention has not been to regurgitate the 'finer print' but summarize the criteria that participants in

the mineral development business have to face in their investment deliberations. The summary should also assist in reconciling the reasoning behind the responses given in the surveys and the importance of various criteria.

The majority of the information on the selected countries has been sourced from Price Waterhouse (PW, various editions), the international auditing and management firm, who produce the series, "Doing business in ..(name of country).." . These publications are updated every few years and, depending on the date of the last edition, do strive to provide accurate current data.

Coopers and Lybrand (1991), another management and accounting firm, also produce a similar publication, 'Mining Taxation: A Global Survey'. As the last edition was produced in 1991 only back-up reference has been made due to the time that has elapsed. According to the S.A. representative office an updated edition will be available towards the end of 1995.

Other documentation has been used and reference is made where appropriate. Specific mention is made of a series of publications prepared by the Intergovernmental Working Group on the Mineral Industry (IWGMI), Canada during the period 1991-1993. The work carried out by the IWGMI was of a support nature to a government and industry task force set up after the Mines Minister's

Conference in Halifax, Nova Scotia in 1991. The task force was assigned the responsibility of reviewing Canada's international competitiveness in attracting mining investment capital.

The motivation for the IWGMI project appeared to be similar to that behind this research project. Concern was shown by government and industry in Canada that the domestic regulatory conditions were forcing mining firms to transfer more of their exploration and development efforts into the developing regions, particularly Latin America. This issue was well covered in the executive survey.

In any event the IWGMI evaluation sourced much of the mining investment code data from the accounting firms' publications mentioned above. The main achievement of the IWGMI project, however, was that an element of simplification for comparative purposes was introduced.

The following provides a summary review of the main components of the five countries' mining investment codes. More detail has been recorded in the tables and notes in Appendix G, if required.

3.2 Foreign Investment Administration

3.2.1 Procedural guidelines

Chile

Foreign investment into Chile is effected through the Foreign Investment Statute: Decree Law (DL 600) and is subject to approval by the Central Bank and the Foreign Investment Committee (FIC). A separate contract must be signed with the foreign investor and certain aspects, such as the time over which the investment is made, would be stipulated. For mining investments the maximum period allowed is 8 years, which may be extended to a maximum of 12 years to account for the exploration phase (PW, 1994a: 27, 29).

Foreign investors are allowed to own 100 per cent of a project, including the land and property components (PW, 1994a: 32). There are, however, restrictions on foreign participation in certain industries such as oil, gas and uranium. There is a choice of three business entities through which investors can operate; close corporation (not stock exchange listed), a branch office or a limited liability partnership. There are no tax advantages but the latter is the easiest to constitute (PW, op. cit.: 54).

Indonesia

Foreign mining investment into Indonesia is coordinated by the BKPM⁵ (PW, 1993: 33, 59), which is a 'one-stop'

⁵ The Investment Co-ordinating Board, Badan Koordinasi Penanaman Modal.

regulatory agency designed to streamline the permitting process.

Most foreign investment is effected through a limited liability company, the Penanaman Modal Asing (PMA). These entities may be privately owned or ownership spread through a stock exchange listing (PW, 1993: 88).

There are restrictions on foreign ownership in a venture in Indonesia (PW, 1993: 50). Usually local interests (joint venture partners) own 20 per cent initially which must be increased to 51 per cent within 20 years. 100 per cent ownership is allowed if the amount invested exceeds certain limits.

Most foreign investors in the mineral sector make use of the CoW procedure (PW, 1993: 101) which has the following attributes (IWGMI, 1993b: 5):

- * It is supported fully by legislation and usually is not subject to modification by later amendments as applied to other contracts.
- * Some terms are negotiable but other aspects, such as the fiscal regime, are set by government for the broader economy.

There have been five revisions to the first generation CoW which was issued in 1967. Table 3.1 lists the

number of CoW that have been ratified and the periods covered by each:

Table 3.1 A record of Contract of Work (CoW) agreements in Indonesia

CoW Generation	Period	Total No. of Contracts	Contracts Terminated
I	1967	1	Nil
II	1967 - 1975	15	11
III	1976 - 1984	14	8
IV	1985 - 1987	94	24
V	1987 - 1989	Nil	Nil
Frontier	1990 - 1993	17	N/A

Source: IWGMI (1993b: 5)

The period of the CoW No. V generation did not attract any new investment because the terms were not considered attractive enough because of the:

- * removal of an investment allowance,
- * less attractive depreciation rules,
- * increased dividend tax rate,
- * changed debt:equity ratio for tax purposes, and
- * dead-rent was doubled.

To improve the investment conditions once again the government introduced the 'Frontier' CoW. This CoW generation not only addressed these negative factors, but provided incentives to companies investing in remote locations, namely, Irian Jaya, Sumba Island and Timor Island. In essence the Frontier CoW recognized and alleviated the cost of development in adverse conditions.

Papua New Guinea (PNG)

All foreign investment (for mining projects) must be registered with NIDA - the National Investment and Development Authority (PW, 1990a: 31). Applications will be accepted only if the investment is directed at an activity considered to be socio-economically beneficial to the people of PNG.

There is a choice of business entity through which to operate (PW, 1990a: 47-50); branches are taxed at a higher rate than subsidiaries but the cost of setting up the latter is higher. Investors can purchase 'shelf' companies through legal or accounting firms.

There are various stages (IWGMI, 1993c: 5) which the investor has to negotiate before proceeding with a mining project. A Proposal for Development has to be approved by the authorities and provides the basis for a Mining Development Contract (MDC) between the State

and the investor or developer. There is a series of requirements attached to the MDC:

- * the funding arrangements must be approved;
- * traditional land uses must be respected by the developer.
- * the State has the right to acquire up to a 30 per cent equity stake in the project; and
- * the provincial government and the landowners (by way of a company or association) have the right to acquire up to 5 per cent of the project from the government's equity stake. A portion of this may be on a financial carry basis, that is, no investment required or is non-contributory.

A process has been introduced, aptly named the Development Forum, to facilitate wider consultation between the national and provincial governments, the landowners and the investors or developers. The issues revolve around the guaranteed distribution to the locals of the benefits accruing from the project's development. Examples of matters open for discussion;

- * loan guarantees for 'spin-off' businesses in respect of the landowner;

- * a special support grant for the provincial government set at one per cent of the product sales value less approved expenditures;
- * revised royalty distributions of a minimum 20 per cent to the landowners, with the remainder to the provincial government;
- * financial assistance for infrastructure and social improvements; and
- * prioritization of training, employment and business development, with landowners first, followed by the province's residents, then other PNG residents.

The impression gained from reviewing PNG's mining investment regulations was that the procedures were far more involved because of the various interest groups. Relative to many other countries these complications were likely to encourage delays and litigation, thereby adding significant costs to the investment process.

South Africa

Foreign investment into S.A. requires approval by the exchange control authorities (PW, 1994b: 52). There is a preference for investment by way of equity (shares) rather than loans (see loan restrictions later). The usual form of business entity is the public or private limited liability company (PW, 1994b: 83).

A further choice would be a branch of the foreign company (PW, 1994b: 99). The main benefit of the branch office is that any losses incurred may be offset for tax purposes against the income from other sources within South Africa.

There are no major restrictions on foreign ownership in S.A. entities.

Zimbabwe

Foreign investment is regulated by the Reserve Bank via the Investment Centre (PW, 1990b: 34). The overall authority, however, rests with the Ministry of Finance, Economic Planning and Development.

The Zimbabwe investment code does not stipulate that foreign investors have to develop mining projects with local entities (PW, 1990b: 39). Although this may be the stated intent, the authorities would prefer to see Zimbabwean shareholder participation over time. The essence of the regulations is that there is a degree of negotiation attached, depending on the circumstances.

A business can be set up either through a local subsidiary or a branch office. Most foreign investors operate through a locally incorporated subsidiary, mostly because of taxation benefits and it indicates a

more 'permanent' presence (authorities' preference) than the branch office approach.

3.2.2 Currency exchange controls

One criterion that the surveys and published documentation were very clear about was investors' access to foreign exchange, specifically in respect of:

- * repatriation of capital,
- * remittances of profits or dividends on the original investment,
- * payment of goods and services to operate the mining project and last, but certainly not least,
- * redemption of any loan principal and interest, if applicable.

The important issue is investors' freedom to decide the movement of currency so that resources are allocated efficiently, timeously and without encumbrances. The situation prevailing in the five countries is summarized:

Chile

All foreign exchange transactions are carried out through the Central Bank (PW, 1994a: 29-30) which

issues a non-transferable registration certificate. The certificate authorizes the entry and export of capital, including the transfer of interest and profits. Other elements relating to foreign investment (IWGMI, 1993a: 5):

- * Currency for the payment of imports is allowed through the foreign exchange market as administered by the Central Bank.
- * Export proceeds must be re-patriated within 120 days and liquidated in the formal market by a commercial bank within 11 days.
- * Foreign capital may be repatriated after one year (prior to 31 March 1993 this period was three years), but only with the proceeds from the sale of the investment, net of any tax liabilities, before being approved by the FIC (Foreign Investment Committee).
- * Generally, foreign investment is subject to the same legislation as local investment and no discrimination is permitted.

Indonesia

The foreign exchange rules allow investors to move funds freely to and from the country. Some examples of the transactions would be (PW, 1993: 49):

- * net operating profits in proportion to the shareholding of the foreign investor;
- * sales of shares owned by the foreign entity provided they are sold to Indonesian entities or nationals;
- * loan principal, interest payments and royalties insofar as they have been intended for the investment approved by the authorities;
- * payment for costs of foreign personnel and the training of Indonesians overseas; and
- * full compensation should the company be nationalized at a later stage.

Papua New Guinea

All foreign exchange transactions are administered by the Reserve Bank of PNG (PW, 1990a: 25-29) and most are normally approved. Some examples would comprise:

- * repatriation of capital to non-residents;
- * foreign capital flows;
- * proceeds from exports, which must be returned to PNG, net of amounts required to cover the next three months' expenditures for the proper functioning of

the project; the calculation being carried out on a continuous basis (IWGMI, 1993c: 6); and

- * the registering of shares in the hands of non-residents.

Tax clearance certificates are required by the Central Bank before proceeds related to the following can be transferred from PNG:

- * debt funding,
- * capital transactions, such as sale or purchase of shares, equipment and land or property,
- * royalties, management and licence fees,
- * non-resident trust funds, and
- * dividend or interest payments to non-residents.

South Africa

Until March 1995, the significant feature of the South African currency exchange system was the dual currency (PW, 1994b: 50); the financial rand and the commercial rand. The financial rand was the mechanism through which capital investments were made (and repatriated), set by the prevailing U.S. dollar rate and according to supply and demand conditions at the time. All other transactions such as proceeds from exports, payment for the importation of goods and services and the purchase of foreign exchange for travel were subject to the commercial rand rate.

The financial rand always traded at a discount to the commercial rand and was extremely volatile at times, varying between 10 and 40 per cent according to investor sentiment about conditions in the country. The two-tier system was scrapped early in 1995 and all currency transactions now take place through the so-called 'unitary' rand.

There are very few restrictions imposed on foreign investors on the flow of their investment funds (PW, 1994b: 55). The important issue for South Africa currently is to attract those funds for long term, permanent investment and development. As has been established in the executive surveys there is fierce competition in the global market place for scarce investment capital; and it will flow to wherever the risk and return balance is favourable.

Zimbabwe

Until 1990 the Zimbabwean economy was highly regulated and the movement of foreign exchange severely restricted (Edwards and Co, 1994). At that time the World Bank and Zimbabwe agreed to work together on an economic structural adjustment programme (ESAP) over a five year period.

One of the benefits of the ESAP was that, since mid-1993, there had been a significant relaxation of

exchange controls. Administration of the process, however, is still vested in the Reserve (Central) Bank. For purposes of illustration, some of the previous restrictions included the following (PW, 1990b: 35-39):

- * Foreign investors were allowed to repatriate only 50 per cent of after-tax profits; the remainder had to be paid into a Blocked Account with a registered bank and overseen by the Reserve Bank.
- * Mining investors were subject to the same 50 per cent ruling but this could be negotiated on merit (IWGMI, 1993e: 6).
- * Strict control was maintained on importation of goods and services, and this severely restricted proper maintenance of production facilities and the ability to perform competitively.

Since the relaxation in foreign investment procedures, Zimbabwe has been experiencing a marked increase in business activity, including mining exploration and development. Zimbabwe provides a good example of the benefits resulting from the lifting of such restrictions.

3.2.3 Restrictions on use of loans

There can be restrictions on the usage of loans by foreign investors, including the level of debt relative to equity (the debt:equity ratio).

Chile

Loans have to be approved and registered with the Central Bank. Applications are usually successful provided the repayment terms (and interest rates) are market related.

In order to reduce the inflow of foreign loans, a ruling has been in force whereby 30 per cent of the principal must be deposited in a non-interest bearing account for one year (PW, 1994a: 30, 41). The alternative is to pay the Central Bank the interest equivalent to the one year LIBOR (London Inter-bank Offered Rate) plus a 4 per cent premium.

There appear to be no other restrictions on loan usage by foreign investors, save to say that it is apparently more expensive to raise loan capital in Chile than offshore.

Indonesia

There are no restrictions on loan financing (PW, 1993: 38, 143) except that the Central Bank maintains a discretionary stance - which probably amounts to

control. Reportedly there have been some limits attached to previous CoW (Contracts of Work).

Papua New Guinea

The Central Bank imposes a maximum limit of 3:1 debt:equity for a foreign investment (PW, 1990a: 27, 42). There is also a period of one year imposed before instalments on the principal can be repaid. For foreign investors operating a local company a debt:equity restriction of 2:1 is enforced. These rules are imposed so that the foreign investor commits a majority proportion of equity capital. No restrictions on overseas borrowing are imposed on companies engaged in mineral exploration.

South Africa

The Reserve Bank prefers foreign investment to be effected through equity rather than loans (PW, 1994b: 52-54). Exceptions to the rule would be considered if there is enough permanent capital to cover all liabilities.

As far as local borrowings to foreign investors are concerned stringent rules have been laid down. The terms are quite intricate but, in general, the Reserve Bank limits a 100 per cent foreign owned company to loan funding amounting to 50 per cent of the foreign capital invested.

Zimbabwe

The terms of foreign loans are negotiated when the investment is approved by the Reserve Bank. There are restrictions on the amount a foreign investor may borrow, specifically if foreign ownership of the company exceeds 25 per cent. A formula is applied in determining the borrowing limit (PW, 1990b: 51-52).

3.3 Security of Tenure for Mining

As has been indicated in the surveys (section 2.0), investors are extremely sensitive about long term security of tenure. The scope of the subject is immense and a full discussion would be impossible in the context of the theme of the research project. Nevertheless, to the extent that secure title supports the stability and value of a mining investment, an overview of the five countries' codes would be informative.

The World Bank (1992: 69) provides a useful summary of the relevant tenure codes and procedures applicable to Chile, Indonesia and Papua New Guinea. Various other sources have been used for the situation prevailing in South Africa and Zimbabwe.

Chile

All mineral rights are vested in the State and the administration of mining and related activities is divided into three phases:

Prospecting Licence: Exploration rights are open to any person or entity on any land not already covered by other mining related licences. Compensation to landowners is expected, however.

Exploration Concession: This restricts activity to a demarcated area not exceeding 5000 hectares. The Concession is renewable only once after a period of two years and for an area half the original size.

Production Concession: Only a holder of an Exploration Concession may apply for a Production Concession. The maximum area permitted is 10 hectares. There are no limits to the number of concessions held, provided all the relevant annual fees and liabilities have been settled.

Indonesia

All minerals' ownership is vested in the State, with all administration and conditions of extraction stipulated in detail within the Contract of Work (CoW - as described above). Although the CoW is a detailed document, investors have been secure in the knowledge that historically the government has respected the

conditions therein. A further positive factor to the procedure is that the CoW offers the concept of 'one-stop' administration, thereby reducing inter-departmental bureaucratic inefficiencies and time delays. Security of title for mining activities is divided into five phases:

General Survey Concession: This encompasses prospecting activities and is valid for one year, and can be renewed for one more year. The usual area under reserve is 25 000 hectares but can be enlarged under CoW agreement. Expenditure of the order of US\$45 per hectare is stipulated. Priority is given to the holder to apply for an Exploration Licence.

Exploration Licence: This provides the right to explore for minerals in a reduced area for a period of three years, and includes the right to mine if an economic deposit is delineated. The Licence stipulates a minimum expenditure of US\$450 per hectare and detailed reporting procedures.

Feasibility Stage: The period allowed is one year, to be extended for one more year if required, and follows on from the exploration phase automatically.

The project moves into the **Construction Stage** as a natural consequence and the period (usually three years) that was negotiated and agreed upon has to be met. The **Production Stage** is normally granted an

operating period of up to 30 years but this can be extended as appropriate.

Price Waterhouse (PW, 1993: 102-103) mention the above phases but also note that the exploitation of minerals is regulated by mining authorizations, kuasa pertambangan (KP). Foreigners are not permitted to hold KP and would have to negotiate with Indonesian entities and then the government to participate in a CoW. A PMA (see 3.2.1) entity is set up to sign and take responsibility for the CoW.

Papua New Guinea

As in the case of Chile and Indonesia, ownership of minerals is vested in the State. The basic procedural guidelines for doing business in PNG have been discussed above but, of specific relevance to mining, the following stages are recognized:

Prospecting Authority: This gives the holder the right to explore for gold, or specified minerals, for two years in an area not exceeding 25 000 square kilometres. An unlimited number of two year extensions to the initial period are allowed provided the area is reduced by 50 per cent each time, to a minimum of 250 sq. km. Annual fees are payable by the holder.

Mining Leases: Although the usual authority granted is the Special Mining Lease (SML) there are the Gold

Mining Lease and the Mineral Lease agreements. Title may not be transferred without the consent of the responsible Minister. The process for the issuing of the relevant Lease is contained within the Mining Development Agreement (Contract) which has been discussed above (section 3.2.1 - PNG).

South Africa

The S.A. mining title code is quite different to many other countries because mineral rights can be privately owned, as opposed to being vested in the State. In consequence to the political transitions that have taken place in S.A. there has been considerable debate about the effectiveness of this system. The main issues which have been under scrutiny are noted (Kruger and de Wit, 1987: 10-11):

- * The mineral rights can be held indefinitely with very little cost to the holder, thereby increasing the chances of sterilizing the land from exploration and development.
- * There is a problem with 'fragmentation' of mineral rights where tracing all the owners becomes extremely time consuming, let alone the difficulty in reaching an agreement (see also von Below, 1990: 314).

Various proposals have been put forward and mainly revolve around ways to transfer the private ownership of mineral rights back to the State. The major problem with this is that the system, which has evolved over a period of some 100 years, will be extremely difficult to reverse equitably (Segal, 1994). Significant funds have been spent on exploration and acquisitions so that a sound basis for subsequent valuation and compensation would be extremely complicated.

Nevertheless, as Segal points out, the effectiveness of the regulatory and permitting procedures should be given more credit. Notwithstanding the above areas of difficulty, the right to prospect, and to mine, can still only be authorized by the State. After all, the S.A. mining industry has worked and generated enormous wealth for the region; the underlying system cannot all be bad.

The very basic elements of the permitting procedure are noted (Minerals Bill, 1991):

The prospecting permit: Upon lodging the appropriate documentation concerning mineral right ownership and proper conduct while prospecting, authorization is given to prospect for a period of twelve months. At the discretion of the respective authority this period can be extended on written application within a month of expiry.

The mining authorization: Upon submission of detailed documentation pertaining to the method of extraction, funding and rehabilitation of a mineral bearing area, an authorization to mine is issued.

The critical factor in S.A. currently is the appropriate system for the future, but extreme care must be given to counting the costs and benefits by changing the status quo. Drawing on the findings of the surveys and the literature, investors loathe uncertainty and the potential for drastic change. Unfortunately, this is precisely the factor that the indecision and acrimonious debate on S.A. mineral tenure is likely to instil in the minds of investors.

As has been highlighted previously many other developing countries are attracting the attention of mining investors. It appears that the challenge is not only from within but also from outside competition. Investment funding will flow to where the risks and rewards are considered favourable; the simulation framework implicitly addresses this fundamental principle.

Zimbabwe

All rights to minerals in Zimbabwe are vested in the State, similar to the situation in many countries. The State maintains control (in the positive sense) of exploration and mining activities through a claim

staking procedure which is administered by the respective Mining Commissioners. Ownership to the claims is perpetuated by the issue of an annual inspection certificate from the Commissioner (Kruger and de Wit, op. cit.: 14).

Another facility, the Exclusive Prospecting Order (EPO), can be issued to individuals or corporations in respect of the prospecting of large areas. In this case the government becomes involved and ratifies the terms of the programme to the satisfaction of the Mining Affairs Board.

The system appears to have worked well for many years, having been retained by the new government after independence in 1980.

3 Fiscal Regime

One of the most important aspects that must be considered by any investor is the level of taxation applied to corporate earnings. The salient components of the fiscal regimes pertaining to the five selected countries are summarized below.

3.4.1 Production royalties

Of the five selected countries, Indonesia and Papua New Guinea levy production-type royalties. Further details

are provided in Appendix G under the respective countries, but some brief comments:

- * Indonesia's royalty on gold and copper sales is formula based (IWGMI, 1993b: 20) and ranges between 1.5 - 3.5 per cent of sales of copper and from 1.0 - 2.0 per cent on gold sales.
- * Until recently PNG's royalty was a flat 1.25 per cent of sales value (Coopers & Lybrand, 1991: 75) ; (IWGMI, 1993c: 21) but the Mining Journal (1995b) reports that this is to be increased to 2.0 per cent, although adjustments to other criteria are to be made as well (see corporate tax below).
- * PNG also levies a royalty of 5 per cent on alluvial gold sales (Coopers & Lybrand, 1991: 75) ; (IWGMI, 1993c: 22).

Kumar (1991: 137) discusses some of the implications attached to this type of royalty. Generally, it is not a popular tax with the investor, especially the revenue-based version, because it favours the very profitable operation. The marginal or low profit operation may not have sufficient funds to pay the royalty. The World Bank (1992: 28) also comments that profit-based taxes are far more preferable to the revenue-based royalty.

The impact of the royalty is covered later in section 5.0 in the discussion of the results from the simulation framework.

3.4.2 Corporate taxation

The different levels of corporate taxation for each of the five countries are described briefly below. Further details have been provided in Appendix G.

Chile

A First Category Tax of 15 per cent is applied to accrued taxable income from mining businesses. A Secondary Tax (or Additional Tax) of 35 per cent is levied when any profits are remitted abroad. In this instance the first tax would be credited against the Secondary Tax and the effective tax rate would then amount to 35 per cent (PW, 1994a: 89, 125).

Indonesia

Corporate profits are taxed at the top rate of 35 per cent (PW, 1993: 138).

Papua New Guinea

Corporate profits are taxed at the top marginal rate of 35 per cent (PW, 1990a: 157). The Mining Journal (1995b) reports that the PNG government has proposed that this rate be reduced to 25 per cent. Adjustments have also been mooted, however, to the production royalty (from 1.25 to 2.0 per cent) and landowner

carried interest (5,0 per cent), negating to some extent the benefits of the tax reduction.

South Africa

Gold mines' profits are taxed according to a formula whereas other companies are taxed at a rate of 35 per cent plus a Secondary Tax on Companies (STC) of 25 per cent on dividends paid to shareholders.

The current formula tax for gold mines which have not opted for the STC format (PW, 1994b: 180):

$$Y = 58 - 290/X \quad \text{where;}$$

Y is the percentage applied to taxable income, and X (P/R) which is the taxable income (P) divided by total revenue (R), written as a percentage.

The formula works on a sliding scale where the more profitable mines pay a higher percentage of taxable income. Dividend payments to shareholders by most gold mining companies are not subject to the STC.

Non-mining profits earned by gold mines, such as interest from cash balances invested, are taxed at a rate of 48 per cent.

Zimbabwe

The general tax rate on corporate profits was reduced from 42,5 per cent to 37,5 per cent as from 1st April 1995 (Deloitte & Touche, 1994: 2, 24) ; (PW, 1990b: 120). Unfortunately for mining companies this benefit was largely negated by the removal of a 5 p ' cent depletion allowance (see below). A branch office of a foreign company is subject to an additional 8,4 per cent tax liability, resulting in a total effective tax rate of 45,9 per cent.

3.4.3 Additional profits tax (APT)

Of the five countries reviewed only Papua New Guinea levies an APT, sometimes referred to as a 'windfall' tax. Kumar (1991: 144) describes the terms attached to the APT in more detail and the probability of the tax coming into effect appears to be quite low. The APT is calculated on the basis of an accumulated return on capital invested, the thresh-hold rate being based on a 12 per cent premium to the U.S. prime rate or a flat 20 per cent (PW, 1990a: 108). In other words, the initial amount of capital invested is netted off progressively against annual net earnings discounted by the thresh-hold rate until exceeded by the latter. The excess amount is then taxed at a rate of 70 per cent less the prevailing corporate tax rate (35 per cent at present).

The APT can be a disincentive (World Bank, 1992: 33) because investors believe that mineral development is a very risky business and they should be entitled to the

full rewards. If the APT is to be considered at all by government authorities it should be by those countries with a track record of quality projects and highly prospective geology.

3.4.4 Investment recovery period (IRP)

Papua New Guinea is the only country (of the five under review) which specifically recognizes a tax holiday to shorten the payback period for investors, i.e. the investment recovery period (PW, 1990a: 108)⁶. During the IRP, capital expenditure can be written-off against taxable income faster than would ordinarily be the case under the normal depreciation rules (see below 3.4.7). This reduces the tax payable, thereby increasing investors' earnings, which in turn shortens the payback period needed to recover the original investment.

Once the capital expenditure has been recouped then the calculation for the additional profits tax commences, which has been discussed previously.

3.4.5 Loss carry forward period

The period allowed for the carry-forward of tax losses to be off-set against future profits varies from country to country (PW, reference pages as shown):

⁶ Coopers and Lybrand (1991: 73-74) mention the IRP but the terms are more complex than those given by Price Waterhouse. IWGMI (1993c: 15-16) give similar terms to Coopers and Lybrand.

Chile	:	Indefinite	(1994a: 96)
Indonesia	:	8 years	(1993: 146)
PNG	:	7 years	(1990a: 101)
South Africa	:	Indefinite	(1994b: 172)
Zimbabwe	:	Indefinite	(1990b: 120)

There are no allowances for carry-back of losses in the above countries. Kumar (1991: 142-143) notes that this privilege applies to projects in Canada and the USA for a three year period, and the UK for one year.

In South Africa an allowance of 12 per cent per annum on all unredeemed balances of capital expenditure is given to new mines until taxation first becomes payable (van Blerck, 1992). This provision was introduced to counter the effects of inflation which would otherwise shorten the tax 'holiday' period, i.e. unredeemed balances in previous years' money terms being off-set against taxable income in later years' escalated terms.

3.4.6 With-holding taxes

With-holding taxes are levied in many countries on various categories of income remitted to foreign investors; on dividends, interest on loans, royalty payments and management or service fees. The levels imposed are variable and can be quite high in some cases, thereby acting as a disincentive to many investors to repatriate certain categories of income. Details of the various with-holding taxes for the five

countries have been provided in the tables and notes under Appendix G.

The view of the host government might be that foreign investors should re-invest their earnings in the country of origin (Kumar, 1991: 145-146). The problem with this is that the foreign investor may not see the particular country the same way because there may be numerous alternate avenues for investment. It should be appreciated that investment information flows faster around the world, and in a more structured format, than ever before.

There are usually double taxation agreements between countries so that income remitted abroad is not taxed twice.

3.4.7 Depreciation for tax purposes

The rate at which companies are allowed to 'write-off' capital expenditure against taxable income is an important (dis)incentive. The faster the rate at which capital expenditure can be written off the lower the amount of tax payable. The provision can also alter the amount of tax losses carried forward, thereby lengthening the period before tax becomes payable.

The levels of depreciation and methods applied can be highly variable between countries. The details in respect of each of the five countries have been

provided in Appendix G, together with explanatory notes where necessary.

3.4.8 Value added tax (VAT) or GST

For the countries under review there were two forms of consumption type tax levied, namely; the value added tax (VAT) and/or general sales tax (GST).

Only Zimbabwe levies GST on goods and services, and to some extent Papua New Guinea where sales tax is administered at the provincial level. Chile, Indonesia and South Africa have adopted the VAT system and, as applied to exports, is zero rated. This means that the VAT paid on goods and services (inputs) can be reclaimed because there is no VAT paid on the exported product.

3.4.9 Sundry duties

There are numerous other smaller duties and types of tax imposed, for example, stamp duties on cheques and legal documents, company formation expenses, capital taxes and transfer taxes on property. These were found to be extremely variable and details have been provided in Appendix G where practicable. These levies have not been included in the simulating framework (see section 4.0 later) because of their variability and appear relatively small in the context of a mining project's life cash flows. Kumar (1991: 137) alludes to this by

commenting that countries place most emphasis on royalties, corporate tax, additional profits tax and with-holding tax.

3.5 Social Security Payments

Most countries legislate some form of social security responsibility for employers in respect of employees:

Chile

Employers are required to cover an accident and death insurance ranging between 0.9 to 3.4 per cent of salary. The amount varies according to the degree of job risk.

Any training costs up to a maximum of one per cent of annual salary are allowed as a credit against the First Category Tax (PW, 1994a: 97).

Only employees contribute 10 per cent of taxable salary to a pension fund, up to a maximum of 60 development units monthly; Ch\$654 000 = approx. US\$1635 as of May 1994 (PW, 1994a: 61-62). Employees are also required to contribute 7 per cent of salary to medical cover and 3.3 per cent for death and disability coverage.

Indonesia

Employers with a labour complement of more than 10 persons participate in the Worker's Social Insurance Program (ASTEK). There are three components to the scheme (PW, 1993: 109-110):

Accident insurance: Paid by the employer and ranges between 0.24 and 3.6 per cent of the employee's basic salary.

Retirement (pension): Contribution of 2.5 per cent of salary; comprising 1.5 per cent from the employer and 1.0 per cent from the employee.

Death insurance: Paid by the company at 0.5 per cent of the employee's basic salary.

Papua New Guinea

Companies employing 25 or more staff have to register with the National Provident Fund. Membership is compulsory for employees working more than 59 days in a three month period. Employers must contribute 7 per cent of gross salary and employees a minimum of 5 per cent, and up to 10 per cent on a voluntary basis (PW, 1990a: 63) ; (IWGMI, 1993c: 24).

Foreign companies have to submit a training programme to the Labour Department and should include reasons for employing expatriate staff and proposals for training local personnel (PW, 1990a: 61). 500 kina is payable by

the employer for each expatriate employee. A training levy of 2 per cent of taxable salary is payable by employers with payrolls over specified amounts (INGMT, 1993c: 25).

South Africa

There is a limited government administered social security system. Companies and individuals must make provision for pensions and retirement. Normally the employee and employer would each contribute approximately 5 per cent of gross salary (PW, 1994b: 107-108).

Companies also contribute to medical aid schemes for employees and the amount can vary quite widely. On average the employer would contribute approximately 6 per cent of gross salary, and the employee a similar amount.

Unemployment insurance contributions are payable by the employer and employee at a rate of one per cent of salary each, in respect of employees earning less than R58 188 per annum.

Zimbabwe

Most companies organize a pension scheme, either managed by themselves or a financial institution. The employer and employee each contribute approximately 6

per cent of gross salary. Medical aid contributions are also payable by both employer and employee (PW, 1990b: 71).

3.6 Employees' Share of Profits

Profit share schemes are generally implemented at the discretion of the company. Chile, however, stipulates specific guidelines for a minimum profit share arrangement. The following paragraph from PW (1993: 58) explains the terms:

' the law provides that companies must distribute 30 per cent of profits to workers. The basis used to determine the percentage is taxable income less 10 per cent of net equity. However, if the employer pays a bonus of 25 per cent of the yearly income, up to a maximum of 4.75 monthly minimum wages (1994: CH\$247 000 = approx. US\$525), the profit sharing obligation disappears'.

It would seem that the employer pays a profit share bonus using whichever arrangement proves the least costly.

3.7 The Mineral Development Agreement

The executive survey, the referenced surveys and the summaries of country investment codes have demonstrated the range of criteria associated with international mineral development. Considering the complexities and the large sums of capital usually involved in the development of a mining project, all participants (both governments and investors) are likely to be extremely cautious in their dealings. These sentiments would apply particularly in respect of the developing countries where a previous track record of mining investment may be non-existent.

The underlying issues investors are the stability of the operating environment for the duration of the project and the distribution of the benefits that will accrue. To minimize the chance of abrogation of the conditions of development and investment, a mineral development agreement (MDA) would be drawn up. The various forms of this document have been mentioned above, such as the Contract of Work (CoW) in Indonesia and the Mineral Development Contract (MDC) in PNG.

The MDA is likely to be a complex and lengthy document which would need a separate research effort to cover adequately. However, in the context of this particular assessment, the point of emphasis is that negotiation between the participants and contractual documentation is a very necessary part of the mineral investment process.

For illustration purposes, Otto and MacDougall (1994) discuss the MDA and highlight its importance in respect of the project financing arrangements. Project financing packages usually involve several parties ranging from equity and debt investors, to product consumers, to engineering service and equipment suppliers. It would be essential for project participants to obtain guarantees of conditions for payment of interest on loans, profits (returns) and settlement of project operating and capital costs. As most of the country criteria summarized above would have an impact on cash flows, they would need to be specified in the MDA. It is also likely that the host country (represented by the government) would be a signatory. Some important areas that would have to be addressed in the MDA:

Nationalization: Guarantees against expropriation of assets and for compensation should this occur.

Provisions for default: Lenders would need procedural clauses in the event of default on payment of loan interest and principal.

Product marketing: Investors regard government interference in the marketing of minerals as contrary to competitive sales practices.

Settlement of disputes: Foreign investors may be unfamiliar with local laws and, in the event of

disagreement, would prefer access to international arbitration, e.g. ICSID - the International Centre for the Settlement of Investment Disputes - which is affiliated to the World Bank.

Environmental factors: Environmental issues need to be stipulated from the point of view of estimating initial capital costs and determining liabilities during the project's life. The distribution of liabilities between the venture partners needs to be clearly determined.

Otto and MacDougall make the point that, even if the terms of agreement are not particularly favourable in relative terms, at least they should be rigidly enacted and steadfastly supported by a stable, credible legal framework.

Brower (1987: 47) addresses many of the issues mentioned by Otto and McDougall but also highlights the project's infrastructure requirements. Relevant to this heading would be, housing, rail and road links, power and water supplies, waste disposal and even an airport. If the project locality has very little previous infrastructure development, the costs of starting from 'scratch' may totally negate the returns on the single project. Clearly, the primary consideration for all participants would be to reconcile the infrastructure costs with the benefits likely to accrue, not only to the mining project, but to the region as a whole.

4.0 COUNTRY CRITERIA SIMULATION MODEL

4.1 Risks and Returns: Some Theory

The assessment thus far has shown the range of criteria to be considered when making international mining investment decisions. This would include an appreciation of the longer term repercussions from mega-political events, such as the collapse of the former USSR. Furthermore, the combinations and permutations of criteria associated with different mining projects would be endless.

Intuition and experience can provide an investor, engineer, manager or financier, a good "feel" for the probability of success, including the risks and the value attached to a mining project. Even so, the primary motivation underlying the decision-making process would be to achieve the greatest return on investment, suitably adjusted for the perceived or measured risks. Ultimately these returns would be supported by the future earnings (cash flows) generated by the project (Stern, 1977). The degree to which these earnings are assured would be a function of the stability of the operating environment, comprising the range of criteria under discussion in the executive survey and summarized in section 3.0.

In order to reconcile the concepts of risk and return, the issues raised in the surveys and the five

countries' investment codes, a calculating framework was developed to simulate the cash flow (investment) performance of a gold mining project in each country.

Before discussing the components of the simulation framework it would be appropriate to revise some theory on the risk and return relationship and, for this purpose, the Capital Asset Pricing Model (CAPM) has been used. Franks and Broyles (1979: 107), after the work of Sharpe (1964), Lintner (1965) and Mossin (1966), provide an overview of the CAPM, which can be written in the following form:

$$E(R) = R_f + (E(R_m) - R_f)B \quad \text{where:}$$

- $E(R)$: the expected return on investment.
- R_f : the risk-free rate of return (e.g. U.S. government stock).
- $E(R_m)$: the expected return on a specific market portfolio or security (stock, share)
- B : the beta coefficient which measures the risk attached to the investment relative to that of the market.

The important issue demonstrated by the CAPM is that the return on an investment comprises a risk-free return (say, 5 per cent) plus an expected excess return over the risk-free rate (say, 10 per cent), the latter being adjusted for risk as measured by the relative volatility (beta) of the investment. Assuming a beta

value of 1.10 for a particular investment then the total return would be 16 per cent.

The beta value can range above and below 1.0 and reflects the volatility of an investment's return relative to that of a comparative market portfolio of investments. If the beta is less than 1.0 the investment's excess return is less than the market portfolio and, if more than 1.0, then the expected return would be greater than the portfolio. In the numerical example above, if the beta value was 2.0 then the total return would be 25 per cent.

It is also important to appreciate that value and return on investment are relative concepts; there are always alternatives to consider when making any investment decision. A relevant situation to the research topic would be an investor's decision whether to invest in a "risk-free" U.S. government bond earning a safe, guaranteed return or whether to invest in a mining project in Chile or even in Zaire or Zambia.

Petrick (1985: 247), after the work of Lessard and Graham in 1976, breaks down the overall risk (the beta factor) in a mineral project into the broader underlying risks. A further classification has been made as to whether the individual risks are 'systematic', i.e. common factors to all risky investments, or 'unsystematic' which are unique to the project. Some examples are noted:

Mineral reserve risks: A function of the individual ore-bodies and would not be related to the economic or market behaviour; an unsystematic risk.

Development risks: Mostly specific to the project, such as timing of development and cost overruns which are largely unsystematic.

Operating risks: Parameters such as equipment failure, resulting in additional costs, would be unsystematic risks. On the other hand, labour disruptions (strikes) may be systematic risks because they could be related to general economic conditions.

Market (commodity) risks: Reflect the possibility of being unable to sell total output and unexpected changes in price. Generally considered systematic in nature because of the relationship to overall economic conditions.

Political (country) risk: The actions of the government would affect project earnings or cash flows to varying degrees (as per the theme of this research effort). It is arguably the most unpredictable of the risk elements described. This type of risk, although not clearly discernible as 'systematic' or 'unsystematic', would probably be considered unique to a (mineral) project.

Davis (1995) has added some useful perspective to the application of discount rates for net present value (NPV) determination, the treatment of risk and the (mis-)use of Monte Carlo (stochastic) simulation. Attention is drawn to the common application of arbitrary discount rates to account for risk, for example, the higher the discount rate, the higher the perceived risk and the lower would be the resultant NPV.

The issue that Davis highlights is that the same result could be achieved by reducing a parameter (e.g. milled tonnes throughput) because of, for example, persistent labour problems. Davis cautions against confusion of these concepts and, for purposes of demonstration, compares a hypothetical PNG gold mine with an identical mine situated in Nevada (USA).

In view of the above complexities, and in terms of the simulation framework, there are limits to the quantification of countries' mining investment codes and environments. Battman (1995) highlights this issue in an excerpt from an article written for the Mining Journal:

"There is, unfortunately, no simple methodology which will adequately assess risks and make forecasts. Assessing political and security risks is more of an art than a science. While quantitative approaches are useful, notably for economic analysis, the analyst must

be the final arbiter, not the computer. But some order must be introduced into the process." (PSA underline)

The simulation framework has been developed to achieve exactly this and take out as much of the 'guess-work' as possible. An additional objective has been to provide a means to think through the dimensions in decision making in international mining investment, which include some of the theory in mineral economics. Throughout any evaluation process, however, the concepts of stability and variability in earnings (or returns) should be kept in mind continuously by the investor or analyst.

4.2 Components of the Simulation Model

An important facility which has enabled the development of the simulation framework is the personal computer based technology and its flexibility and "user friendliness" (for the resource engineer). Microsoft Corporation's spreadsheet programme Excel 5.0 for Windows was used extensively. Essentially, these tools enable an aspiring professional in a particular field of endeavour to project his or her knowledge and experience into a fast calculating medium without also having to become a computer programming expert beforehand.

The three broad elements that would play an important role in the performance of any mining project or investment are:

- * the technical and operating characteristics of the particular project;
- * the host country's mining investment codes; and
- * the macro-economic environment (global and local), including the commodity markets.

In order to incorporate all these elements, a modular calculating structure has been developed and comprises the following:

- * Project module
- * Country criteria module
- * Simulation module

The details of the modules and their composition are described below.

4.2.1 The project module

The project module comprises the production, revenue, operating and capital expenditure parameters for the mining project which, for purposes of the analysis, have been based on a convenient, average-sized Wits

gold mining project (discussed below). In essence, the module represents a hypothetical or 'test' project which can be 'transported' into any country environment, the latter comprising the country criteria module and the simulation module.

Although the S.A. gold mining industry has provided a basis for the project parameters, the latter have been simplified so that analyzing the impact of changes to various criteria was made more manageable. The main focus has been to contemporaneously simulate the investment environment of the different countries and not the project technical details explicitly.

The components of the project module have been displayed in the printout Appendix H. For purposes of global standardization, the project module cash flows have been calculated in U.S. dollar terms, converted to the currency of the particular country in the simulation module, then back to U.S. dollars to compare and analyze the results.

The principal components of the project module and the assumptions made are presented below:

U.S. inflation rate

This has been based on U.S. price index data over the last few years (IMF, 1995) and forecast to average 3 per cent per annum over the life of the operation.

U.S. interest rates on loans

The interest rates applied to the loan financing have been based on the long term U.S. inflation rate plus an arbitrary variable premium. For example, a 10 per cent interest rate would comprise a 7 per cent real interest rate added to the 3 per cent inflation rate. In the project module the loan rates have been included as a variable input so that each lender's assessment of the risk profiles can be accommodated.

Commodity prices

A long term average gold price of U.S. \$ 380 per ounce (1995 money terms) has been assumed for the base case scenario.

Technical characteristics of the mining project

The technical attributes of the 'test' mining project have been based on a convenient sized Witwatersrand gold mine (COM, 1994), primarily because the public reporting of the operating results is adequately detailed and confidentiality problems reduced.

Consideration was given to basing the test project on a Chilean or Indonesian copper-gold producer, but was not pursued because the objective of the study was to focus on and compare country investment environments. The

simulation model would have become unnecessarily involved with the more complex technical attributes of such mining projects, such as smelting and refining logistics and transport economics for the higher bulk:low value commodities, i.e. copper concentrates.

Life-of-mine: The life of the operation has been assumed to be 20 years, inclusive of a 3-4 year period to self-financing status. The build-up and end-of-life production profiles have been displayed in Appendix H.

Ore grades: The recovered gold grade over the life of the operation was forecast at a convenient 10 grammes per tonne of ore. This would be considered a high grade operation in South Africa, being of similar order of magnitude as Driefontein Consolidated, and compared with a South African gold industry average of approximately 5.3 g/t (COM, op. cit.). Profitability would depend of course on the operating costs of mining and metallurgical extraction.

Milled tonnage and gold production: Milled throughput at full production capacity has been assumed at 100 000 tonnes per month (convenient size) which, at the assumed recovered grade of 10 g/t, equates to annual gold production of 12 tonnes.

Operating costs: In arriving at a working cost structure it was assumed that the project would generate approximately a 50 per cent operating margin,

equivalent to a long term cost of production of approximately US\$ 190 per ounce gold produced.

The cost structure was subdivided into four categories to make provision for the appropriate sensitivity analyses. The total costs were apportioned as follows: power, 11 per cent; services and stores, 31 per cent; human resources, 47 per cent; other, 11 per cent. The figures have been based on the average of the last four years for the Vaal Reefs complex (Annual Reports, 1992 and 1994).

Capital expenditure: Capital expenditure to the end of the first year of production was set at US\$225 million (1995 money terms) so that a real return of the order of 10 per cent per annum would be achieved over the 20 year life. The range was based on the returns indicated in the executive survey for North American and Australian mining projects. The bulk of this capital expenditure has been distributed over a pre-production period of three years, although this is considered extremely short in the light of the usual lead times required to develop the deeper reserves in the Witwatersrand gold basin (Eastvaal, 1993).

It has been assumed that maintenance (on-going) capital expenditure during the production period would be budgeted at 10 per cent of operating profits.

It was also necessary to categorize the capital expenditure to a sufficient level of detail to cater for the variable methods and rates of depreciation adopted by the countries under review (discussed previously in 3.4.7). Facility was included in the schedule to vary the amount spent on each capital category and the proportion of imported items.

Exploration expenditure: Expenditure on the exploration programme from initial discovery, to delineation, pre-feasibility and feasibility through to the commencement of production has been assumed at US\$35 million (1995 money terms). During the production period annual exploration expenditure has been budgeted at 2.5 per cent of operating profit.

Management fees: As is common with many mining operations, specialized technical and managerial skills are drawn from external consultancies or service groups, often administered by the controlling companies. In the South African mining industry these services are usually provided by the mining finance houses and are underwritten by management contracts which are renewed at various intervals during the life of the operation.

For purposes of the simulation it was assumed that management fees for these services were charged to the project at an annual rate of 4.0 per cent on 60 per

cent of working costs and at 6.0 per cent on 80 per cent of capital expenditures.

Funding structure: The capital required to develop the project has been assumed to be funded through both equity and interest bearing loan instruments. The exact amount of pre-production capital differed slightly, depending on the country hosting the project, mainly due to variations in criteria such as import duties. Nevertheless, it was assumed that the terms of the loans would be the same for all countries, that is, repayment periods and interest rate premiums above the U.S. inflation rate.

The debt:equity ratio was set as an input variable in the project module so that sensitivity analyses could be carried out on changes to financial gearing. A debt:equity ratio of 50:50 was assumed for the base scenario.

4.2.2 The country criteria module(s)

The country criteria module(s) comprises the mining investment code data, as discussed in section 3.0 and tabulated in Appendix G, and these have been integrated with the simulation module (see 4.2.3 below). The five countries whose data was collated were:

Chile; Indonesia; Papua New Guinea; South
Africa and Zimbabwe.

As many as possible of the quantifiable criteria in the five mining investment codes were incorporated into the module. The objective was to remove as much 'guess-work' on the impact of such criteria in order that the more qualitative aspects, such as political and administrative issues, could be evaluated from a sound base.

4.2.3 The simulation module

An abbreviated printout of the simulation module has been provided in Appendix I; only that for Chile has been included because of the voluminous content. The following notes supplement the detail by explaining each component and all assumptions made.

Country inflation and currency exchange data

Each country's economic environment would be unique, with two of the most important elements being price or cost inflation and currency exchange rates. The inflation forecast has been displayed in tandem with the U.S. inflation assumptions so that the differential factor can be calculated over time by the relationship:

$$(1 + \text{country inflation \%}) / (1 + \text{U.S. inflation \%})$$

and then compounded annually. This factor has been applied to the depreciation (or appreciation)

calculation of the particular country's currency versus the U.S. dollar. The forecasts were based simply on the historic data in the IMF (1995) document on country financial statistics.

Input of the project module cash flow data

The U.S. dollar cash flow data from the project module was transferred through to the simulation module and converted to the particular country's currency using the exchange rate forecasts. It was essential that the calculations were carried out under the monetary conditions of the country so that the various fiscal and other mechanisms were treated more accurately. This was particularly relevant to tax loss carry forward calculations which would be sensitive to future taxable income and the impact of inflation thereon.

Input of the country criteria

The country criteria data, as discussed in section 3.0 and collated under Appendix G, were also transferred through to the simulation module.

Taxation

Taxation is one of the most important criteria monitored by investors. Besides the actual percentage of taxable income payable, there are usually a range of conditional clauses, modifications and incentives

attached to the final computation. Examples include deductible capital allowances, carry-forward of tax losses and additional profits (windfall) taxes.

Because of the numerous conditional clauses, a separate calculating schedule had to be developed to manage the more complex tax computations, and particularly to maintain a record of the carry-forward of tax losses. The components of this schedule have been displayed in Appendix I.

Depreciation

Another calculating schedule was developed to deal with depreciation of capital items for tax purposes (this schedule has not been included in Appendix I). The two most commonly used forms of depreciation in the five countries' fiscal codes were the straight line (SL) and declining balance (DB) methods. Facility was included to cater for the variable rates of depreciation applied, depending on the category or deemed useful life of the capital item.

In calculating the tax write-off amounts each year, care was taken to ensure that the sum of total depreciation for a particular item was equal to the actual capital expended over the life of the operation.

4.3 Balancing Checks for the Calculations

During development of the simulation module, by gradually integrating the respective countries' mining investment criteria, it was found that a progressively complex "web" of calculations and conditional arguments evolved. A checking structure had to be developed so that integrity of the calculations was maintained and that all cash outflows (operating costs, capital expenditure, duties, taxes, etc. and payments to investors) balanced exactly with all cash inflows (initial capital funds and all revenues generated). Two checking structures were designed in the simulation module:

4.3.1 Distribution of annual cash flow

An aspect often not given adequate attention in project evaluation work is an analysis of the distribution of funds (initial capital and revenues generated) to the main, if not all, participants. This concept has also been used to check the integrity of the annual cash flow calculations.

Each component of the simulation module, as displayed in Appendix I, has been allocated and distributed to each participant in the project, coded as follows:

> PROJECT: equity (share) investors
> LOAN: providers of loan finance

- > ROY.: royalties paid to non-resident (private) entities
- > MAN.: management and administration fees
- > EMP.: permanent employees
- > OMC: on-mine costs or suppliers of goods and services
- > HG: host government (or the fiscus)

The sum of the individual components distributed to each participant must equal all cash inflows, the latter comprising the initial capital expenditure and all the total revenues generated by the project. Appendix J displays each participant's annual accruals for the life of the project under the base scenario conditions, converted to U.S. dollars for country comparison purposes.

An analysis of each participant's financial accruals should also lend some light as to the relative levels of risk attached to their involvement, thereby justifying or refuting the reasons for disagreements that can arise during the life of the project. These issues have been explored further in the analysis of the results.

*.3.2 Totals for the life of project

Each component of the simulation module was summed over the 20 year life in real 1995 (or first year) money terms. Appendix K displays the life totals for the

project in each of the five countries, the amounts having been converted for country comparative purposes to U.S. dollars. Refer also to the columns at the end of the project cash flows in Appendix I and Appendix J.

The resultant 'life' summation (horizontally) for each component was then netted vertically to give the investors' after-tax distributable earnings over the life of the project. This grand total figure was checked against the annual horizontal summation of the net after-tax earnings.

The purpose of this checking structure was to ensure that all the cash flow calculations were applied consistently in every year and that no funds 'escaped' the system.

5.0 ANALYSIS OF THE SIMULATION RESULTS

For purposes of revision, the main reasons for developing the simulation model were to:

- * provide a calculating structure to evaluate the impact of quantifiable criteria underlying an international mining investment;
- * simultaneously compare the investment or operating performance of any mining project in any country and at any time during its life;
- * reconcile some of the responses in the executive survey, as discussed in section 2.0, particularly the rates of return and payback periods required to attract mining investment to various countries; and
- * present a framework to explain the current trends in international mining investment and touch on some philosophy.

The simulation structure, as described in section 4.0, has included as many of the quantifiable elements as possible. Other criteria such as political stability, security of tenure and administrative efficiency are not included in absolute terms, but the framework provides a more established base from which to assess their relative impact.

Schreiber and Kuestermeyer (1994) discuss a similar (a copper instead of a gold project) simulation exercise but they focused on mine operating costs in eleven selected countries. Of specific mention, however, was that the results should be interpreted with an appreciation of the inputs included in the calculations and on the relativity of the numbers. For example, if the level of taxes, new infrastructure and the costs of administration delays were to be factored in to the calculations, the relative attractiveness of an investment in a country may change drastically.

The basic difference between Schreiber and Kuestermeyer's costs analysis and this project's country criteria simulation was that the latter extends the concept to include mining investment codes. The issue of operating costs has been handled as a common denominator between countries so that the impact of the investment criteria would not be distorted. It will be recognized that, within the ambit of the sensitivity analyses discussed below, the different countries' costs profiles could be evaluated by further interpolation of the results. By inference then, the benefits of the investment code in one country may be totally negated by low productivity and/or labour strife.

Considering the scope and flexibility of the simulation model there are numerous results that could be designed, retrieved and compared. The results would be

a function of the objective, circumstances and background of the user. The following discussion of the results covers many of the applications but, in the interests of brevity, some have had to be excluded.

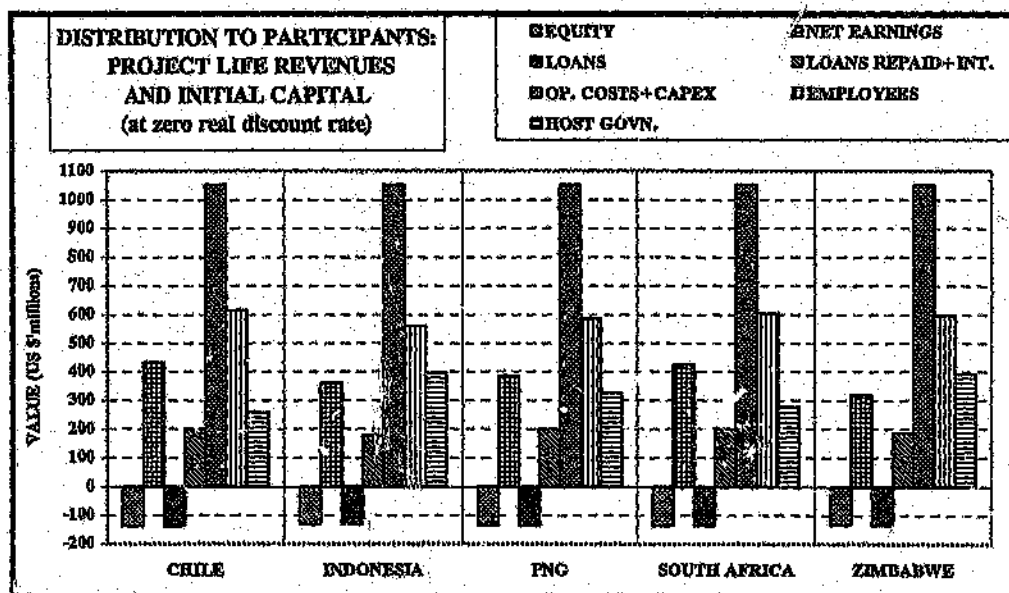
5.1 Distribution of Project Value Between Participants (life of project)

The distribution of the cash flow as a calculation checking structure has been discussed previously (see section 4.3). Figure 5.1 compares the present value in U.S. dollars of the amounts accruing to each participant over the life of the project in the five 'test' countries.⁷ The amounts have been displayed in Appendix K for reference, and also in Appendix J in the totals column. A zero real discount rate has been applied for purposes of neutrality because the selected participants, except for the investors, have not contributed risk capital in the same sense as the investor.

It should be pointed out that Figure 5.1 does not show the distributions to royalty holders and management service entities as these amounts are relatively small in the overall context. This need not be the case, however, and would depend on particular circumstances and agreements.

⁷ The amounts compared only reflect the actual cash flow generated by the project. No attempt has been made at estimating the multiplier effects in each country's economy.

Figure 5.1 **Distribution of project value by participant in each country**



The following notes clarify the legend headings:

- Equity:** The initial capital injected by the foreign investor(s) before the project achieves self-funding status.
- Net earnings:** The net after-tax earnings available for distribution to investors, net of with-holding taxes.
- Loans:** The amount of loan finance provided for the project before self-financing.
- Loans repaid:** Interest payments on loans including the principal repaid.
- Op. costs:** Comprises all other costs, operating and capital in nature, over the life of the project (excludes employees' costs).
- + capex**

Employees : Payments to employees; comprising wages, social security payments, and profit share if applicable. Individuals' tax is not deducted.

Host govn: Total accruing to the host government; comprising all project taxes and sundry duties. Employees tax is not included.

The most striking aspect of the analysis was the average distribution of some 85 per cent of the total revenues accruing to the country, comprising government, 14 per cent; employees, 26 per cent; goods and services, 45 per cent. This compares with the 15 per cent to 'foreign' interests (equity earnings + interest and principal on loans + royalties + management fees). The latter figure is net of the original capital injected; total earnings of 27 per cent less the capital which amounts to 12 per cent of the total revenue plus capital figure. These calculations are shown at the base of the table in Appendix K.

By demonstrating clearly the distribution to participants of the project's value in each country, it may help to reduce misconceptions about the fairness of their 'takes' relative to their respective risks. Experience over decades has shown that conflict arising between the investor, labour (employees) and the host

government usually stems from disagreements on the equitable distribution of the monetary benefits.

The comparative magnitude of these amounts draws attention to the level of risk carried by the foreign investor in new mining development vis-à-vis the risk to the host country. It is submitted that the impact on the country of losing a portion of the value (cash flow) would be far less than the impact the same amount would have on the foreign investors and their returns, thereby improving the attractiveness of the country as a business destination.

It has not been explicitly mentioned but significant benefits can be generated from the development of mineral resources, particularly regarding skills training and ancillary business development. Although in the context of a poor outlook for developing country mineral development at the time, O'Faircheallaigh (1985) discusses these issues in some detail in the context of host governments' policies.

Based on the simulation results it is not surprising that foreign investors should be extremely sensitive to the amount of capital exposed for a given period, particularly if their own capital base is comparatively small. In relative terms it would appear that there is nowhere near the same degree of 'up-front' risk to the country as a whole. It also goes some way to explaining the comfort of foreign investors when multi-lateral

funding (IFC and World Bank) is involved, just in case the conditions on which the investment was originally based suddenly change for the worse. Otto and MacDougall (1994: A117-118) allude to these issues in the context of project financing, i.e. the raising of loan funding on the basis of anticipated earnings, but with limited-recourse to the equity investor.

5.2 Sensitivity of Host Governments' and Investors' Accruals to Changes in Selected Criteria

Figure 5.1 has displayed a simplified distribution of project value between the various participants. In terms of the theme of the research project it would be useful to consider the sensitivity of the participants' accruals to changes in various criteria, thereby providing a gauge on the relative impact of the latter. In the interests of brevity and to demonstrate the principles, the impact of selected criteria on only the host government and the equity investor have been analyzed.

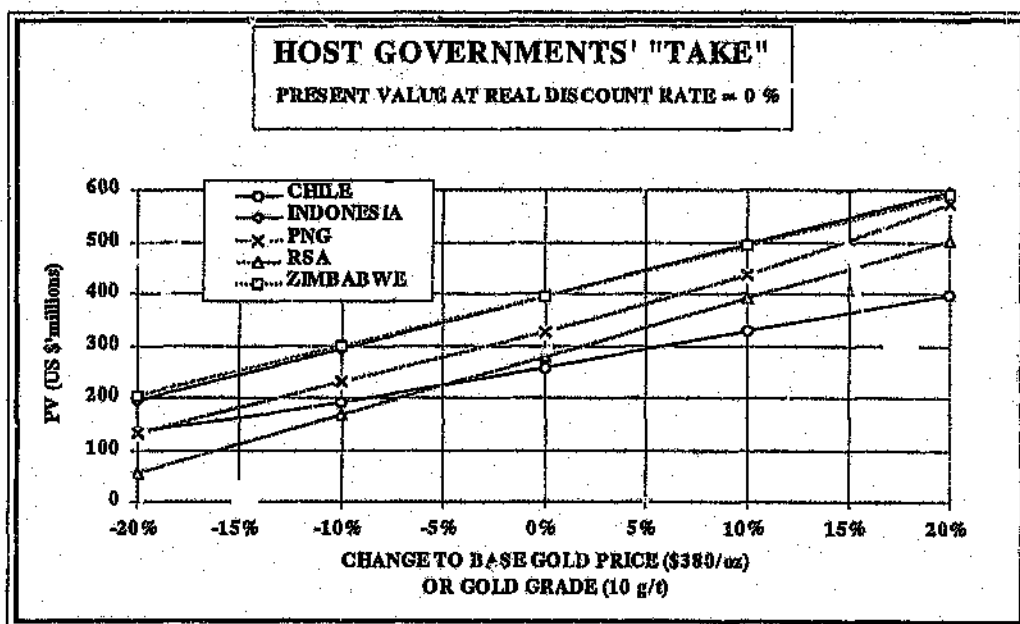
A concept which has been used extensively in the sensitivity analyses is equating changes to the gold price (base scenario: \$380 per ounce) with changes to the recovered gold grade (base scenario: 10 g/t). This concept has been introduced at the outset because most of the criteria influencing mining investment decisions can be measured in cost (or benefit) terms equivalent

to mineral grade. The principle extends to mineral economic theory where an investor would require a different 'class' or grade of ore deposit to achieve a minimum rate of return, depending on conditions in each country.

5.2.1 The host governments

Figure 5.2 compares the total accrual to government in each of the five countries over ranges of profitability, as simulated by changes to gold price (or gold grade).

Figure 5.2 Host governments' "take" per change in gold price (or gold grade)



The value accruing to the government in Chile is noticeably lower than the other countries. South

Africa's accruals are situated mostly between Chile and the other three countries'. The position would have been better for the S.A. government if the with-holding tax (15 per cent of remittances) had not been scrapped recently, but at the expense of the investor. This is a good example of changing codes to help attract foreign investors. The effect of PNG's additional profits tax can be seen at higher gold prices (or grades) where the gradient of the curve starts to increase.

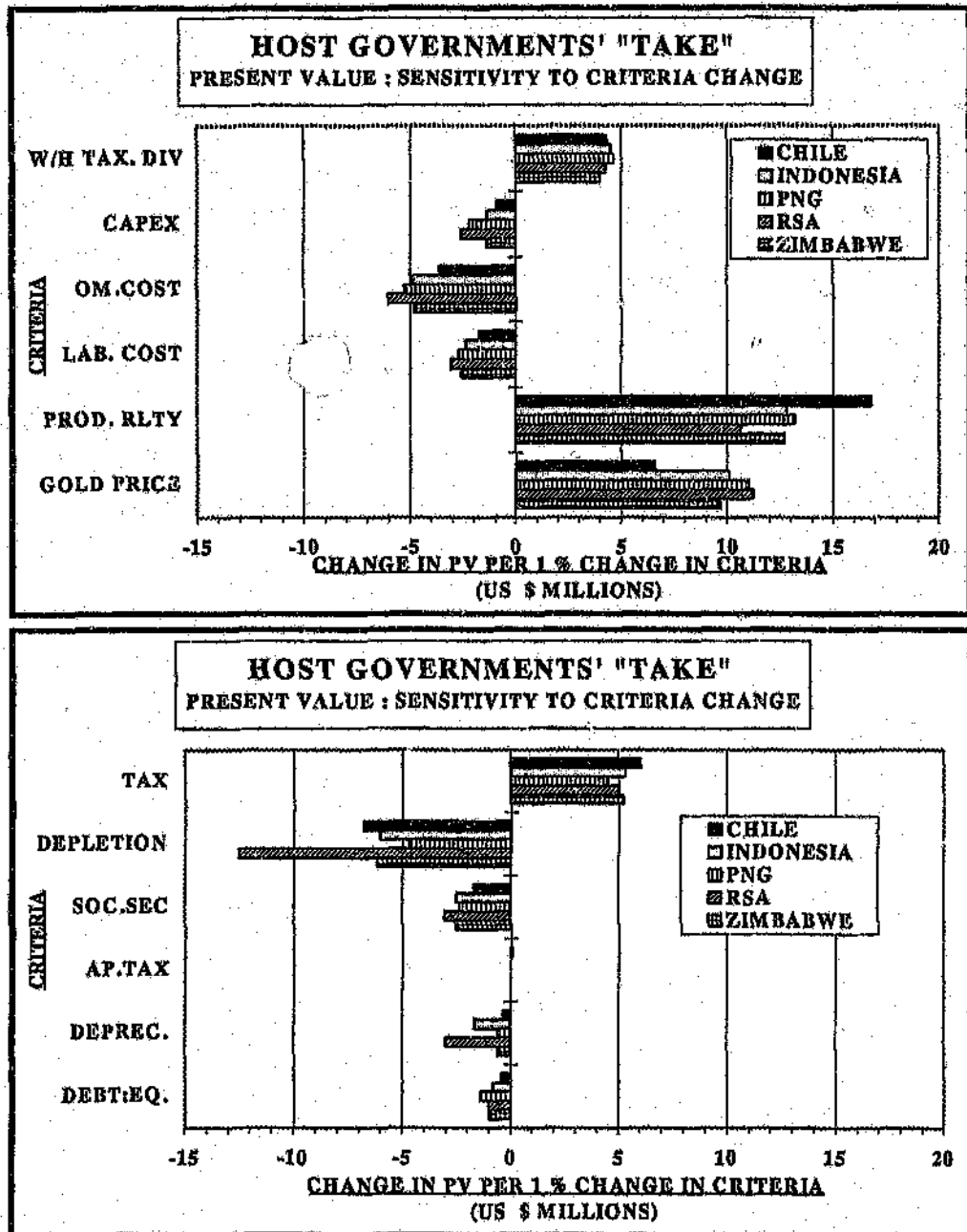
Sensitivity analyses were carried out on other selected criteria. For purposes of summary presentation the change in host government total 'take' was measured per one per cent change in criteria. The comparative results for each country have been displayed in Figure 5.3. The equivalent amounts for the gold price (or gold grade) sensitivity are shown for reference purposes, that is, an abbreviated version of Figure 5.2.

The charts in Figure 5.3 demonstrate a number of effects on the host governments' 'take':

- * Each criterion has a differing relative impact in each country.
- * The impact per change in one criterion can be equated in terms of another criteria. For example, the impact in PNG of changing the tax rate by 10 per cent would

be equivalent to changing the gold price (or grade) by approximately 5 per cent.

Figure 5.3 Change to host governments' "take" per change in selected criteria



- * The production royalty levied by some governments has the greatest impact on their total accruals (see below for the impact on the investors).
- * The change in labour cost: can be equated to changes in productivity, for example, a 10 per cent change is equivalent to changing the gold price (or grade) by approximately 2.5 per cent.
- * With-holding taxes on foreign remittances can have a significant impact on the host governments' total take. In this case, a 10 per cent change would be equivalent to as much as a 5 per cent change in gold price (or grade).
- * The additional profit tax does not appear to have much impact under the base scenario conditions. It is questionable whether this type of tax is worth administering for the fiscal revenue likely to be generated. As commented previously (see section 3.4.3) investors view this tax as a major disincentive.

5.2.2 The investors

From the investors' perspective the net present value (NPV) at a real discount rate of 10 per cent in each country has been compared in Figure 5.4. The 10 per cent discount rate was chosen on the basis of the requirements of the executives for projects in North

America and Australia. The general profile is approximately the reverse of the governments' position as shown in Figure 5.2.

Figure 5.4 Investors' NPV per change in gold price (or gold grade)

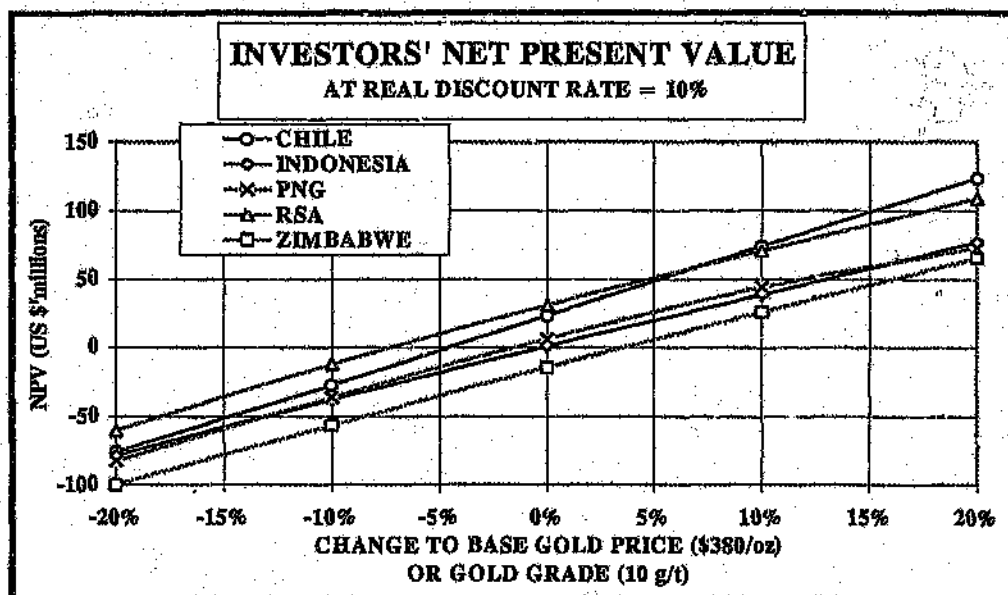


Figure 5.4 illustrates the concept mentioned previously which is the level of gold price (or gold grade) required by an investor to achieve the same NPV, at a 10 per cent real discount rate, in each country. For example, if the investor were to achieve a NPV of US\$50 million in PNG the gold grade of the deposit would have to be approximately 10 - 15 per cent higher than in South Africa or Chile. The next series of investment decisions would have to focus on whether the geological setting in PNG provides the potential for such

projects, and then the relative degree of political and administrative risk would have to be considered.

By the same token the positions of the investor in Chile and South Africa, under the 'test' project parameters considered, are quite close. If consideration were to be extended to geological setting, an investor might start penalizing South Africa because the Witwatersrand gold basin has been explored and producing for over 100 years. Because of criteria such as ever-increasing depths of mining, the attendant capital required, the lead times to first production and the recent labour demands, investors might view Chile as a far better prospect than South Africa on a risk and return basis. Factoring in these 'costs' to the test project the investors' NPV curve for South Africa would be pushed much lower than that shown in Figure 5.4. Other observations from Figure 5.4:

- * The impact of PNG's additional profits tax on the foreign investor is demonstrated at the higher gold prices (or grades) where the gradient of the curve diminishes relative to the other countries'.
- * A similar effect is shown for South Africa where the gradient of the curve is less than the other countries (except PNG). This is due to the higher formula based tax 'take' per change in gold price (or grade).

- * Chile appears to offer the investor the most benefit in NPV terms at the higher levels of profitability. The investor would be better off, however, in South Africa with the less profitable projects, all other things being equal.

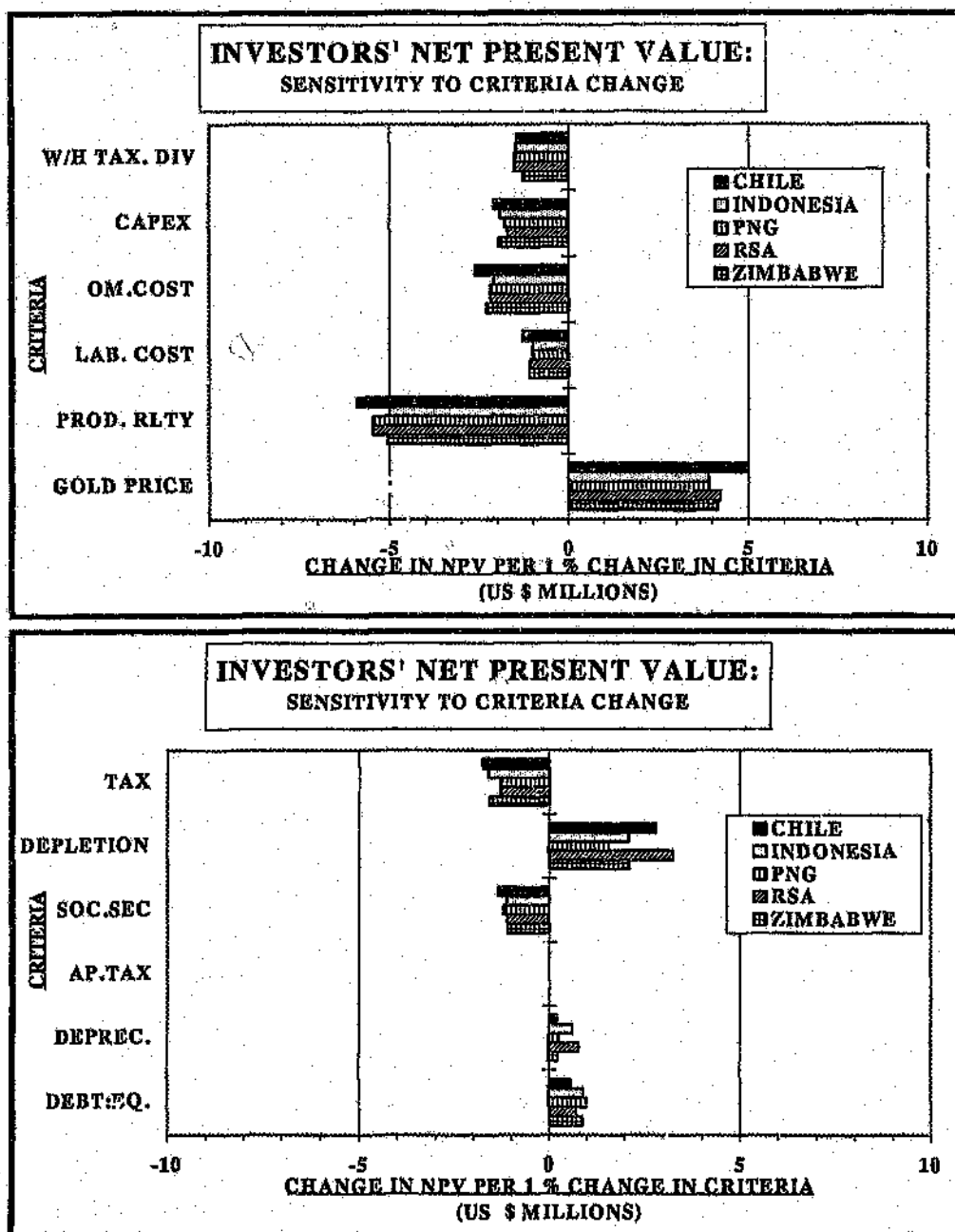
The above examples demonstrate the broad application of the simulation model to international mining investment decisions.

The same series of sensitivity analyses as those for the host governments have been carried out for the investors, as shown in Figure 5.5. Most of the observations applicable to the host governments' positions are relevant but a few specific issues are noted:

- * The revenue-based royalties have the greater impact on investors' NPV than any other criteria analyzed. Of the five countries compared in this study, Indonesia and PNG apply this type of tax. It is not surprising that investors are very critical of this fiscal instrument (see section 3.4.1).
- * The depletion allowance (essentially a percentage of revenue deducted from taxable income) can have a significant positive impact on investors' earnings, particularly if it were to be applied in South

Africa. The reason for this is that the tax rate is higher in S.A. than the other countries.

Figure 5.5 Change in investors' NPV per change in selected criteria



* The with-holding tax can have a significant impact on investors' earnings, approximating 50 per cent of the impact that would result from a change in the gold price (or gold grade). As mentioned previously, however, South Africa has recently removed this form of tax (15 per cent NRST) on non-resident investors' remittances and, on the basis of Figure 5.5, this has saved some US\$30 million for the investor over the life of the 'test' project.

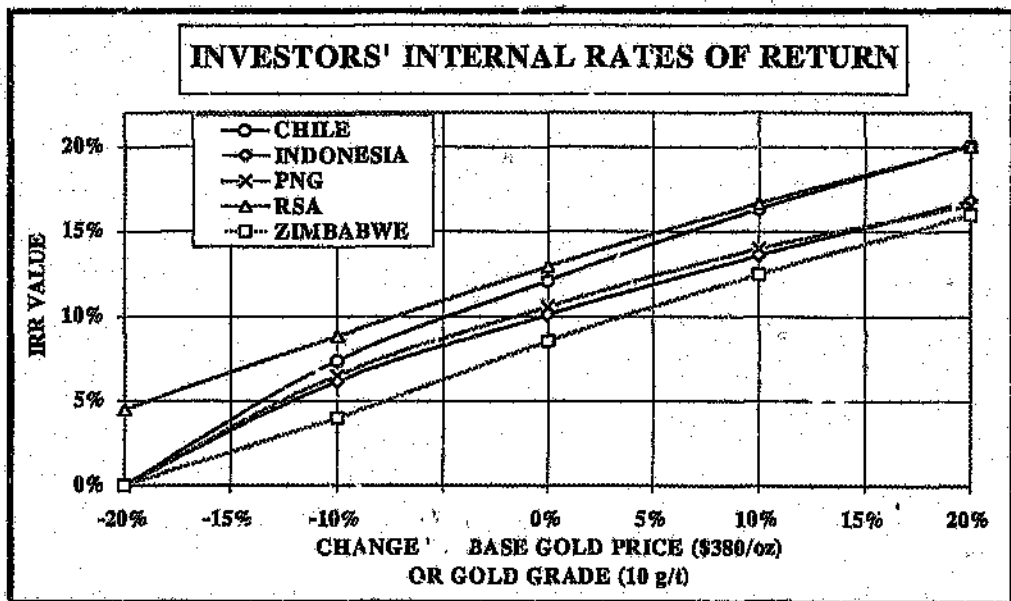
These are a few interpretations that can be made from the simulation framework. Another, which has been mentioned previously, is the equivalence approach where the impact of each criterion can be measured in terms of the impact of other criteria, such as gold price, ore grade or even tax rate.

5.2.3 Investors' internal rates of return (IRR)

The analyses thus far have focused on the relative accruals to the host government and investor, as measured by the PV and NPV respectively over the life of the project. Another common measure used in mining investment analysis is the internal rate of return (IRR), particularly as applied to the investor who has injected the initial risk capital. Figure 5.6 compares the IRR values for an investor in each country over a range of gold prices (or gold ore grades).

The curves show similar relative positions to those depicted in Figure 5.4, which should be the expected, but there are some adjustments because of time value of money effects. For example, South Africa offers better returns than Chile over the whole range analyzed which

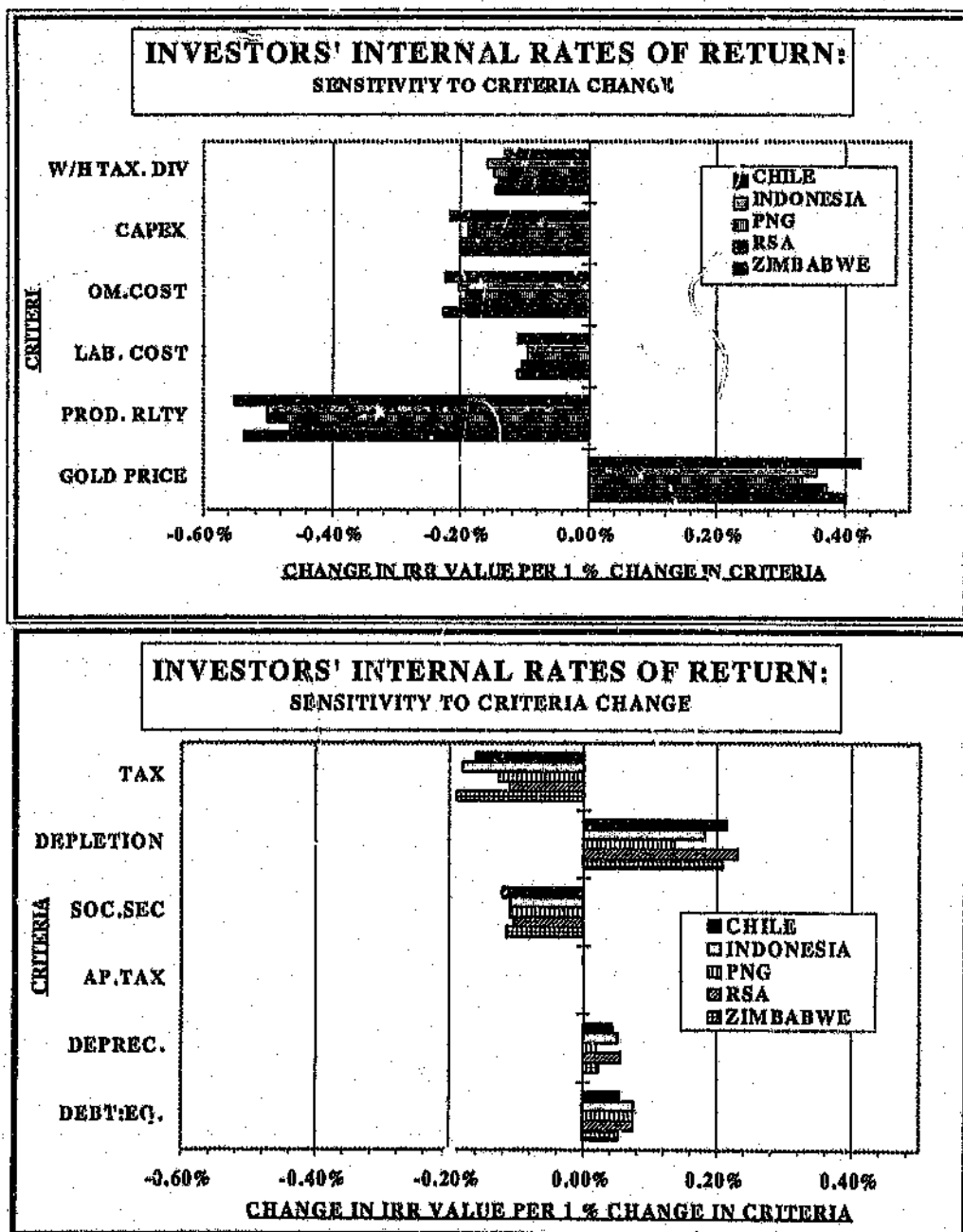
Figure 5.6 Investors' IRR per change in gold price (or gold grade)



was not the case in Figure 5.4. This can be explained by the project's tax liability starting later in South Africa than the other countries (refer also to Appendix J - the equity earnings profile). The reasons for this are the 100 per cent capital write-off against taxable income in the year of expenditure and, while unredeemed capital expenditure is carried forward for a new mine, the 12 per cent capital allowance can be applied.

As with the previous formats, the impact of selected criteria on the IRR has been shown in Figure 5.7.

Figure 5.7 Change in investors' IRR per change in selected criteria



The sensitivity profiles of the selected criteria on the IRR are similar to those shown in Figure 5.5 for the investors' NPV sensitivities. The same principles for interpretation as discussed previously would apply, for example, the equivalence of the impact on the IRR of one criterion in terms of the impact of another.

Of particular relevance to the IRR analysis, however, was the magnitude of mining investment returns expected by the executives in the survey. To achieve returns of some 30 per cent in Zimbabwe, for example, the 'test' project (base IRR: 9 per cent as per Figure 5.6) would have to achieve a recovery grade some 50 per cent higher, or 15 g/t (as equated to the gold price sensitivities). This is not impossible but the scale of the project (12 tonnes gold per annum) may be difficult to achieve, considering Zimbabwe's greenstone geological setting. Other criteria such as lower labour costs would reduce the minimum investment grade required, however. For example, a 50 per cent improvement in productivity would add approximately 5 per cent to the IRR value, thereby reducing the minimum gold grade by some 12-15 per cent.

For the executives in the survey to consider a mining investment in Indonesia, on the other hand, the expected returns would be of the order of 20 per cent per annum (10 per cent higher than the test project IRR). The test project would have to achieve a recovery

grade some 30 per cent higher than the base 10 g/t, or 13 g/t. This could be lowered, however, if the lead times to first production were shorter than the base 3-4 year period assumed and the capital outlay reduced. The copper-gold deposits in Indonesia (Irian Jaya) do have the potential to achieve a larger scale than the 'test' project and do not have the depth risks of the Wits gold deposits.

An example would be Freeport McMoran's Ertsberg-Grasberg project which is planning to expand annual metal production to 500 000 tonnes copper and 1.5 million ounces (46.7 tonnes) gold by 1996 (Mining Magazine, 1994a: 113). To achieve this, mill throughput is to be increased from 66 000 to 115 000 tonnes per day at a total capital cost of US\$685 million. Assuming a pro rata relationship to milled tonnage this equates to an incremental increase of approximately 200 000 tonnes copper and 600 000 ounces gold. These additional copper tonnes would produce revenues of US\$600 million at a copper price of US\$3000 per tonne, equivalent to 1.58 million ounces gold at a price of US\$380 per ounce. So, for three times the capital assumed for the 'test' project, Grasberg is expanding production by 2.2 million ounces (equivalent) gold, or six times the 'test' project's gold production (386 000 ounces). The returns on this expansion should be well in excess of the 10 per cent real returns estimated for the 'test' project.

These examples demonstrate some of the philosophy behind the current trends in international mining investment. The executives in the survey all agreed that the returns required to attract investment into some regions in the 1990's were lower than those envisaged for the 1980's. By analogy the ore grade of a deposit need not be as high as was required in the 1980's. The probability of finding suitable projects must therefore be enhanced. Furthermore, the 'costs' of any combination of other criteria (government inefficiency, tax rates and other disincentives) may have reduced, which would be equivalent to lower investment cut-off grade. In other words, the premiums have been lowered and the flow of capital from the industrialized world to the developing countries can be motivated more convincingly.

5.2.4 Investors' payback period (FBP)

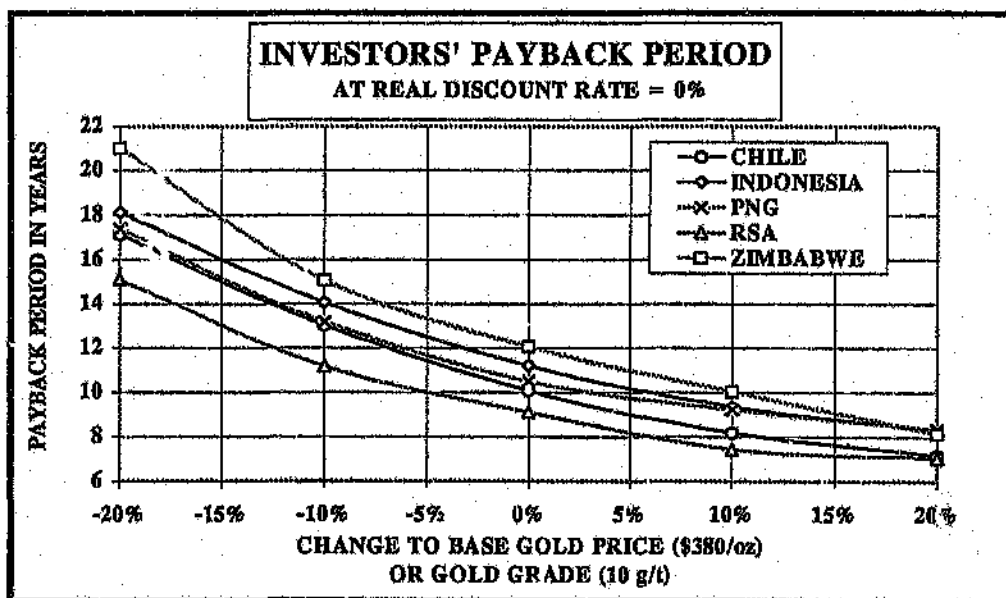
Executives in the survey placed considerable importance on the time period to recoup their initial capital outlay, or the so-called payback period. This measure has been applied to the 'test' project results and Figure 5.8 displays the FBP (assuming a zero real discount rate on earnings) in each country for a range of gold prices (or gold grades).

It is emphasized that the pre-production period of approximately 4 years has been included in Figure 5.8 because it was felt that the risk period should

commence when the first tranche of capital had been committed to the project. The executive survey results, however, reflected the period commencing when self-financing was achieved. Therefore to compare the executive survey with this analysis, the initial period of 4 years should be deducted from the figures shown in Figure 5.8.

Attention is drawn to the investors' position in South Africa where the shortest PBP of 5 years (9 less 4 years pre-production period) would be achieved, assuming the base scenario conditions. The longest PBP

Figure 5.8 Investors' PBP per change in gold price (or gold grade)



NOTE: The PBP values in the graph includes the four year pre-production period assumed in the 'test' project.

would be found in Indonesia and Zimbabwe, i.e. 7-8 years (11-12 less 4 years). The principal reason for this, as mentioned in the discussion on IRR comparisons, is the more generous capital write-off tax regime in South Africa; this delays tax payments and enhances earnings for the investor. Another factor adding to the PBP in Indonesia is the production royalty levied.

The PBP analysis would comprise only a step in the decision making process. An investor would have to assess the probability of achieving the parameters of the 'test' project in each country. Expanding on a previous example, there would be a slim chance of discovering a stand-alone, Wits gold mine with a lead time to first production of under 4 years, together with a 50 per cent profit margin (refer back to Figure 2.3 in section 2.5). Furthermore it would be unlikely that the self-financing stage could be reached for capital costs less than US\$300 million (R1100 million). The FM (1993: 25) discusses these harsh realities in the context of new business opportunities for the S.A. mining houses.

A practical example would be Anglo American's new Moab project (Eastvaal, 1993), contiguous with Vaal Reefs' south lease area. Development costs have been estimated at some R1977 million (in escalated money terms or approximately R1800 million in 1995 money terms). This amount would approximate US\$500 million in 1995 money

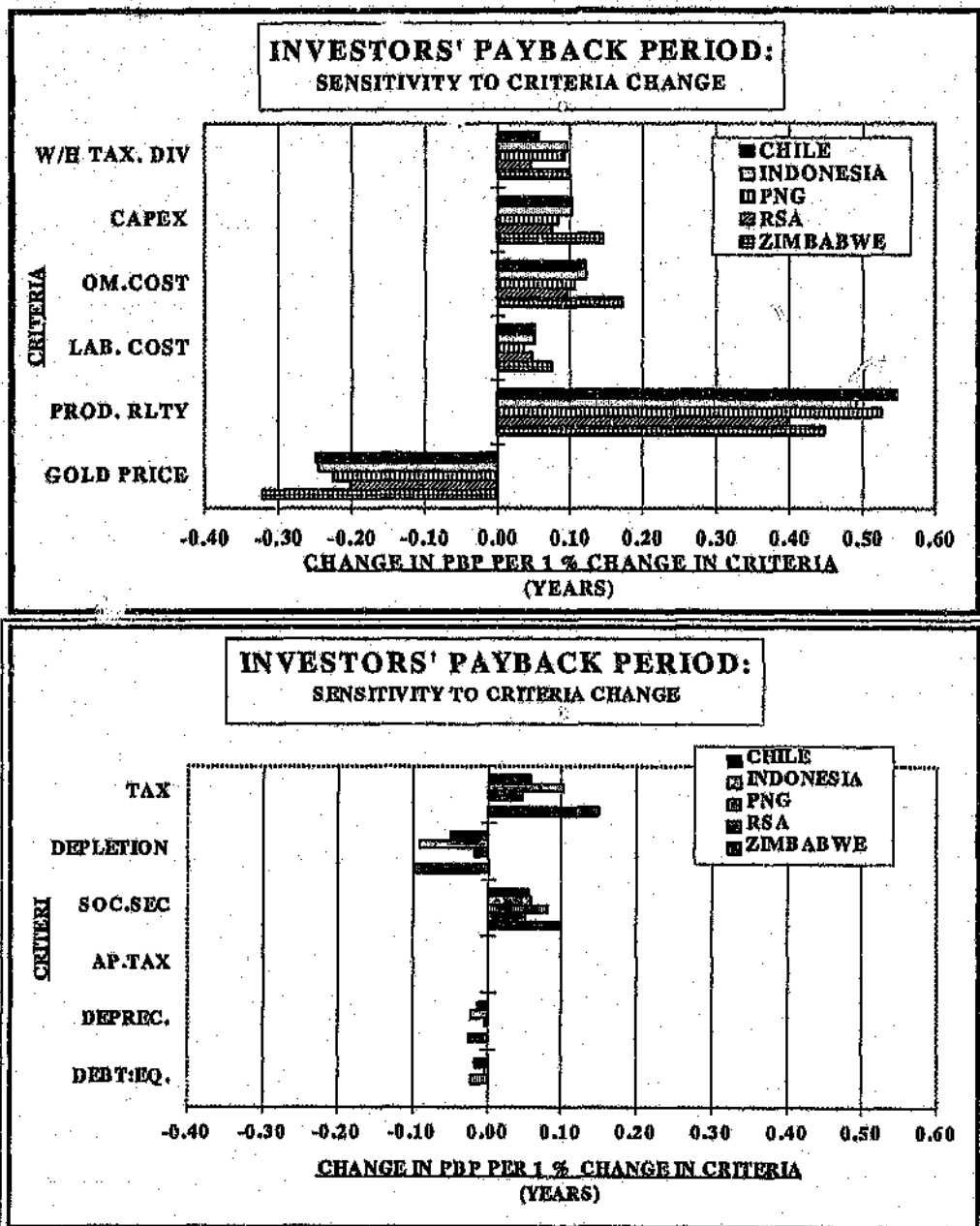
terms and has been planned to be spent over the period 1992 to the self financing stage in 2000. Moab is expected to produce 12-13 tonnes gold per annum from 1,14 million tonnes of ore milled, to be extracted from depths ranging between 2200 - 3700 metres below surface.

Fortuitously, costs of production are forecast to be in the region of US\$190 per ounce gold produced, equating to a profit margin of 50 per cent at a long term gold price of US\$380 per ounce. However, as a stand alone project competitive returns of 10 per cent or more would be impossible to achieve because the capital cost alone would be around twice that assumed for the 'test' project which was some US\$270 million to self-financing.

Nevertheless the Moab project has been allowed to proceed. The reasons for this are firstly, Vaal Reefs facilities have been used for underground pre-development, thereby shortening the lead time to production and secondly, Moab's capital expenditure can be written-off against Vaal Reefs' taxable income - the so-called tax shield. This allowance reduces the capital funding that investors would have to inject to approximately R750 million (escalated) or approximately US\$210 million. These positive factors would move the project back into more competitive terms vis-à-vis the 'test' project.

Similar to previous analyses, Figure 5.9 displays the sensitivity of the investors' payback period to selected criteria in each country.

Figure 5.9 Change in investors' PBP per change in selected criteria



Note that the results should be read in relative terms because the sensitivities over a range of criteria are not linear, as shown in Figure 5.8.

Other than similar applications and interpretations to those discussed previously, two effects specific to the PBP sensitivity analyses are noted:

- * There is no impact on the PBP in any country by levying an additional profits tax (note that PNG already has this tax). The reason is that the tax would become payable later on in the life of the project, or only when the stipulated 12 per cent premium (to U.S. prime) return has been achieved.
- * The investors' PBP in South Africa has not been affected by varying the non-cash criteria such as depreciation and depletion. As tax only becomes payable later than the other countries, due to the 100 per cent capital write-off and 'new mine' allowance, the initial capital is paid back before these criteria impact on PBP.

6.0 SUMMARY AND CONCLUSIONS

There were four phases to researching the criteria which have been influencing trends in international mining investment:

- * keeping abreast of current events in the global mining industry;
- * carrying out a survey (by personal interview) of the opinions of selected senior mining finance executives in the USA and South Africa;
- * comparing the mining investment codes of five countries; namely, Chile, Indonesia, Papua New Guinea, South Africa and Zimbabwe; and
- * developing a simulation framework to evaluate the impact of various criteria on mining investment performance, with particular reference to the five countries' mining investment codes.

In the light of the expansive and ever-changing nature of the investment environment there had to be limits set as to the level of detail many issues were researched. Although a broader approach had to be adopted most issues were placed into perspective and some very clear messages were presented:

6.1 Executive Survey

6.1.1 Global events and situations

The most significant event impacting on the global political and economic landscape over the past 5 - 10 years has been the demise of the former USSR. This heralded the collapse of support for sympathetic ideologies around the world. Accordingly, many countries have had to adjust to the new status quo by creating more 'friendly' political, economic and legislative structures.

Not surprisingly the trend has been particularly prevalent throughout the developing or 'emerging' nations where much attention has been placed on attracting investment capital, primarily from the wealthier, industrialized countries. In essence, the emerging nations have had to introduce laws and incentives to alter the risk and return balance for international investors. A manifestation of these efforts has been the trend towards privatization of state-owned assets and a more committed acknowledgement of free-market principles.

6.1.2 Important criteria for mining investment

In the context of the above mega-trends, it was established that there were numerous criteria which

investors and financiers give priority when making investment decisions.

Without doubt the stability and transparency of political, legislative and administrative structures were the most important issues. Underlying factors cited as being particularly important were security of tenure, the ability to repatriate capital and income, the overall level of taxation and other duties. It would be impossible to instil confidence in the latter criteria without stable structures to support their implementation and management.

Interestingly, participants in the executive survey and another survey did not see criteria such as climate, availability of skills and infrastructure as major deterrents. These criteria did not seem to instil as great a sense of wariness as did the socio-political structures.

The more technical criteria such as ore deposit grade and size, operating costs and development capital expenditure to self-financing were not explicitly surveyed. These factors were considered obvious and a pre-requisite to the successful development of a mining project. Nevertheless, their importance was kept in perspective and within the context of the objectives of the research effort.

An appropriate analogy for the two groups of criteria would be the 'horse (political and legislative structure) and carriage (technical criteria)'. It would be difficult to move forward competitively if one or the other was unserviceable. On balance, however, political stability appeared to be the most important component; after all the horse can move forward without the carriage but the carriage cannot move anywhere if the horse is lame!

The importance of these socio-political structures can be demonstrated by citing examples of several large known mineral deposits which have yet to be developed in hitherto unstable countries, for example, Zaire, Angola and the former USSR.

6.1.3 Mining investment trends

In the context of the mining industry the most noticeable manifestation of these underlying trends has been an increasing flow of exploration dollars into Latin America, particularly by North American firms. The attraction to the developing regions has been enhanced by modifications to their investment codes and by the more hostile climate for mining in the industrialized world, e.g. stringent environmental laws and permitting procedures. The degree to which the developing regions have been under-explored relative to their developed counterparts has also been a factor.

As of 1993-1994 the mining investors' regional order of interest appeared to be Latin America, the Pacific Rim, then Africa. There may well have been an element of bias because the North Americans naturally might view the regions closer to them in a more positive light; familiarity was found to play an important role. Although mining development activity in Africa was virtually non-existent until about five years ago, momentum has been gathering pace more recently as countries (and governments) across the continent have been joining the world competition for investment capital. Although regional comparisons have been made, they should be taken in context; specific countries within Africa may be more attractive than some countries in Latin America. Ghana and its surging gold mining industry would be a case in point.

The former USSR and China have also been attracting renewed attention because of their vast geographic extent and potential for mineral development. Nevertheless, investors appear to be somewhat cautious, pending the transition to sustainable political and economic structures.

6.1.4 Rates of return (IRR) and payback periods

The (internal) rates of return and payback periods required by mining investors varied considerably between countries. The real returns required in the riskier regions, such as Africa and the CIS, were of

the order of 30-40 per cent with payback periods of 1-2 years. In the developed or less risky areas, such as North America and Australia, the equivalent figures were 10-15 per cent and 5-7 years respectively. There appeared to be some broad agreement with other published commentary on the issue, however. Notwithstanding the enhanced returns from new financing structures the higher these expected returns the less chance of mineral development. The logical conclusion would be that the regions are made less risky.

6.1.5 General observations

Several corollaries were drawn from the executive survey:

- * The "winds of change" have opened up countries and regions to skills, technologies and financing structures which previously were restricted to the Western or free-market economies. Assuming success by mining firms in the discovery and development of new mineral occurrences, a very different global production "landscape" could be in prospect within 20 years or so. The impact on commodity markets and prices might be significant because of implied changes to cost and risk profiles, let alone the emergence of a new global cost curve for various mineral industries.

* The involvement of the multi-lateral funding agencies, such as the World Bank, IFC and MIGA, has been cited as one of the principal means of stabilizing the operating environment in developing countries. Their participation tends to offer private investment capital (and management) some protection against ad hoc policy changes and nationalization of assets by host(ile) governments. One executive observed that it was the colonial powers previously that maintained the enabling environment for risky, long term businesses such as mining. In the 1990's it appears to be the co-ordinated effort of the industrialized nations through the multi-lateral agencies that has taken over this role.

* The environmental protection issue continues to play an important role in the mining development process. Nevertheless, it was concluded that, over time, standards are likely to be applied uniformly on a global basis. It is likely to be extremely difficult for mining developers to raise funds from institutional sources unless international environmental impact standards have been met.

* Perceptions of the risks and returns attached to a mining investment seem to differ quite markedly depending on the executive's or company's familiar operating base. The relevant examples here would be the U.S. based firms' affinity towards Latin America compared with South African (or even European) firms'

more positive view of the African arena. An extension to this would be that managing geographic diversification of mining businesses will be an important issue on the agenda of many corporations. For example, some of the decisions revolve around whether to joint venture with local partners, or transfer in-house expertise to unfamiliar operating environments, or a combination of the two.

6.2 Simulation of Mining Investment Environments

Following the findings from the executive survey, and other published surveys, it was decided to review the actual constituents of various countries' mining investment codes. There was also the question of the relative impact of various criteria on the investment performance of a mining project.

To provide a realistic base for the review, five countries were selected as reference cases; Chile, Indonesia, Papua New Guinea, South Africa and Zimbabwe. It was clear that the codes included, or alluded to, many of the criteria mentioned in the surveys. Although there were differences in detail between countries, there were broadly similar headings; company structure (subsidiary or branch office), level of foreign ownership, debt:equity limitations, repatriation of capital and earnings, social security responsibilities and fiscal regime.

Considering that many of the criteria were quantifiable, a calculating framework was developed to simulate the cash flow performance of a 'test' gold mining project in the different countries. The framework also provided the means to think through several mineral economic and philosophical principles.

It was important to acknowledge, however, that the simulation framework would only reflect the criteria which had been explicitly quantified. For example, if there were extreme climatic conditions, or low labour productivity, then these would have to be factored into the framework, with the result that a very different set of conclusions could be drawn. However, by starting from a structured calculating base it was easier add on the 'building blocks' and to place the more qualitative criteria into perspective.

6.2.1 Distribution of project value

At various stages during the life of a mining project, debate and negotiation take place as to the distribution of the expected monetary benefits. One of the most striking features of the simulation results was the amount of (foreign) capital invested and the net earnings or returns relative to the amounts accruing to the host country (and government).

As a proportion of the total revenues generated (100 per cent) an average 14 per cent accrued to the host government and 13 per cent to investors (both equity and loans) net of initial capital injected. Most of the remainder went to employees, 25 per cent (before personal taxes deducted), and provision of goods and services, 45 per cent. A total of over 80 per cent would accrue to the country. These figures have been classified rather broadly because some investors may be local (as opposed to foreign) and some goods and services would be imported. If one assumes 50 per cent of goods and services were imported then some 60 per cent of the total revenues generated would still accrue to the country.

The point that needs to be made is that a relatively small change in the benefits accruing to the country (or government) may have a far greater impact on the investors' returns, thereby enhancing the chances of attracting development funds. The basic choices are for the country to give away a little to gain much and for the investor to gain much from a little. It need not only be the result of a tax reduction for example, it may be an improvement in the efficiency of government administration so that overall costs are reduced.

The key to success seems to be a clear demonstration to all participants as to the distribution of the benefits accruing from mineral development. By the same token it also needs to be demonstrated the disadvantages

attached to lack of development. Bearing in mind the poverty in many parts of the world, the age-old conflict between the host country and the providers of capital (and skills) is inappropriate and cannot be afforded.

6.2.2 The impact of various criteria

Although several participants were identified, usually the host government and the investors have to agree on whether a mining project is developed or not. Extending the distribution analysis, the monetary benefits accruing to these two parties were simulated over a range of changes to various criteria, i.e. sensitivity analyses.

Bearing in mind the level to which criteria could be quantified in the simulation, the net accruals to each of the two participants was different in each country (as detailed in section 5.0). Although the differences were certainly noticeable in cash flow terms, and provide a base for analysis, it was debatable that the extent of the differences warranted an investment decision being made solely on those quantifiable elements. It would be a matter of judgement as to the relative magnitude or impact of other criteria, such as prohibitive environmental laws, infrastructure deficiencies and inefficient administration. The impact of these factors could push an investment decision away from a particular project in a certain country to

another, although the quantifiable elements would indicate otherwise.

There were several other issues highlighted in the simulation results and sensitivity analyses:

- * Comparing some criteria without due consideration of the time dimension can lead to incorrect interpretations about their relative impact. An example of this was the case of South Africa where, for a new mining project, tax becomes payable later than the other four countries, all other things being equal. This was due to the 100 per cent write-off of capital expenditure to taxable income and the additional capital allowances on the unredeemed balances carried forward. However, when tax became payable the tax rate was higher over most ranges of profitability in South Africa than in the other four countries. Participants need to be cautious about the trade-off in instances such as this.

- * It has been commented previously that the cash flow benefits accruing to the host government and investors would be different in each country. Hypothetically, for the participants to receive the same investment value in each country, some criterion would have to be adjusted from the current base situation, e.g. a tax rate, an incentive allowance or even labour productivity. Most importantly, this could also be achieved if the grade of the mineral

deposit were different, as much as 10-15 per cent in the countries tested. This concept can have major ramifications for exploration strategies because the probability of the geological terrain hosting a certain 'class' or size of mineral deposit has to be assessed.

* Sensitivity analyses of the impact of selected criteria on participants' positions showed a range of effects. Not only did the impact of each criterion differ considerably within the same country but also the impact of the same criteria in different countries. In terms of a broad impact ranking the revenue or production-based royalty levied by some countries had the most significant impact on both the host governments' (increase) and investors' (decrease) positions. Other criteria having a considerable impact were, in order after the production royalty, gold price (or gold grade), depletion allowances, corporate tax rates and withholding taxes.

* An extension to the sensitivity analyses was interpreting the impact of a change in one criterion in terms of the impact of changing another. For example, the impact of a change in production royalty could be as much as 50 per cent higher than the impact of a change in the gold price (or ore grade).

The range of results appeared to support the findings of the surveys (and literature) where the critical issues in any mining investment decision relate to political, legislative and administrative stability. The quantitative criteria certainly have to be evaluated but the credibility of the results would be entirely dependent on the support of the political and legislative structures. Based on this premise, an investor may even decide to develop a mining project in a country where the investment codes are relatively onerous but their stability in the long term is assured.

6.3 The Costs of Political Structures: Some Philosophy

The research process raised some philosophical issues attached to the mineral development business, both from the host country's and the investor's perspective.

The simulation results showed the costs and benefits of changing certain criteria in terms of ore deposit grade. For example, if a tax rate was increased, and investors wished to achieve a minimum rate of return, a higher grade for the deposit would be required - all other things being equal. Using the same argument; if investors were confronted with administrative inefficiency and political uncertainty this could add substantial costs because of wasted time, effort and frustration. These 'costs and risks' might reach such a

level that the required grade for the deposit precluded its likely existence in that locality. A global mining investor would then have to focus on other countries where those problems were reduced in relative terms.

The philosophical point is that man-made social structures can highly distort the development process from the natural order that resources would be extracted if only the physical conditions prevailed. The existence of the former USSR was a case in point where its policies and influence in other parts of the world distorted the allocation of resources according to free market or natural principles.

In the light of the changes that have taken place to the world's political structures, and the modifications being made by countries to their investment policies, geographic borders appear to be becoming more diffuse. The entire process is being given further impetus by the communications networks that transmit information from one side of the world to the other in a matter of seconds. In other words, any political and economic system which is too far 'out of line' (in the negative sense) will be identified very quickly. It would be penalized by the outflow of investment capital, which eventually leads to the emigration of technical and managerial skills.

These conclusions may seem very general but they have been based on the opinions of senior mining executives,

published commentary and a series of quantitative simulations. In essence, the simulation model has enabled the main criteria influencing any mining investment anywhere in the world to be placed in perspective. In fact, the principles could be applied to any industry.

As a final consideration, the lessons of the past, recent changes to global political structures, revisions to investment codes and current information technologies may well herald an era of renewed growth and prosperity. The key to realising this potential will be in the hands of host governments, labour, management and providers of capital and skills. Their individual abilities to identify and implement the necessary structures for wealth creation will be paramount.

6.4 Pointers for Africa

Many of the issues and philosophies discussed in the research report may seem obvious to some people, but then why is Africa still so under-developed? Whatever the reasons being cited from various quarters, such as damage caused by the colonial era, disease etc., there is a problem that has to be solved. If the most important issues, in the opinion of the author, were to be isolated from the study, and in the context of Africa, they would be the following:

- * Create stable political, legal and administrative structures; the latter preferably being independent of 'politics'; under this heading would be the elimination of corruption and self-interest.
- * Monitor critically the policies and investment environments in other regions; they are Africa's competition for investment capital. It appears that even countries have to be run as businesses in today's world of rapid (information) technological advance.
- * Education and training of Africa's populus are an integral part of the process towards the implementation of the above enabling environments.

Needless to say, it is all easier said than done but there are encouraging signs that continent's leaders are beginning to tackle the enormous obstacles that have built up over the decades. It is better late than never.

Time will tell

7.0 RECOMMENDATIONS FOR FURTHER RESEARCH

In the light of the scope of the subject matter it was not surprising that new dimensions and further areas of interest emerged. Brief suggestions for additional research have been presented below with the hope that other researchers may be inspired to expand on the foundations provided.

7.1 Country Risk Analyses

As many as possible of the quantifiable investment criteria impacting on a mining project were incorporated into a calculating framework. The more qualitative aspects, such as politics, legislative and administrative structures were handled intuitively by using the quantitative framework as a base reference point. However, a different approach to measuring risk and return in country investment environments may be contained in the global debt markets. A comparison of the interest rates prevailing on such instruments underwritten by different countries should give an indication of the market's confidence in the structures supporting the investment. Nevertheless, analyses would still need to be carried out as to the reasons for any trends shown so that better predictive bases can be developed.

7.2 Skills Availability in Developing Countries

Considering the flow of mining investment capital to new countries and regions, companies are likely to reassess their strategies and skills' requirements. The problem that arises is the availability of local skills, the amount of training needed and whether the transfer of expatriate skills is warranted, or even allowed by the authorities in various countries. A complication would be that the host governments may stipulate certain labour and training codes, thereby introducing unrealistic constraints which would impact on longer term investment attractiveness.

Research in this area would be extremely valuable in identifying the degree of the problem, designing programmes to alleviate the backlog and, in particular, minimizing the impact of the mixing of cultures.

7.3 Structure of Mining Finance Companies

An extension to the skills availability issue would be the appropriate structures in the mining finance and management companies. The degree to which change will be required would depend on current structures and the extent to which they are geared to a globally diversified mining business profile, e.g. Rio Tinto Zinc (RTZ). An interesting research angle would be the most effective plan to 'globalize' the South African mining houses, with the exception possibly of the Anglo American - De Beers - Minorco triad. Other issues would be the amelioration of past political baggage and the

constraints to the movement of foreign exchange so as to participate competitively in new opportunities.

7.4 Expected Returns on Investment

The executive survey indicated that certain returns on investment would be required before venturing into different countries. There were some very high figures suggested, 30-40 per cent, which places the probability of finding such prospects into the realms of impossibility, assuming a 100 per cent equity-based financing structure. Connected to this was the concept of payback period where 1-2 years was proposed for some regions. In the context of the current global political and economic climate, there is considerable scope to re-think the applicability of these measures in mining project evaluation.

APPENDIX A

NAMES OF EXECUTIVES PARTICIPATING IN THE SURVEY

October - November 1993

U.S. based

Messrs.:

PAUL HANSEN, Manager Corporate Development, Echo Bay
Mines, Denver.

Interviewed: 4th October

DENNIS ARROUET, Chief Financial Officer, Minorco (USA)
Inc., Denver.

Interviewed: 5th October

TOM LOUCKS, Vice-President, Denver Mining Finance Co.,
Denver.

Interviewed: 5th October

WILLIAM PINCUS, Executive Vice President, Pincock Allen
and Holt Inc., International Mineral Resource
Consultants, Denver.

Interviewed: 6th October

TIM HADDON, Chief Executive Officer and President, Amax
Gold, Denver.

Interviewed: 7th October

DOUGLAS SILVER, Senior Partner, Balfour Holdings,
Denver.

Interviewed: 7th October

NAMES OF EXECUTIVES PARTICIPATING IN THE SURVEY

October - November 1993 (U.S. based continued)

Messrs.:

PETER PHILIP, President and Chief Executive Officer,
and;

WAYNE MURDY, Chief Financial Officer, Newmont Mining
Corporation, Denver.

Interviewed: 8th October (both executives)

PETER STEEN, President and Chief Operating Officer,
Homestake Mining Company, San Francisco.

Interviewed: 11th October

OLIVER WARIN, Vice President and Manager Exploration,
BHP Minerals, San Francisco.

Interviewed: 12th October (Completed
questionnaire later)

(Some views were provided by Dr. Cory Williams,
Manager, Exploration, Admin. and Services, who is a
colleague of Mr. Warin)

CLIVE ARMSTRONG, Economist, International Finance
Corporation (World Bank), Washington DC.

Interviewed: 19th October (Completed
questionnaire later)

WILLIAM SMART, Manager - Exploration, Phelps Dodge
(pp. Dr. Pat Ryan) Mining Corporation, Phoenix,
Arizona.

NOTE: Due to prior commitments and the short notice
given by PSA, PD partially completed the questionnaire
and this was received by mail in February 1994.

NAMES OF EXECUTIVES PARTICIPATING IN THE SURVEY

October - November 1993

(continued)

South African based (Johannesburg):

Messrs.:

JOHN HOPWOOD, Executive Director, Gold Fields of S.A. Limited.

Interviewed: 28 October

B. VAN ROOYEN, Executive Director (retired), Gold Fields of S.A. Limited.

Interviewed: 1 November

ROB TAYLOR, Director of Exploration - Africa Division, Rio Tinto Zinc (RTZ).

Interviewed: 4 November

OSKAR STEFFEN, Senior Partner, Steffen Robertson
(Dr.) and Kirsten Inc.

Interviewed: 5 November

Senior executives in three other S.A. mining and related companies were approached to participate but were unable to do so because of work, time and travel pressures. It was decided not to pursue the interview process any further because a consistent base of opinion had been achieved.

APPENDIX B

EXECUTIVE SURVEY: DISTRIBUTION OF CODED RESPONSES

Question topic 2: Global events and situations

Distribution of responses for Table 2.1

Codes	3	2	1	0	Totals
Question:					
2a	9	3	0	1	13
2b	1	7	4	1	13
2c	9	3	1	0	13
2d	0	4	8	0	12
2e	0	5	6	1	12
2f	11	2	1	0	14
2g	6	6	1	0	13
2h	1	2	10	0	13

Question topic 3: Country risk factors

FOR THE EXPLORATION PHASE:

Distribution of responses for Table 2.2

Codes	3	2	1	0	Totals
Question:					
3a	1	2	7	0	10
3b	0	1	8	2	11
3c	0	0	7	4	11
3d	2	3	4	2	11
3e	4	1	2	2	9
3f	1	5	3	1	10
3g	11	3	0	0	14
3h	10	3	0	0	13
3i	12	1	0	0	13
3j	11	2	0	0	13
3k	9	2	2	0	13
3l	10	2	1	0	13
3m	12	1	0	0	13
3n	12	0	0	0	12
3o	9	2	1	0	12
3p	3	4	5	0	12
3q	3	3	4	0	10
3r	3	2	6	1	12
3s	4	2	4	2	12
3t	0	2	7	3	12

NOTE: The questionnaire differentiated between exploration and production phases but several executives viewed the two in the same light. This is the reason the number of counts for the production phase (overleaf) were lower.

Question topic 3: Country risk factors (continued)

FOR THE PRODUCTION PHASE:

Distribution of responses for Table 2.2 (continued)

Codes	3	2	1	0	Totals
Question:					
3a	3	3	0	0	6
3b	0	2	4	1	7
3c	0	4	2	1	7
3d	0	0	4	3	7
3e	2	0	2	2	6
3f	1	4	2	0	7
3g	6	1	0	0	7
3h	5	2	0	0	7
3i	5	2	0	0	7
3j	6	1	0	0	7
3k	4	2	1	0	7
3l	5	2	0	0	7
3m	6	1	0	0	7
3n	5	1	0	0	6
3o	3	3	0	0	6
3p	2	2	3	0	7
3q	2	2	2	0	6
3r	3	1	3	0	7
3s	5	0	1	1	7
3t	0	1	5	1	7

PROJECT EVALUATION METHODS

Codes	3	2	1	0	Totals
Question:					
3u	4	5	1	0	10
3v	2	6	2	0	10
3w	8	4	1	0	13
3x	6	3	3	0	12
3y	5	4	1	0	10

Question topic 4: Exploration attractiveness

FOR THE 1990's:

Distribution of responses for Table 2.4

Codes	3	2	1	0	Total
<u>Africa</u>	1	5	4	2	12
Angola	0	0	3	7	10
Ghana	4	2	2	2	10
RSA	2	3	3	2	10
Zaire	0	0	3	7	10
Zambia	1	3	3	3	10
Zimbabwe	1	3	4	2	10
<u>Lat. America</u>	11	1	0	0	12
Argentina	6	2	0	0	8
Brazil	0	3	3	2	8
Chile	9	0	0	0	9
Mexico	6	2	0	0	8
Peru	2	4	2	0	8
<u>Pacific Rim</u>	3	6	1	0	10
Indonesia	4	2	1	0	7
Malaysia	3	1	2	1	7
Papua N.G.	0	2	5	1	8
Philippines	0	2	3	2	7
Vietnam	1	3	1	1	6
<u>Others:</u>					
Australia	3	5	3	0	11
Canada	0	7	4	0	11
China	2	3	3	3	11
CIS	4	5	1	1	11
USA	2	8	1	0	11
WORLD INDEX	50	60	47	34	191

NOTE: Some executives preferred to give responses for regions only which explains the number of counts being higher than those given for the individual countries.

Question topic 4: Exploration Attractiveness (cont.)

FOR THE 1980's:

Distribution of responses for Table 2.4 (continued)

Codes	3	2	1	0	Total
<u>Africa</u>	0	2	5	5	12
Angola	0	0	1	9	10
Ghana	0	1	5	4	10
RSA	1	3	3	3	10
Zaire	0	0	4	6	10
Zambia	0	0	2	8	10
Zimbabwe	0	3	2	5	10
<u>Lat. America</u>	0	4	8	0	12
Argentina	0	0	2	6	8
Brazil	1	2	3	2	8
Chile	3	3	1	2	9
Mexico	1	2	3	2	8
Peru	0	0	2	6	8
<u>Pacific Rim</u>	2	3	4	1	10
Indonesia	4	0	1	2	7
Malaysia	2	1	3	1	7
Papua N.G.	3	4	0	1	8
Philippines	0	2	4	1	7
Vietnam	0	0	1	5	6
<u>Others</u>					
Australia	5	4	1	0	10
Canada	5	4	1	0	10
China	0	0	1	9	10
CIS	0	0	1	9	10
USA	8	2	0	0	10
WORLD INDEX	33	31	41	81	186

Question topic 5: Rates of return and payback period

For the 1990's and 1980's: Number of responses given for IRR and PBP in selected countries:

	IRR	PBP
<u>Africa</u>	7	6
Angola	6	5
Ghana	6	5
RSA	6	5
Zaire	6	5
Zambia	6	5
Zimbabwe	6	5
<u>Lat. America</u>	7	7
Argentina	5	5
Brazil	5	5
Chile	5	5
Mexico	5	5
Peru	5	5
<u>Pacific Rim</u>	6	6
Indonesia	4	4
Malaysia	4	4
Papua N.G.	4	4
Philippines	4	4
Vietnam	4	4
<u>Others</u>		
Australia	7	7
Canada	8	7
China	5	5
CIS	6	6
USA	8	7

NOTE: Although not all executives gave their expectations of IRR and PBP, most of the others indicated that their estimates would reflect the same trends as those given for question topic 4.

Question topic 5: Rates of return and payback period

For the 1990's and 1980's: Number of responses given for IRR and PBP in selected countries:

	IRR	PBP
Africa	7	6
Angola	6	5
Ghana	6	5
RSA	6	5
Zaire	6	5
Zambia	6	5
Zimbabwe	6	5
 Lat. America	7	7
Argentina	5	5
Brazil	5	5
Chile	5	5
Mexico	5	5
Peru	5	5
 Pacific Rim	6	6
Indonesia	4	4
Malaysia	4	4
Papua N.G.	4	4
Philippines	4	4
Vietnam	4	4
 Others		
Australia	7	7
Canada	8	7
China	5	5
CIS	6	6
USA	8	7

NOTE: Although not all executives gave their expectations of IRR and PBP, most of the others indicated that their estimates would reflect the same trends as those given for question topic 4.

EXECUTIVE SURVEY: DETAILS OF THE COMMENTS AND OPINIONS

The following pages provide more detail on the opinions given by the executives during the interviews. The write-up has been laid out to simulate the chronology of the interviews. This approach may allow interpretations to be made by the reader which could well be different to those of the author.

Specific comment(s) or opinion(s) made by a particular executive is (are) highlighted with a pointer sign (>) and the subscribing executive(s) identified with numbers, e.g. Executive 1,2 or 3 etc. It was decided not to identify each executive by name purely to protect any confidential views, as mutually agreed at the time of the interviews.

Different respondents did make similar comments and these may border on repetition in the following notes. Where possible the identification numbers of the executives have been attached to the common opinion.

Question topic 1: Setting the scene

The following comment has been drawn from Anglo-American Corporation's 1993 annual review: "The changes taking place in (South Africa and) much of the world beyond us have widened the Corporation's horizons, offering the prospect

of a challenging and dynamic period of renewed growth". Do you agree that this comment could apply to your company?

Executives' comments and opinions

Executive 1:

> The world is a very different place now with advances being made in various technologies and the developed economies being less materially (copper, zinc etc.) intensive. However, the search for the "elephants" or world class mineral deposits is likely to intensify and ways will be found to develop these, subject of course to political stability or war situations.

Executive 2:

> There is currently a "push-pull" scenario influencing the strategies of U.S. based firms. The "push" comes from pending changes to the U.S. Mining Law of 1872 which potentially means additional royalties on minerals extraction and increased costs or provisions for environmental protection. The "pull" stems from the reformation of Latin American investment codes which have enhanced the potential returns on foreign capital and makes the region far more attractive to investors.

Executive 3:

> The end of the West vs. East "Cold War" has resulted in socialism and nationalism losing their historic support base. This has allowed "free market"

ideologies to take hold and enables an intense drive to find and develop more capital efficient and lower cost resources. The environment has also raised questions about the efficiency of state owned enterprises, with the trend towards privatization becoming a natural extension.

PSA comment: These ideological issues were repeated by numerous executives throughout the discussions.

> Latin America, particularly Peru, is a good example of this trend with various other countries having sold, or are in the process of selling off, their mining assets to private capital and management expertise which are considered to be more efficient.

Executive 4:

> The current process of change is translating into a transfer of wealth from the developed to the developing nations.

> Colonialism was a major factor in the early to mid part of this century because the influence and control of an economic power block maintained a stable operating environment, e.g. Britain, France, and Germany. Now the companies themselves are having to play a more pronounced role in this regard, which essentially is the management of the risks associated with unfamiliar and volatile environments. Part of the process is for companies to ingratiate themselves with host governments. The formation of the multi-

lateral agencies, such as the World Bank/IFC, has also assisted in this regard.

Executive 5:

> Approximately another 50 per cent of the world has opened up under this new status quo of rejuvenation and privatization. This realization began setting in around 1986-1987 when many countries started changing their investment and tax codes to maintain competitiveness in the global business environment.

Executives 6, 12, 14 and 15:

> "Privatization" is believed to be the greatest driving force in mineral development to-day, i.e. after the collapse of the former USSR and the repercussions from this across the globe.

Executive 7:

> Changes have taken place, both pro and con, in mining investment laws and environmental legislation worldwide.

Executive 8:

> Considerable more preparation and exploration work has to be carried out before the growth phase can be realized.

(PSA comment: This was the reason for the only "no" response given for question topic 1.).

Executive 9:

> The financial capacity of companies to realize these opportunities is going to be a major factor. (Ex. 9)

Executive 11:

> In the context of U.S. consulting work, 10-20 per cent was offshore based between 3 - 5 years ago and currently it is more like 50 per cent.

Question topic 2: Global events and situations

The following situations appear to be influencing trends in international mining investment. What is your view of the degree of impact each has had, or is likely to have, on these trends? Enter codes for major (3), moderate (2), minor (1), or no impact (0).

Executives' comments and opinions

Executive 2:

> Elimination of dictatorships or centrally controlled ideologies appears to be an international objective and to a large extent has been successful.

> There is an appreciation in business circles of the influence wielded by the World Bank, IFC and OPIC organizations so that sound economic and business principles are adhered to in the developing world.

Executive 3:

- > The pending changes to the U.S. Mining Law of 1872 creates an atmosphere of uncertainty in the mineral development process.
- > The business climate is very different now (compared to the recent past) and strategies for mineral investment and development need to be modified accordingly.
- > "Native rights" seems to be an emerging factor which mining finance firms should be cautious about, e.g. Mabo title case in Australia and the analogous North American Indian.
- > The privatization trend has been the natural extension to the major events mentioned above, i.e. the demise of the former USSR etc., and is arguably the most important "ideology" to have emerged in recent history.
- > The changes in South Africa are of major significance to local S.A. mining companies, and probably to Africa at large, but it is not likely to affect non-South African firms that much.
- > The mining industry's image appears to have been tarnished in the industrialized countries. This differs from the developing countries where perceptions of the mining industry are far more positive. An issue which is not often appreciated is that this also affects the quality of individual attracted to the industry as an employer.
- > MIGA (Multi-lateral Investment Guarantee Agency), the World Bank and IFC have contributed to the globalization of the mining industry through

consolidating the ability to mitigate the risks in financing mining projects, particularly on behalf of private capital and technical services providers.

Executive 4:

- > The full effects of the collapse of the former USSR are still evolving and will probably continue to do so for many years to come. The impact of the modernization of China is likely to take considerably longer to be felt on a global scale. The latter's transition seems to be better controlled.
- > The major changes to Latin America's investment codes have taken place already.
- > The problems the mining industry has experienced with the environmental "lobby" have been partly its own doing. There should have been a far more coordinated and determined effort to present the mining industry's perspective.

Executive 3:

- > Popular opinion and support for the First World mining industry is declining, i.e. the "ugly scar" on the surface syndrome, which has resulted in an attraction to the less developed countries because of their less "hyped up" profiles. Philosophically, it is the lack of understanding in the developed world of the importance of mineral supplies to the welfare of advanced societies because those people have become detached over time from the primary industries.

Executive 11:

> The attention to environmental issues in the developed world will raise the costs of extracting minerals which eventually must impact on commodity prices. The notion that environmental controls will be less onerous in the developing world could be misguided because many of the technical skills originate in the developed countries and the same standards are likely to be applied elsewhere. Furthermore, the majority of financial institutions and providers of capital require Environmental Impact Assessments before agreements to develop mineral projects can be finalized.

Executive 14:

- > One of the powerful motivations for privatization is the need to attract foreign investment and capital towards the developing countries.
- > The mining industry is one of the better mediums through which wealth can be created in the lesser developed countries.

The most important event(s)

Which situation(s) above, in your opinion, has(ve) had (or will have) the most dramatic impact on trends in mining investment? Please enter a. and b. etc. and include a brief explanation for your choice.

Executives' comments and opinions (to qualify the choices)

Executives 1, 8, 10:

> Latin America (c.) is a very prospective area currently and is highly likely to host further world class deposits.

Executive 2:

> U.S. capital follows the path of least resistance, i.e. Latin America (c.) and its more attractive investment regulations versus increased environmentalism and "political" costs of mining development in North America.

Executives 3 and 13:

> Latin America (c.) certainly presents some worthwhile opportunities but, as an overall observation, the worldwide trend towards free-markets and privatization (f.) has had the greatest influence on the current operating environment.

Executive 4:

> The CIS (a.) still attracts much attention and its enormous potential tends to outweigh the current political and economic instability. Our company, however, is not exposing substantial capital until the region is better understood.

Executive 5:

> In the short term, the structural change in the former USSR (a.) because it changes attitudes throughout the Third World and, in the long term, the influence of China (b.) because of its potential to become a new industrial society (comparable to Western Europe) in the western Pacific.

Executives 6 and 14:

> In the short term, privatization in Latin America (c. & f.) and in the longer term, the changes (a.) in the former USSR. In other words, financing and competitiveness are likely to be generated by market economy policies rather than the socialist doctrine.

Executive 7:

> The changes in Latin American (c.) investment environment and the U.S. Mining Laws of 1872 (d.) have caused the greatest shift in exploration spending and mining investment.

Executive 9:

> The environmental sensitivity issue (g.) tends to have a major impact on mining investment decisions from a U.S. perspective - actual mining is the easy part!

Executive 11:

> The investment climate in Latin America (c.) and privatization (f.) have been the most influential factors.

Are the 1990's riskier ?

Do you believe that the current 1990's mining investment environment is riskier than at any other time during your professional experience?

Executives' comments and opinions

Executive 1:

> Riskier? , "yes and no", because of the excess of capital being available (low interest rates at the time) which could be a result of perceptions of increased risk and the consequent delay in applying those funds for investment in the unstable regions.

Executive 2:

The global mining investment environment is not riskier due to:

- > the influence of multi-lateral agencies, i.e. World Bank, IFC, and MIGA which helps to manage the ever-changing risk profiles of developing countries.
- > governments competing fiercely for foreign investment capital.
- > many politicians being educated in the "western" culture, particularly in Latin America, and this facilitates the business development process.
- > the global "village" mentality is growing as markets open up, which is mostly driven by the Japanese.

Executive 3:

- > "Undecided" because of a new range of risks, but these are generally manageable with World Bank/IFC and MIGA support.
- > It is easier to structure finance packages to counter the risks involved and this can also reduce the amount of up-front risk capital by equity participants.

Executive 4:

- > A riskier environment because of the increased number of investment alternatives. This requires far greater attention to the dynamics of the investment environment and to the allocation and management of resources.

Executive 5:

- > The environment is not riskier because the threat of nationalization (state interference) has diminished and environmental problems can generally be resolved before major investments are undertaken.

Executive 6:

- > The 1990's is riskier than the 1960's but not necessarily the 1970-80's.

Executive 7:

- > "Undecided" because many of the countries undergoing major change have to finish "playing out their hands".

Executive 8:

- > Riskier because the operating environment is in a greater state of flux. The new "rules-of-the-game" have to be understood and appropriate strategies implemented.
- > Another dimension to investors' risk exposure is that developing countries are in somewhat of a quandary because of the stiff competition in setting policies progressive enough to attract foreign investment.

Executive 9:

- > There is a more complex environment now with a new set of risks. Success will be realized through the management of information, its interpretation and implementation of commensurate strategies.

Executives 11 and 13:

- > There probably is more risk but current technology and financing structures, such as information technologies and the IMF etc., are far better equipped to manage the uncertainties.

Executives 12 and 14:

- > Definitely not any riskier in the 1990's because appropriate actions can be taken to alleviate the risks.

Executive 15:

- > On balance a riskier environment because of the unknown mineral resources and potential of Eastern

Europe and the former USSR which could have major repercussions globally.

Question topic 3: Country risk factors

The following factors are consistently cited as the more important contributors to the success of mineral projects (assuming that the project specific factors such as geology, grade etc., are considered favourable). What is your view of the importance of each factor in firstly, the exploration phase and secondly, the production phase? Enter codes for major (3), moderate (2), minor (1), or no importance (0).

Executives' comments and opinions

Executives 1, 4, 5, 9, 11, 12, 13, 14 and 15:

> In the context of most of the above factors, the exploration and production phases should be treated in the same light. Essentially, the investment code and related conditions are evaluated very carefully before even commencing field exploration.

Executives 1, 4 and 13:

> Predictability and transparency of investment policies and codes are major factors contributing to the development of a mining industry or project. It makes it easier to focus on managing projects which often are difficult enough for technical reasons.

Executives 3 and 8:

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> Safety of employees is of paramount importance and our firm(s) is (are) not prepared to make sacrifices in this regard.

Executive 3:

> Involvement of more equity partners can often be more trouble than it is worth.

Executives 3, 4 and 14:

> Environmental standards appear to be moving towards more uniformity on a global scale.

Executive 5:

> It is extremely important to have a sound investment code framework around which negotiations can take place before exploration begins.

Executive 9:

> The stability and type of relationship with the host government is of extreme importance. Look at the example of Papua New Guinea where there have been numerous disputes between multi-nationals, local interest groups and the government.

> A possible method of comparing country risk would be to analyze the cost (interest rates) of debt vis-à-vis the more stable, industrialized countries.

Executive 12:

> Insurance cover via MIGA and OPIC does not come cheaply, constituting up to 10% (?) of revenues.

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> Insurance cover via MIGA and OPIC does not come cheaply, constituting up to 10% (?) of revenues.

Executive 14:

>A ranking of the important factors would be as follows:

1. Geological potential.
2. Mining code and security of tenure.
3. Commercial terms.
4. Socio-economic conditions (culture, native lands, political stability).

Executive 12 and 14:

>An observation that the importance of infrastructure is a function of the value : bulk ratio of the commodity being produced. In other words, the higher the value of the product the less sophisticated the infrastructure that is likely to be required.

Project evaluation methods

Assuming the factors listed above have been assessed as favourable, how would you rate the following evaluation methods in the investment decision making process? Enter codes for essential (3), useful (2), of little use (1) or no use (0).

Executives' comments and opinions

Executives 3 and 8:

The potential impact of a project on corporate performance and image is important, in the sense of adding to or detracting from the sum of the corporate parts.

Executives 1, 13 and 14:

The "bottom-line" in project evaluations is the relative operating cost on a global basis, but of course cognizance has to be taken of the capital cost as well.

Executives 4 and 13:

Much attention currently is given to the payback period because of the new risks that have to be considered in relatively unexplored and developing regions.

Question Topic 4: Explorat. attractiveness

What would be your degree of interest in commencing an exploration programme in the following regions and countries, firstly in the current 1990's decade and then, for comparison, assuming the environment that was prevailing in the 1980's? (If there is no change in a particular case then leave the 1980's space blank). Enter codes for strong (3), moderate (2), weak (1) or no attraction (0).

Executives' comments and opinions

Although the coded responses in Table 2.4 show relatively the areas of interest for exploration potential, additional comments that were made in the discussions:

Executives 1 and 3:

- > The environmental management costs in Canada are not competitive compared with many other regions. Even then there are provincial differences, with British Columbia being the most "anti".

Executive 8:

- > Experience in the Canadian northern territories may be of considerable value in the CIS where climatic conditions are similar, i.e. reducing the impact of the learning curve.

Executive 14:

- > Africa's potential is attractive but the practicalities of carrying out the business of mineral development in many countries is daunting.

Question topic 5: Rates of return (IRR) on investment and payback period

Assuming a risk free internal rate of return (IRR), i.e. government bonds etc., as the base reference point, what premium return (in percent) and then payback period (PBP) would entice you to invest in a 'world class' deposit in the following regions and countries? Also, in similar fashion to question topic 4., indicate the measures you would have expected in the 1980's (leave blank if no difference).

Executives' comments and opinions

The comments offered in question topic 4 on exploration attractiveness also apply to this analysis of IRR and PBP but other views that were put forward on question topic 5:

Executive 1:

> The value per ounce of gold reserves has always been greater in the USA, than say South Africa, which makes it far easier to attract capital. It is not so much that the value has declined in the USA, even with the more uncertain mining investment climate, but that the value has increased in developing regions due to the changes being made to their investment and mining codes,

Executives 3, 4, 14 and 15:

> The IRR and PBP figures, although different concepts to the coded responses in question topic 4, should reflect the same trends.

Executive 9:

> Theoretically, risks should be reduced in unfamiliar regions by involving local partners.

Executive 10:

> One of the major problems with doing business in less developed Africa is the inefficiency and time delays in receiving approvals and permits, let alone the long term stability of such contracts. West Africa is

probably the most attractive region and deposits close to the coast are preferred!!

Executive 12:

As a general rule, investing in foreign projects would require a return double that expected in the home environment. (Interestingly, this comment was made by a South African respondent)

QUESTION TOPICS 6 and 7: INCOMPLETE RESULTS

The following two topics were discussed in the interviews but it was found that more time was needed to complete the responses adequately. They have been included here as a matter of record only.

Question Topic 6

Looking forward 20 years where (region or country) would you expect the greatest change in production of the following commodities to have taken place?

<u>Commodity</u>	<u>Growth</u>	<u>Decline</u>
Gold		
Copper		
Nickel		
Iron Ore		

If you were presented with four "world class" deposits each to produce one of the following commodities, what would be your order of preference for development in each of the given regions? Rank from 1 through 4 horizontally

<u>Commodity</u>	<u>Gold</u>	<u>Copper</u>	<u>Nickel</u>	<u>Iron Ore</u>
		(Concs.)	(Concs.)	
Africa				
Australia				
China				
C.I.S.				

Latin America
Pacific Rim
USA

Question Topic 7

In the context of the operating and investment environment during the 1990's compared with that of the 1980's, what change in emphasis do you envisage in respect of various disciplines in the following three areas :

- A. your company's skill's complement?*
- B. relocation of these skills to other regions or countries?*
- C. usage of external consultants and professionals?*

Enter codes for: Stronger emphasis (2), less emphasis (1), leave unchanged (0).

<u>Discipline</u>	<u>A.</u>	<u>B.</u>	<u>C.</u>
Geological			
Engineering/technical			
Accounting/financial management			
New business and development			
Corporate financial			
Legal			
Personnel or human resources			
Marketing, price hedging			
Information technology			
Environmental			

EXCERPT FROM OTTO'S SURVEY RESULTS (AS REPRODUCED)
(OTTO, 1992, pp. 337-338)

Column 1: Match with headings in Table 2.6		Exploration parameters			Mining projects		
		Very Important	Important	Not very Important	Very Important	Important	Not very Important
	Geological criteria						
	General mineral abundance	15	18	4			
	Geological potential for large minerals	34	5	0			
d	Availability of geoscientific information	7	27	4			
d	Historical production	4	16	16			
	Ability to apply geological assessment techniques	22	13	3			
	Rarity of predicted mineral deposits	2	7	23			
	Political criteria						
g	Long-term national stability	22	17	0	23	11	0
g	Regime stability	14	21	2	14	16	2
g	Consistency and constancy of mineral policies	30	9	0	27	6	1
	Internal conflicts	20	16	1	18	14	0
	Hostile borders	16	17	3	15	14	2
	Others: democratic - 1; security of personnel - 1						
	Marketing criteria						
	Geographic location	9	20	8	11	18	6
	Presence of internal markets	1	6	30	0	13	22
	Transportation infrastructure	11	17	9	14	18	3
	Export/import policies	22	9	6	24	9	2
	Regional trade agreements	3	10	24	7	10	21
	Demand/price forecasts	11	10	14	14	8	11
	Regulatory criteria						
h	Modern mineral legislation	19	14	5	20	11	4
h	Stability of exploration/ mining terms	26	11	1	29	7	0
h	Mineral ownership	27	7	4	26	6	3
	Surface/land ownership	18	13	7	16	15	4
n	Security of tenure	32	6	0	34	2	0
	Established mineral titles system	22	14	2	22	12	2
	Right to transfer ownership	20	17	1	15	18	2
	Size of exploration blocks	11	15	10			
	Availability of a mineral agreement to supplement or stand in place of the mining code	11	17	6	10	14	5
	International arbitration	9	16	11	9	15	6
	Fiscal criteria						
m	Method and level of tax levies	22	12	2	25	10	0
m	Ability to predetermine tax liability	26	10	0	29	6	0
	Availability of tax holiday	6	16	13	9	17	9
	Availability of accelerated depreciation	8	17	10	9	22	4
	Availability of reinvestment credits	3	16	16	1	23	11
	Stability of fiscal regime	23	11	1	26	7	0

Column 1: Match with headings in Table 2.6		Exploration programmes			Mining projects		
		Very Important	Important	Not very Important	Very Important	Important	Not very Important
m	Tax treaty with home country Expatriates exempt from income tax	7 4	17 7	11 25	10 3	16 6	9 26
	Monetary criteria						
j	Realistic foreign exchange regulations	26	11	0	28	8	0
j	Permitted external accounts	20	12	5	25	10	1
	Ability to repatriate profits	31	4	2	34	2	0
	Ability to raise external financing	23	9	5	24	11	1
	Others: exchange rate stability - 1; no withholding tax - 1						
	Environmental criteria						
p	Environmental regulations	9	24	5	14	17	4
p	Ability to predetermine environment-related obligations	23	14	1	27	7	0
	Antismining groups	7	17	13	6	21	6
	Relative sensitivity of environment	10	20	7	14	16	2
	Operational factors						
f	Prior company experience in the country	2	13	23	3	18	14
i	Majority equity ownership held by company	21	12	6	20	12	4
i	Company has management control	27	9	2	27	7	2
a	Established infrastructure and utilities	4	21	12	8	23	4
b	Favourable climate	1	6	29	2	6	27
	Physical lay of the land	1	13	23	2	10	23
c	Availability of experienced local workforce	3	18	15	5	25	4
	Availability of fabrication/maintenance services	2	16	19	6	19	9
	Availability of local geotechnical services	1	14	22	1	13	22
	Common spoken language	2	13	21	2	13	20
s	Availability of foreign investment insurance	8	8	21	6	11	17
	Others: importing exploration equipment - 1; no free carried interest - 1						
	Profit criteria						
	Internal rate of return				30	7	0
	Not present value				25	9	3
	Break-even year				17	14	5
	Return on investment				27	8	1
	Competitive cost index				21	12	2
	Others: accounting return - 1; total revenue - 1						

Number of companies responding 39

Note: Not all companies indicated a response for every criterion

MINING JOURNAL DATA ON GOLD PRODUCERS

To Compare Market Capitalisation per Ounce Produced
and Costs of Production : RSA Producers vs. the Rest

DATA FOR GRAPH

IN FIGURE 2.3

Gold Producer	Principal Production Area(s)	Annual Gold Prod.	Cost of Prod.	Market Capitalisation	Market Cap. per Ounce	Revenue from Gold	Shares in Issue	Average Share Price (p)
		'000 oz.	US\$/oz	US\$ million	US\$/000		millions	US\$
Blyvooruitzicht	RSA	161.2	403	38.2	0.24	98%	24.00	1.59
Buffelsfontein	RSA	331.3	373	80.4	0.24	90%	11.00	7.31
Doornfontein	RSA	111.1	440	31.2	0.29	92%	40.00	0.81
Lorraine	RSA	197.9	391	59.6	0.30	97%	16.37	3.64
Lesotho	RSA	83.8	312	26.0	0.31	100%	16.00	1.60
Grosveld	RSA	78.3	343	26.0	0.33	100%	11.44	2.28
Harmony	RSA	660.6	350	235.3	0.36	95%	26.88	8.76
Winkelhoek	RSA	313.6	312	140.1	0.45	99%	12.18	11.51
St. Helena	RSA	176.1	295	81.6	0.46	96%	9.63	8.47
Wessgold	RSA	3249.1	320	1509.5	0.46	98%	138.98	12.69
Hortebroekfontein	RSA	804.3	292	445.2	0.50	100%	112.00	3.98
Umsel	RSA	133.5	297	70.8	0.53	100%	28.05	2.53
Deelkraal	RSA	233.5	355	128.4	0.55	96%	99.54	1.29
Southvaal	RSA	1161.3	264	659.5	0.57	95%	26.00	25.37
Brandfontein	RSA	389.8	289	586.2	0.57	97%	81.38	8.38
Vaal Reef	RSA	2216.2	280	1566.2	0.62	96%	19.11	71.49
BRPM	RSA	246.9	373	153.8	0.62	99%	149.36	1.03
Klarus	RSA	345.2	268	239.7	0.69	99%	18.00	13.32
BT Consolidated	RSA	97.2	344	77.3	0.79	97%	86.33	0.90
West. Deep Levels	RSA	1191.3	300	859.6	0.81	97%	27.73	34.63
Angold	RSA	2638.7	279	2176.2	0.89	97%	24.15	90.11
Western Areas	RSA	542.7	288	576.8	1.06	94%	40.31	14.31
Kloof	RSA	1851.8	251	1702.0	1.10	100%	138.60	12.28
Elandsrand	RSA	499.4	271	551.3	1.10	98%	96.98	5.69
Wenters	RSA	431.5	300	844.0	1.21	100%	94.00	6.08
Driefontein	RSA	1941.3	191	2741.8	1.41	96%	204.00	13.44
Jod	RSA	114.8	390	222.4	1.94	100%	195.96	1.14
Dominion	Australia	272.0	336	82.5	0.30	96%	434.15	0.19
Cambior	Canada/Guyana	518.2	277	521.2	1.01	94%	49.01	10.64
Midcon	Australia	267.3	292	213.9	1.02	99%	125.00	1.70
Royal Oak	Canada	338.9	322	370.4	1.09	100%	114.49	3.24
Poosden Gold	Australia	818.0	218	1042.0	1.27	95%	57.71	1.81
Newcrest Mining	Australia	666.6	280	896.0	1.34	100%	230.93	3.88
Echo Bay Mines	USA/Canada	747.5	247	1093.8	1.46	100%	112.70	9.71
Homestake	USA/Canada	1568.5	262	2317.8	1.48	92%	137.82	16.82
Santa Fe Gold	USA	938.7	184	1469.9	1.57	96%	131.36	11.19
GM Kalgoorlie	Australia	461.8	265	759.1	1.64	100%	954.86	0.80
Battle Mountain	USA/Canada	486.0	202	855.0	1.76	97%	80.93	10.57
Amex Gold	USA mostly	240.8	340	432.1	1.79	100%	81.30	5.32
Homestake Gold	Australia	393.8	280	636.2	1.80	100%	591.88	1.08
Highlands Gold	Australia	237.6	159	429.1	1.81	97%	564.55	0.76
Aurora Gold	Australia	89.9	299	168.8	1.88	100%	160.00	1.06
Placer Pacific	Australia	780.1	194	1503.0	1.93	99%	624.94	2.41
Sons of Canada	Australia	140.1	186	275.4	1.97	93%	71.35	3.86
Newmont Gold	USA/Canada/Peru	1665.2	208	3461.0	2.08	100%	86.96	35.98
Ashanti	Ghana	906.8	167	1926.3	2.12	100%	83.90	22.96
PMC Gold	USA	125.0	264	266.4	2.13	99%	73.48	3.63
Hemlo Gold	Canada	470.8	112	1012.7	2.15	100%	99.82	10.14
Plutonic Res.	Australia	327.1	249	759.7	2.32	100%	180.02	4.22
Delta Gold	Australia	443.8	274	388.2	2.78	99%	202.73	1.92
Agnico Eagle	Canada	112.2	160	428.3	2.83	91%	39.53	10.84
TVX Gold	N & S. America	1.6	206	1084.9	3.00	100%	160.02	6.78
Barrick Gold	USA/Canada explor. China/Lat. Am.	14.0	171	8015.1	3.10	100%	353.40	23.68
Total northern African		662.1	286.6	15369.5	0.76			
Total 'the Rest'		15588.3	218.9	30406.1	1.95			
Grand Totals		35870.7	257.2	45775.6	1.28			

(p) Average of 1995
high and low prices.

Source of data: Mining Journal Gold Service (1995), Vol. 39, No. 1, May.

NOTE: Most non-S.A. based companies listed above have
exploration programmes in other regions at varying stages.

	F	G	H	I	J	K
1	COUNTRY CRITERIA	NB: Blocked or shaded cells indicate conditions are attached. Refer to notes as per respective cell addresses.				
2	SIMULATION MODEL					
3						
4	COUNTRY CRITERIA MODULE					
5						
6	CRITERIA HEADINGS	CHILE				
11	WORKS INCLUDE	NOTES				
14						
15	COUNTRY INFLATION RATE	10.0%				
20						
21	EXCHANGE RATE (PER US\$)	0.40 PESO x 1000 PER US\$				
43						
44	COUNTRY SPECIFIC FACTORS					
45		MIN. MAX.				
46	PROD. ROYALTY ON COPPER	0.0% 0.0%				
47	PRICE RANGE	\$0.00 \$0.40				
48	PROD. ROYALTY ON GOLD	0.0% 0.0%				
49	PRICE RANGE	\$0 \$0				
50	EXPORT ROYALTY	0.00%				
51	TAX ON ALLUVIAL GOLD	0.0% 0.0%				
52						
56	SALES TAXES / VAT	VAT 0.0% ZERO RATED				
58	SOCIAL SECURITY CHARGES	2.0% 3.0%				
59	TRAINING EXPENSES	1.0%				
61	CUSTOMS DUTIES	13.3%				
64	LAND/BUILDING TAXES	0.3%				
65	DEAD RENT	\$0.0 \$0.0				
66	STAMP DUTIES	0.3%				
67	REAL / STATE TAX	2.0%				
68	CAPITAL TAX	0.00% 0.00%				
69	MINING CONCESSION FEES	3.37 4.33				
70	EXCISE TAX: AUTO FUEL	2.40				
71	EXCISE TAX: DIESEL	3.00				
72						
77	ROYALTIES (NON-GOVN.)	2.3%				
80						
81	CORPORATE TAX REGIME					
82						
86	COMPANY TAXATION	SEE TAX NOTE BELOW				
90	TAX CREDITS					
92	ADDITIONAL PROFITS TAX	SEE APT NOTES BELOW				
93	PROVINCIAL/LOCAL TAXES	0.0%				
97	INTEREST CHARGE BY LOCAL BANK	30.0%				
98	EMPLOYEES' SHARE OF PROFITS	30.0%				
99	PERCENTAGE OF INCOME	25.0%				
100	MAXIMUM BONUS AMOUNT	4.75 \$525.5				
105						
106	WITH-HOLDING TAXES ON:					
107						
108	DIVIDENDS: SUBSIDIARY	INCLUDED IN 0.0% CORPORATE TAX AMOUNT				
109	DIVIDENDS: BRANCH	0.0%				
110						
111	ROYALTIES: NON-ASSOC.	0.0%				
112	ROYALTIES: ASSOCIATE	0.0%				
113						
114	LOAN INTEREST	4.0%				
115						
116	MANAGEMENT FEES	30.0%				
117	(to non-residents)					
118	ROYALTIES TO LANDOWNERS	0.0%				
169						
170	EQUITY AND LOAN FINANCE SCHEDULE					
171		NOTES				
172						
173						
222						
223	TAXATION CALCULATION SCHEDULE	NOTES				
224		NOTES				
225						
226	MONTHLY TAX UNIT	46.1				

	F	G	H	I	J	K
1	COUNTRY CRITERIA	NB: Blocked or shaded cells indicate conditions are attached. Refer to notes as per respective cell addresses.				
2	SIMULATION MODEL					
3						
4	COUNTRY CRITERIA MODULE					
5						
6	CRITERIA HEADINGS	CHILE				
236		INV. REC. PERIOD	NORMAL STATUS	OTHER FACTORS		
237	TAXATION RATES:	35.0%	35.0%	0		
238	SUBSIDIARY					
239	BRANCH	35.0%	35.0%			
240	SURCHARGES			0.0		
241	ALLOWANCE ON CAPEX: TAX %			0.0		
319						
320	CONDITIONAL TAX CALCULATIONS					
321						
323	INVESTMENT RECOVERY PERIOD	3 MONTHS				
324	TARGET INCOME	15%				
326						
327	ADDITIONAL PROFITS TAX (APT)	5%				
328	NET CASHFLOW (EXCLUDING INTEREST & DEPREC.)	12.0%				
329	NPV AT US PRIME + STIPULATED % P.A.					
330						
333	ANNUAL LOSS COUNTER	200 YEARS				
338	DEPLETION ALLOWANCES:					
339	GOLD & SILVER SALES	0.0%				
340	OTHER METALS/MINERALS	0.0%				
341						
342						
343						
344	CAPITAL EXPENDITURE SCHEDULE					
345		UNEQUAL LIVES IN YEARS	STRAIGHT LINE	DECLINING BALANCE		
346			1.00	0.00		
347		5 YEARS	FLAG Y = 1.00			
348						
349	MINING MACHINERY/PLANT	10	33.3%	0.0%		
350	SMELTING/REFINING PLANT	10	33.3%	0.0%		
351	BUILDINGS, MINESITE PREP.	25	12.5%	0.0%		
352	SHIPS/STEAMERS	10	33.3%	0.0%		
353	EARTHMOVING EQUIP.	10	33.3%	0.0%		
354	BUILDINGS/STEEL	10	12.5%	0.0%		
355	BUILDINGS:WOOD, PRE-FAB.	5	100.0%	0.0%		
356	MAG. SURVEY EQUIP.	10	33.3%	0.0%		
357	COMPUTERS	5	100.0%	0.0%		
358	FURNITURE/FITTINGS	5	100.0%	0.0%		
359	OTHER OFFICE EQUIP.	5	100.0%	0.0%		
360	MOTOR VEHICLES	10	33.3%	0.0%		
361	CONCRETE MIXERS	10	33.3%	0.0%		
362	RAMMERSON VIBRATORS	10	33.3%	0.0%		
363	CRANES	10	33.3%	0.0%		
364	AIR-CONDITION PLANT	5	100.0%	0.0%		
365	VEHICLE REPAIR EQUIP.	5	100.0%	0.0%		
366	PORTABLE SLEEPING UNITS	10	33.3%	0.0%		
367	CARPETS	5	100.0%	0.0%		
368	POWER TOOLS (HAND)	5	100.0%	0.0%		
369						
370	CAPITALIZED OP. EXPENSES	5	20.0%	0.0%		
371						
372	EXPLORATION EXPENDITURE	5.00	20.0%	0.0%		
373	MINERAL CLAIMS COSTS (10% OF EXPLOR.)	20.00	5.0%	0.0%		
374						
375						
376	SOURCES OF DATA:	Price Waterhouse (PW, 1994a)				
377		IWGMI (1993a)				
378		IMF (1995)				
379						
380						

Cell: I11

Note: GENERAL BUSINESS PROCEDURES (PW: 27-30, 32, 54, 97) ; (IWOMI: 5):

Foreign investment is regulated by Decree Law No. 600 and is administered by the Foreign Investment Committee, which draws up the terms and conditions of the respective contract. Generally the laws are very investor friendly.

The Central Bank is responsible for foreign exchange transactions. There are no restrictions on remittances of profits but capital must remain in the country for one year.

Foreign investors usually make use of one of three business entities: the close corporation (not stock exchange listed), a Branch or limited liability partnership. There are no tax advantages between the entities but the limited liability entity is the simplest to constitute. 100 per cent foreign ownership is allowed and there is no obligation for employee participation in management.

Cell: J11

Note: INVESTMENT IN MINING:

The Foreign Investment Committee signs a separate agreement with each foreign investor. The time is stipulated in which the investment must be made and is usually three years. For mining projects the period is 8 years and can be extended to 12 years to cater for exploration.

Cell: J56

Note: VAT TREATMENT (PW: 117-119):

Exports are not subject to VAT which precludes the use of an input offset. Exporters can reclaim VAT expenses through various methods and timing. In general, VAT is levied at a rate of 18 per cent on goods and services. VAT is also levied on imports and is assessed on the CIF value plus any duties. Imports under Decree Law No. 600 (see above) are exempt.

Cell: J58

Note: SOCIAL SECURITY CHARGES (PW: 61-62):

Ranges from 0.9% to 3.4% of remuneration for the employer's account, depending on job description and degree of risk. Assumed an average 2.0% for purposes of this analysis. Employees contribute 10 per cent of taxable salary to a maximum of 60 monthly development units (Ch\$10 900 per unit as of May 1994).

Cell: K58

Note: OTHER SOCIAL SECURITY CHARGES:

Percentage of turnover for employee development. N/A to Chile.

Cell: J59

Note: TRAINING LEVY (PW: 97):

Up to 1% of annual payroll for approved training plans. Allowable as a credit against First Category Tax (see comments below on taxation computations).

Cell: J61

Note: CUSTOMS DUTIES (PW: 33-34):

11 per cent imposed on most products at CIF based prices without deduction of special discounts.

Cell: J64

Note: LAND/BUILDING TAXES:

Any property taxes are allowed as a credit against the First Category Tax.

Cell: J66

Note: STAMP DUTIES (PW: 120):

Rate varies between 0.1 and 1.2% on value of transactions. Prima facie documents are subject to 0.5% of their value. Assume average value for this analysis as difficult to be specific on the transactions that are possible. Banking transactions attract a rate of 75 pesos per transfer or withdrawal.

Cell: J67

Note: REAL ESTATE TAX (PW: 97, 120):

2.0 per cent tax rate on cadastral value, this being revised every 5-10 years. Revised also January and July on the basis of the CPI. Allowable as a credit against First Category Tax (see tax notes below).

Cell: J69

Note: MINING CONCESSION FEES:

Legal fees ranging from US\$ 0.19 per hectare for 300 hectares and US\$1.5/ha for a claim over 3000 ha in respect of exploration. For exploitation US\$0.38/ha for a 100 ha claim and US\$1.87/ha for claims over 600 ha. See project module for claim size.

Cell: K69
 Note: LICENCE FEES:

License fees of US\$0.83/ha for exploration, US\$4.18/ha for exploitation and US\$1.38/ha for non-metallic and alluvial mines.

Cell: J70
 Note: EXCISE TAX: ON AUTO FUEL (PW: 121, 131):

Tax on importation or first sale of auto fuel, amounting to 3.4 monthly tax units per cubic metre (see note on tax unit below). Some credit allowed for mining companies when transporting minerals from mines to industrial plants. Assume nil for this gold mine example.

Cell: J71
 Note: EXCISE TAX: ON DIESEL FUEL (PW: 121):

Tax on importation or first sale of diesel fuel, amounting to 2.0 monthly tax units per cubic metre (see note on tax unit below). Some credit allowed for mining companies when transporting minerals from mines to industrial plants. Assume nil for this gold mine example.

Cell: J77
 Note: NON-GOVERNMENT ROYALTIES:

To be scrutinised by the government. Royalties of this nature are tax deductible.

Cell: J93
 Note: REGIONAL TAXES: N/A to Chile.

Cell: J98
 Note: MANDATORY PROFIT SHARE (PW: 58):

In the absence of a formal employer/employee agreement the following is enacted by law:

30% of net profits (taxable income essentially) less 10% of net equity,

OR:

pay bonus equal to 25% of annual income up to a maximum of 4.75 times the monthly minimum wage (about Ch.\$ 247 000 = US\$ 525 in 1994) in force at end of period.

The amount paid to employees in terms of the requirement is tax deductible.

Cell: J108
 Note: WITH-HOLDING TAX ON DIVIDENDS (PW: 86, 128):

Dividends remitted abroad are subject to the 35% Additional Tax but First Category Tax is credited. NOTE: Effective rate in this case is zero because tax already levied on taxable income at 35%.

Cell: J111
 Note: WITH-HOLDING TAX ON ROYALTIES:

Royalties subject to the 35% Additional Tax but First Category tax deducted. Royalties are deductible expenses provided they are necessary to produce income. Must be approved by Central Bank if remitted to other countries.

Cell: J114
 Note: WITH-HOLDING TAX ON INTEREST:

Interest paid on loans is subject to the 35% Additional Tax but First Category tax deducted. When paid to foreign banks the rate is set at 4 (four) per cent.

Cell: J116
 Note: WITH-HOLDING TAX ON MAN. FEES:

Fees subject to the 35% Additional Tax but First Category tax deducted. For engineering or technical services this rate is 20%.

Cell: J171
 Note: FOREIGN LOANS (PW: 30, 34):

30 per cent of the principal has to be deposited in a non-interest bearing account for one year. This requirement can be replaced by the acquisition and simultaneous repurchase of Central Bank 'paper'; whereby the Central Bank deducts from the repurchase the LIBOR rate plus 4 per cent.

Cell: J223
 Note: GENERAL TAX ISSUES:

There do not appear to be any major advantages to foreign corporations in operating as a subsidiary corporation or branch office. There are no specific requirements for foreign investors to participate with local partners. Generally the procedures for constituting an entity in Chile are inexpensive and the time required is relatively short.

Cell: J224

Note: COMPUTATION OF TAXABLE INCOME (PW: 93-98, 125); (TWGMI: 9):

Taxable income is gross income less:
direct costs, business expenses, depreciation, exploration and development, research and development, net exchange losses, net interest expenses. Taxes other than income tax are deductible.

First Category Tax applied to accrued taxable income for all mining enterprises.

Secondary or Additional Tax applied when profits/dividends are remitted abroad. A credit of the First Tax is allowed against the Additional Tax, e.g.

Taxable income	100
First Cat. Tax	15
Avail. for remittance	85
 Taxable income	 100
Additional Tax	35
Less 15% tax	15
Net additional tax due	20
 Total taxation	 35 (or 35%)

Cell: J226

Note: TAX UNIT VALUE (PW: 132):

Various fiscal charges are calculated in terms of a certain number of tax units. The value of the tax unit is adjusted on the basis of the CPI. For purposes of standardisation the unit is given here in US dollars, but as of May 1994, a YEARLY tax unit was worth Ch\$229 524 = US\$537,5 (Ch\$427 = US\$1). Monthly tax unit = US\$44,8.

Cell: J238

Note: TAXATION RATES (PW: 89, 125):

Consists of a First Category Tax of 15% on all mining enterprises. An Additional Tax of 35% is applied to distributed earnings to foreign investors. In this instance, the FCT can be credited against the Additional Tax levied.

Cell: J323

Note: INVESTMENT RECOVERY PERIOD: N/A to Chile.

Cell: J324

Note: TARGET INCOME RATE: N/A to Chile.

Cell: J327

Note: ADDITIONAL PROFITS TAX: N/A to Chile.

Cell: J333

Note: LOSSES CARRIED OVER FOR TAX (PW: 96):

The period allowed for carry forward of tax losses to be offset against future income. Tax losses may be carried forward indefinitely. Losses may not be carried backwards.

NOTE: Period allowed for in the simulation formula is 1-8 years. If more than this then assumed as 20 years or indefinite.

Cell: J339

Note: DEPLETION ALLOWANCE (GOLD AND SILVER): Not applicable to Chile.

Cell: J340

Note: DEPLETION ALLOWANCE (OTHER MINERALS): Not applicable to Chile.

Cell: E348

Note: DEPRECIATION (PW: 93, 126):

Depreciation determined by straight line method, except for land. Annual depreciation applied after revaluation of fixed assets according to rules on inflation adjustment. Accelerated depreciation can be applied to assets with useful lives over 5 years.

Cell: J373

Note: MINERAL CLAIM COSTS (TWGMI: 11):

Deducted as a direct cost, calculated as a proportion of annual ore extracted versus the reserves technically contained in the respective claims. Assumed equal instalments over the life of the operation.

	F	G	H	I	J	K
1	COUNTRY CRITERIA	NB: Blocked or shaded cells indicate conditions are attached. Refer to notes as per respective cell addresses.				
2	SIMULATION MODEL					
3						
4	COUNTRY CRITERIA MODULE					
5						
6	CRITERIA HEADINGS	INDONESIA				
11	ECONOMIC INPUT	NOTES				
14						
15	COUNTRY INFLATION RATE	5.0%				
20						
21	EXCHANGE RATE (PER US\$)	2.25 RUPIAH x 1000				
43		PER US\$				
44	COUNTRY SPECIFIC FACTORS					
45						
46	PROD. ROYALTY ON COPPER	MIN. 1.5% MAX. 3.5%				
47	PRICE RANGE	FORMULA \$0.50 \$1.10				
48	PROD. ROYALTY ON GOLD	FORMULA 1.5% 2.5%				
49	PRICE RANGE	\$300 \$400				
50	EXPORT ROYALTY	0.4%				
51	TAX ON ALLUVIAL GOLD	0.0% 0.0%				
52						
56	SALES TAXES / VAT	VAT 0.0% ZERO RATED				
58	SOCIAL SECURITY CHARGES	0.0% 0.0%				
59	TRAINING EXPENSES	0.0%				
61	CUSTOMS DUTIES	0.0%				
64	LAND/BUILDING TAXES	0.1%				
65	DEAD RENT	\$0.5 \$3.0				
66	STAMP DUTIES	0.0%				
67	REAL ESTATE TAX	0.0%				
68	CAPITAL TAX	0.0%				
69	MINING CONCESSION FEES	0.00% 0.01%				
70	EXCISE TAX: AUTO FUEL	0.0%				
71	EXCISE TAX: DIESEL	0.0%				
72						
77	ROYALTIES (NON-GOVN.)	0.0%				
80						
81	CORPORATE TAX REGIME					
82						
86	COMPANY TAXATION	SEE TAX NOTE BELOW				
90	TAX CREDITS					
92	ADDITIONAL PROFITS TAX	SEE APT NOTES BELOW				
93	PROVINCIAL/LOCAL TAXES	0.0%				
97	INTEREST CHARGE BY LOCAL BANK	0.0%				
98	EMPLOYEES' SHARE OF PROFITS	0.0%				
99	PERCENTAGE OF INCOME	0.0%				
100	MAXIMUM BONUS AMOUNT	0 \$0.0				
105						
106	WITHHOLDING TAXES ON:					
107						
108	DIVIDENDS: SUBSIDIARY	0.0%				
109	DIVIDENDS: BRANCH	0.0%				
110						
111	ROYALTIES: NON-ASSOC.	0.0%				
112	ROYALTIES: ASSOCIATE	0.0%				
113						
114	LOAN INTEREST	0.0%				
115						
116	MANAGEMENT FEES	0.0%				
117	(to non-residents)					
118	ROYALTIES TO LANDOWNERS	0.0%				
169						
170	DEBT AND LOAN FINANCE SCHEDULE					
171		NOTES				
172		NOTES				
173						
222						
223	TAXATION CALCULATION SCHEDULE					
224		NOTES				
225						

	F	G	H	I	J	K
1	COUNTRY CRITERIA	NB: Blocked or shaded cells indicate conditions are attached. Refer to notes as per respective cell addresses.				
2	SIMULATION MODEL					
3						
4	COUNTRY CRITERIA MODULE					
5						
6	CRITERIA HEADINGS	INDONESIA				
226	MONTHLY TAX UNIT					
236		INV. REC.	NORMAL		OTHER	
237	TAXATION RATES:	PERIOD	STATUS		FACTORS	
238	SUBSIDIARY	35.0%	35.0%		0	
239	BRANCH	35.0%	35.0%			
240	SURCHARGES				0.0	
241	ALLOWANCE ON CAPEX: TAX %				0.0	
319						
320	CONDITIONAL TAX CALCULATIONS					
321						
323	INVESTMENT RECOVERY PERIOD	NOTES				
324	TARGET INCOME	10.0%				
326						
327	ADDITIONAL PROFITS TAX (AFT)	7.0%				
328	NET CASHFLOW (EXCLUDING INTEREST & DEPREC.)					
329	NPV AT 10% PRIME + STIPULATED % P.A.	12.0%				
330						
333	ANNUAL LOSS COUNTER	0.0				YEARS
338	DEPLETION ALLOWANCES:					
339	GOLD & SILVER SALES	0.0%				
340	OTHER METALS/MINERALS	0.0%				
341						
342						
343						
344	CAPITAL EXPENDITURE SCHEDULE					
345						
346		ASSET CATEGORY	STRAIGHT LINE	DECLINING BALANCE		
347		GROUP	1.00	1.00		
348		NOTES	SLAG: Y = 1.00			
349	MINE & MACHINERY/PLANT	2	0.0%	25.0%		
350	MINE/REFINING PLANT	2	0.0%	25.0%		
351	BUILDINGS, MINESITE PREP.	4	5.0%	0.0%		
352	SHIPS/STEAMERS	2	0.0%	25.0%		
353	EARTHMOVING EQUIP.	2	0.0%	25.0%		
354	BUILDINGS/STEEL	4	5.0%	0.0%		
355	BUILDINGS/WOOD, PRE-FAB.	2	0.0%	25.0%		
356	MAG. SURVEY EQUIP.	4	5.0%	0.0%		
357	COMPUTERS	1	0.0%	50.0%		
358	FURNITURE/FITTINGS	1	0.0%	50.0%		
359	OTHER OFFICE EQUIP.	1	0.0%	50.0%		
360	RADAR VEHICLES	1	0.0%	50.0%		
361	CONCRETE MIXERS	2	0.0%	25.0%		
362	IMMERSION VIBRATORS	2	0.0%	25.0%		
363	CRANES	2	0.0%	25.0%		
364	AIR-CONDITION PLANT	2	0.0%	25.0%		
365	VEHICLE REPAIR EQUIP.	2	0.0%	25.0%		
366	PORTABLE SLEEPING UNITS	2	0.0%	25.0%		
367	CARPETS	1	0.0%	50.0%		
368	POWER TOOLS (HAND)	2	0.0%	50.0%		
369						
370	CAPITALIZED OP. EXPENSES		0.0%	25.0%		
371						
372	EXPLORATION EXPENDITURE		0.0%	25.0%		
373	MINERAL CLAIMS COSTS (10% OF EXPLOR.)		20.0%	0.0%		
374						
375						
376	SOURCES OF DATA:	Price Waterhouse (PW, 1993)				
377		IWGMI (1993b)				
378		World Bank (1992)				
379		IMF (1995)				
380						

Cell: J11

Note: GENERAL BUSINESS PROCEDURES (PW: 33, 49, 50, 59, 87-90):

Foreign and domestic investment is coordinated by the Badan Koordinasi Penanaman Modal (BKPM). Procedures are generally well administered.

There is rarely any choice in the form of business structure. It must be a limited liability company incorporated in Indonesia, i.e. the Penanaman Modal Asing (PMA). The government requires foreign investment to be undertaken with Indonesian interests.

Usually 20 per cent local ownership initially, increasing to 51 per cent in 20 years. 100 per cent foreign ownership is allowed if the investment is at least US\$ 50 million and is located in a remote area. This must be reduced to 95 per cent within 5 years after initial production and to 80 per cent ownership within 20 years.

There is no restriction on the movement of capital and profits. It is usually more efficient to repatriate profits via royalties, interest and management fees than by way of dividends.

There is no shortage of unskilled, low cost labour but skilled staff are not as readily available. There can be problems with importing expatriate skills.

Only Indonesians have the right to own land but foreigners can be given the right to 'build' and to 'exploit'.

Cell: J11

Note: MINING PROCEDURES (PW: 101-102, 151-152) ; (IWGMI: 5) ; (World Bank: 69):

This must be negotiated through the Ministry of Mines and Energy which is entitled to grant the relevant agreements, including the Contract of Work (CoW). The CoW is submitted to the BKPM and contains all the terms attached to the investment, development and production phases. Mining is regulated by authorizations known as kuasa pertambangan (KP) which can only be held by Indonesians.

Ownership of minerals in the ground vests in the State and the right to extraction by foreign investors is effected through the CoW. The CoW provides for various phases of development, e.g.:

General prospecting, 1 year; exploration, 3 years; evaluation, 1 year; construction, 3 years; operating period, - 30 years.

A production royalty is paid by the company to the government in respect of ownership consideration. The amount is approximately 2 per cent of the sales value (see formulae below).

Cell: J46

Note: PRODUCTION ROYALTY FOR COPPER (IWGMI: 20):

Calculated using a formula:

$$R = 1.50 + (ACP - 90/20), \text{ where;}$$

ACP = Applicable copper price

If price US\$ 0.90 /lb or less then 1.5% of the sales price. If price exceeds \$1.10/lb then 3.5% of the sales price.

Cell: J46

Note: LOWER LIMIT ROYALTY RATE FOR COPPER:

% rate on copper price less than or equal to lower limit (shown in US\$ /lb).

NOTE: If a normal revenue based royalty, enter % rate here. Set minimum and maximum price to NIL.

Cell: K46

Note: UPPER LIMIT ROYALTY RATE FOR COPPER:

% rate on copper price higher than or equal to upper limit (shown in US\$ /lb).

Cell: J48

Note: PRODUCTION ROYALTY FOR GOLD (IWGMI: 20):

Calculated using a formula:

$$R = 1.00 + (AGP - 300/100) \text{ as a \%}$$

where;

AGP = Applicable gold price.

If price \$300/oz or less then 1.0%. If price exceeds \$400/oz then 2.0% of the sales price.

Cell: J48

Note: LOWER LIMIT ROYALTY RATE FOR GOLD:

% rate on gold price less than or equal to lower limit (shown in US\$ /oz).

NOTE: If normal revenue based royalty, enter % rate here. Set minimum and maximum price at nil.

Cell: K48

Note: UPPER LIMIT ROYALTY RATE * GOLD:

% rate on gold price higher than or equal to upper limit (shown in US\$ /oz).

Cell: J30

Note: EXPORT ROYALTIES:

Does not appear to be any export-type royalty but the production royalty is payable, as described above.

Cell: J36

Note: VAT TREATMENT (PW: 179-186):

Mining companies are required to register for VAT. Exported products are zero rated and all VAT paid on inputs is reclaimed.

Mining companies exempt for pre-production period and first ten years of production (to be confirmed).

Cell: J38

Note: SOCIAL SECURITY (PW: 109):

Worker's Social Insurance Programme, ASTER, provides accident/retirement benefits scheme and covers minimum benefits. The conditions are as follows:

Accident insurance: Paid by employer and varies from 0.24 - 3.6% of basic salary.

Retirement: 2.5% of the employee's basic salary; comprising 1.5% by employer and 1.0% by employee.

Death insurance: Paid by employer at a rate of 0.5% of basic salary.

All are deductible for tax in the hands of the employer but pension is not a taxable benefit for the employee.

NOTE: For purposes of this exercise assume: $2.0\% + 1.5\% + 0.5\% = 4.0\%$ to the account of the employer.

Cell: K58

Note: PAYROLL TAXES:

Percentage of turnover for employee development. N/A to Indonesia.

Cell: J61

Note: IMPORT DUTIES (PW: 81-82):

Varies between 0 - 100% with luxury items attracting up to 20% duties. Exceptions are:

PRIMARY EQUIPMENT: 100% exempt.

SUPPORT EQUIPMENT: 50% exempt.

SPARES: 100% exempt for main equipment, up to a value of 5% of the main equipment's value.

RAW MATERIALS: 100% exempt for the first two years of production for goods not available locally. If the duty is 5% or higher, the exemption is 50%.

CONSUMABLES: 100% exemption if related to main equipment for first year of operation.

ASSUME 100% EXEMPT FOR PURPOSES OF THIS EXERCISE.

Cell: J64

Note: LAND/BUILDING TAXES (PW: 128):

There are many provisions depending on the category of the asset. These can also differ according to the COW generation. In general the tax rate is 0.1% per annum on the value of the land and buildings.

Cell: J65

Note: DEAD RENT:

Dead rent in US \$ per hectare for the CONSTRUCTION period.

Cell: K65

Note: DEAD RENT:

Dead rent in US \$ per hectare for the OPERATING period. There are different rates for other stages of activity, such as

the general survey period, exploration period and feasibility study period.

Cell: J66

Note: STAMP DUTIES (PW: 187, 217):

Items include receipts, cheques, agreements and powers of attorney.

Stamp tax amounts to Rp 1000 (US\$0.55) for most documents. Cheques attract a tax of Rp 500 regardless of value.

Assumed negligible for purposes of this exercise. Difficult to simulate the various transactions attached to the project.

Cell: J68

Note: CAPITAL TAX (A): No information available.

Cell: K68

Note: CAPITAL TAX (B) (PW: 92):

Tax rate payable on formation of company. Varies from 0.01 to 0.05% of the invested capital. Assumed 0.03% for purposes of the exercise.

Cell: J69

Note: LEGAL FEES: No information available, but would market related as per lawyer rates.

Cell: K69

Note: LICENCE FEES: No information available.

Cell: J70

Note: EXCISE TAX ON AUTO FUEL: No information available.

Cell: J71

Note: EXCISE TAX ON DIESEL FUEL: No information available.

Cell: J77

Note: NON-GOVERNMENT ROYALTIES (PW: 143-144):

To be scrutinised by the government. Royalties of this nature are tax deductible. Intercompany charges are treated similarly.

Cell: J93

Note: REGIONAL TAXES (PW: 188):

Minor taxes are levied by regional governments. No information was available on rates and conditions.

Cell: J98

Note: MANDATORY PROFIT SHARE: N/A to Indonesia.

Cell: J108

Note: WITH-HOLDING TAXES ON DIVIDENDS (PW: 133, 204):

15 per cent for residents and 20 per cent for non-residents, but may be reduced if tax treaty in force. Assume no tax treaty for purposes of this analysis.

It is normal, better to extract profits via royalties, interest and management fees.

Cell: J109

Note: WITH-HOLDING TAXES (BRANCHES):

20 per cent irrespective of whether remitted overseas or not.

Cell: J111

Note: WITH-HOLDING TAX ON ROYALTIES:

20% to non-resident companies which may be different if tax treaty in force. 15% if the recipient is a resident.

Cell: J114

Note: WITH-HOLDING TAX ON INTEREST:

20% to non-resident companies which may be different if tax treaty in force. 15% is levied if recipient is a resident. There are no specific limitations regarding debt-equity ratio.

Cell: J116

Note: WITH-HOLDING TAX ON MAN. FEES:

20% to non-resident companies which may be different if tax treaty in force. 15% is levied if recipient is a resident.

Cell: J171

Note: LOAN RESTRICTIONS (PW: 38, 143):

There appears to be no restriction on the debt-equity relationship. The Minister of Finance does have some discretion on this issue, however. Some COW have stipulated limits in respect of hard-rock mining.

Cell: J172

Note: LOAN INTEREST FOR TAX PURPOSES (PW: 143):

Generally deductible for tax purposes provided principal amount borrowed for purposes of earning taxable income.

Some discretion is required on excessive interest being paid on debt finance and to related parties.

Cell: J224

Note: COMPUTATION OF TAXABLE INCOME (PW: 142-145):

All income less the costs of securing that income, e.g.:

Wages/salaries, honoraria, interest, rent, royalties, travel costs, bad debts, insurance premiums, administration costs and taxes other than income tax.

Cell: J226

Note: TAX UNIT VALUE: N/A to Indonesia.

Cell: J237

Note: INVESTMENT RECOVERY PERIOD: N/A to Indonesia.

Cell: J238

Note: CORPORATE TAX RATES (PW: 138):

Profits of corporations are taxed at the top rate of 35%.

Cell: J239

Note: BRANCH TAX RATE (PW: 159):

Branches of foreign corporations are taxed at normal rates on income attributable to Indonesian operations.

A further 20% is payable on after-tax income irrespective if a dividend is declared and retained in Indonesia. Branch operations are only allowed for certain service type businesses.

Cell: J323

Note: INVESTMENT RECOVERY PERIOD: N/A to Indonesia.

Cell: J324

Note: TARGET INCOME RATE: N/A to Indonesia.

Cell: J327

Note: ADDITIONAL PROFITS TAX: N/A to Indonesia.

Cell: J333

Note: LOSSES CARRIED FORWARD FOR TAX (PW: 146):

The period allowed for tax losses to be carried forward to be offset against future income. Losses may not be carried backwards.

Period allowed for in the simulation formula is 1-8 years. If more than this then assumed 20 years or indefinite.

Cell: J339

Note: DEPLETION ALLOWANCE (GOLD AND SILVER): Not applicable to Indonesia.

Cell: J340

Note: DEPLETION ALLOWANCE OTHER MINERALS): Not applicable to Indonesia.

Cell: J348

Note: DEPRECIATION FOR TAX PURPOSES (PW: 142, 200):

Assets to be depreciated from time of purchase, or time of first use (approval by tax authorities). Depreciation in the pre-production period would be classified as deferred expenses.

Assets are classified per four categories (see below in capex schedule) and are depreciated using the Declining Balance method at the prescribed rates. Building and infrastructure related assets are depreciated using the Straight Line method. The cost of land is not allowable as a depreciable write-off.

Pre-production and production costs cannot be transferred from one COW area to another, i.e. the ring-fencing principle applies.

Cell: K370

Note: PRE-PRODUCTION EXPENSES (IWGMI: 14):

Pre-production costs are depreciable from first production at rates agreed upon in the CoW. Assume declining balance method at 25% per annum.

Cell: K372

Note: EXPLORATION/DEVELOPMENT EXPENSES (IWGMI: 14):

The CoW specifies the following to be amortized at 25% per annum using the DB method:

Patents, franchises, concessions, licenses, leasehold interest and pre-production expenses. Effective from the date of commercial production and are deferred expenses until then.

Cell: J373

Note: MINERAL RIGHTS CLAIMS (PW: 143):

Costs of acquiring mineral rights can be amortized by the unit of production method up to a maximum of 20% per annum.

	F	G	H	I	J	K
1	COUNTRY CRITERIA	NB: Blocked or shaded cells indicate conditions are attached. Refer to notes as per respective cell addresses.				
2	SIMULATION MODEL					
3						
4	COUNTRY CRITERIA MODULE					
5						
6	CRITERIA HEADINGS	PAPUA NEW GUINEA				
11	ECONOMIC INPUTS	NOTES				
14						
15	COUNTRY INFLATION RATE	5.0%				
20						
21	EXCHANGE RATE (PER US\$)	1.25 KINA PER US\$				
43						
44	COUNTRY SPECIFIC FACTORS					
45						
46	PROD. ROYALTY ON COPPER	MIN. 1.0% MAX. 0.0%				
47	PRICE RANGE	\$0.00 \$0.00				
48	PROD. ROYALTY ON GOLD	MIN. 1.0% MAX. 0.0%				
49	PRICE RANGE	\$0 \$0				
50	EXPORT ROYALTY	0.0%				
51	TAX ON ALLUVIAL GOLD	5.0% 10.0%				
52						
56	SALES TAXES / VAT	SALES TAX 3.0%				
58	SOCIAL SECURITY CHARGES	7.0% 0.0%				
59	TRAINING EXPENSES	3.0%				
61	CUSTOMS DUTIES	10.0%				
64	LAND/BUILDING TAXES	0.0%				
65	DEAD RENT	\$0.00 \$0.00				
66	STAMP DUTIES	0.0%				
67	REAL ESTATE TAX	0.0%				
68	CAPITAL TAX	0.0%				
69	MINING CONCESSION FEES	0.0%				
70	EXCISE TAX: AUTO FUEL	0.0%				
71	EXCISE TAX: DIESEL	0.0%				
72						
77	ROYALTIES (NON-GOVN.)	2.5%				
80						
81	CORPORATION TAX REGIME					
82						
86	COMPANY TAXATION	SEE TAX NOTE BELOW				
90	TAX CREDIT					
92	ADDITIONAL TAX	SEE APT NOTES BELOW				
93	PROVINCIAL TAXES	0.0%				
97	INTEREST CHARGE BY LOCAL BANK	0.0%				
98	EMPLOYERS' SHARE OF PROFITS	0.0%				
99	PERCENTAGE OF INCOME	0.0%				
100	MAXIMUM BONUS AMOUNT	0 50.0				
105						
106	WITH-HOLDING TAXES ON					
107						
108	DIVIDENDS: SUBSIDIARY	17.0%				
109	DIVIDENDS: BRANCH	0.0%				
110						
111	ROYALTIES: NON-ASSOC.	10.0%				
112	ROYALTIES: ASSOCIATE	30.0%				
113						
114	LOAN INTEREST	0.0%				
115						
116	MANAGEMENT FEES	15.0%				
117	(to non-residents)					
118	ROYALTIES TO LANDOWNERS	2.0%				
169						
170	EQUITY AND LOAN FINANCE SCHEDULE					
171		NOTES				
172		NOTES				
173						
223						
223	TAXATION CALCULATION SCHEDULE	NOTES				
224		NOTES				
225						

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351	BUILDINGS, MINESITE PREM.	2.0%	10.0%	15.0%																																																																																																																																																																																
352	SHIPS/STRAKERS	7.5%	10.0%	15.0%																																																																																																																																																																																
353	HARVESTING EQUIP.	20.0%	10.0%	15.0%																																																																																																																																																																																
354	BUILDINGS/STEEL	4.0%	10.0%	15.0%																																																																																																																																																																																
355	BUILDINGS: WOOD, PRE-FAB.	10.0%	10.0%	15.0%																																																																																																																																																																																
356	MAG. SURVEY EQUIP.	3.0%	10.0%	15.0%																																																																																																																																																																																
357	COMPUTERS	15.0%	10.0%	15.0%																																																																																																																																																																																
358	FURNITURE/FITTINGS	7.5%	10.0%	15.0%																																																																																																																																																																																
359	OTHER OFFICE EQUIP.	10.0%	10.0%	15.0%																																																																																																																																																																																
360	MOTOR VEHICLES	20.0%	10.0%	15.0%																																																																																																																																																																																
361	CONCRETE MIXERS	15.0%	10.0%	15.0%																																																																																																																																																																																
362	IMMERSON VIBRATORS	25.0%	10.0%	15.0%																																																																																																																																																																																
363	CRANES	10.0%	10.0%	15.0%																																																																																																																																																																																
364	AIR-CONDITION PLANT	10.0%	10.0%	15.0%																																																																																																																																																																																
365	VEHICLE REPAIR EQUIP.	10.0%	10.0%	15.0%																																																																																																																																																																																
366	PORTABLE SLEEPING UNITS	20.0%	10.0%	15.0%																																																																																																																																																																																
367	CARPETS	20.0%	10.0%	15.0%																																																																																																																																																																																
368	POWER TOOLS (HAND)	10.0%	10.0%	15.0%																																																																																																																																																																																
369																																																																																																																																																																																				
370	CAPITALIZED OP. EXPENSES	10.0%	10.0%	0.0%																																																																																																																																																																																
371																																																																																																																																																																																				
372	EXPLORATION EXPENDITURE	1.00	20.0%	0.0%																																																																																																																																																																																
373	MINERAL CLAIMS COSTS (10% OF EXPLOR.)	20.00	5.0%	0.0%																																																																																																																																																																																
374																																																																																																																																																																																				
375																																																																																																																																																																																				
376	SOURCES OF DATA:	Price Waterhouse (PW, 1990a)																																																																																																																																																																																		
377		Coopers and Lybrand (1991)																																																																																																																																																																																		
378		IWGMI (1993c)																																																																																																																																																																																		
379		Kumar (1991)																																																																																																																																																																																		
380		IME (1995)																																																																																																																																																																																		

Cell: I11

Notes: GENERAL BUSINESS PROCEDURES (PW: 31, 39, 47-50, 25-29):

Investment and setting up a business in PNG is controlled through the National Investment and Development Authority (NIDA), although exceptions do pertain to mining and petroleum exploration companies and certain support services.

There is a choice in the form of business entity for foreign investment. Branches are taxed at a higher rate than local subsidiaries but the cost of setting up the latter is higher. To simplify the process investors can make use of 'shelf' companies which can be bought from legal or accounting practice firms.

Although there are no restrictions to the level of foreign shareholding, the government prefers a degree of local participation (see mining procedures). Companies are expected to train local staff to managerial positions as soon as is practicable.

There are no restrictions to the repatriation of capital and profits. All liabilities and tax payments must be settled, however, before repatriation. The Bank of PNG is the exchange control authority and oversees conditions underlying most transfers of funds from PNG.

Cell: J11

Notes: MINING PROCEDURES (PW: 105-108):

Development of a large scale mining project is effected through a Special Mining Lease (SML).

A prospecting authority is granted to an explorer over an area not exceeding 25 000 square kilometres. It is usually valid for 2 years and grants the holder the exclusive right to prospect for specified minerals in that area.

On discovering a mineral deposit the prospector applies for the SML which covers an area not exceeding 60 square kilometres. An agreement is drawn up with the government before the SML is granted and this would include the government's option to acquire equity in the project between 10 - 30 per cent.

Before the SML is granted a Proposal for Development must be verified by the authorities which forms the basis of the Mineral Development Contract between the State and the Investors (IWGMI: 5).

Cell: J46

Notes: LOWER LIMIT ROYALTY RATE FOR COPPER:

% rate on copper price less than or equal to lower limit (shown in US\$ /lb).

NOTE: If a normal revenue based royalty, enter % rate here. Set minimum and maximum price to NIL.

Latter applicable to PNG.

Cell: K46

Notes: UPPER LIMIT ROYALTY RATE FOR COPPER: N/A to PNG.

Cell: J48

Notes: LOWER LIMIT ROYALTY RATE FOR GOLD (Coopers and Lybrand: 75) ; (IWGMI: 21):

% rate on gold price less than or equal to lower limit (shown in US\$ /oz).

NOTE: If normal revenue based royalty, enter % rate here. Set minimum and maximum price at nil.

Latter applicable to PNG.

Cell: K48

Notes: UPPER LIMIT ROYALTY RATE FOR GOLD: N/A to PNG.

Cell: J50

Notes: EXPORT ROYALTIES: N/A to PNG but production royalties are payable as displayed above.

Cell: J51

Notes: ALLUVIAL GOLD TAXES (Coopers and Lybrand: 75) ; (IWGMI: 22):

The rate payable at point of export on processed or unprocessed alluvial gold, metallic ores and concentrates and roasted iron pyrites.

Cell: K51

Notes: PROPORTION ALLUVIAL GOLD:

The percentage of gold produced from alluvial sources, for purposes of the simulation.

Cell: J56

Notes: SALES TAXES (PW: 146) ; (IWGMI: 21):

The right to impose taxes on sales is vested in the provincial governments and varies between 1 and 4 per cent.

Assume 3% for purposes of this exercise.

Cell: J58

Note: SOCIAL SECURITY PAYMENTS (PW: 63) ; (TWGMI: 24):

An employer of 25 or more personnel has to register with the National Provident Fund. Membership is compulsory for personnel working more than 59 days in a three month period. The following rates apply to gross salary:

Employees: 5 per cent minimum, with voluntary contributions up to a maximum of 10 per cent.

Employers: 7 per cent which is non-refundable, but is tax deductible.

Cell: J59

Note: TRAINING LEVY (PW: 61) ; (TWGMI: 25):

Applied at a rate of 2 per cent of taxable salary, including benefits. The amount is reduced by the expenses actually incurred on training of PNG citizens. Companies are required to submit proposals setting out reasons for employing expatriate staff and plans for training local personnel. Costs were not stipulated. K500 must be paid for approval of every ex-patriate position held.

Cell: J61

Note: IMPORT DUTIES (PW: 145, 174):

Customs duties are levied by the federal government on most imported products at the CIF value. The range varies as follows:

Clothing	30 %
Motor vehicles	25 to 75 %
Hand tools	9 %
Typewriters, calculators and computers	9 %
Drilling rigs	9 %

There may be certain reductions for investment and development purposes.

Assumed an average of 10 per cent for purposes of this exercise.

Cell: J64

Note: LAND TAXES (PW: 76, 147):

The annual rate applied by provincial and local governments on the unimproved capital value of the property. The value is determined by the PNG Valuer General. Reportedly these taxes are relatively nominal. Set at zero for purposes of this exercise.

Cell: J65

Note: DEAD RENT CONSTRUCTION PERIOD: N/A to PNG.

Cell: K63

Note: DEAD RENT FOR OPERATING PERIOD: N/A to PNG.

Cell: J66

Note: STAMP DUTIES (PW: 146) ; (TWGMI: 22-23):

A range of stamp duties payable on various transactions; cheques, loan agreements, leases, transfers of marketable securities and ownership. Appear to be small in relative terms. Difficult to simulate for this exercise so not accounted for.

Cell: J68

Note: CAPITAL TAX (A): No information available.

Cell: K68

Note: CAPITAL TAX (B) (PW: 51):

The fee for registration of a company is K10 000 for capitalisation over K 1 million.

Cell: J69

Note: LEGAL FEES: Information not available.

Cell: K69

Note: LICENCE FEES: Information not available.

Cell: J70

Note: EXCISE TAX ON AUTO FUEL: Information not available.

Cell: J71

Note: EXCISE TAX ON DIESEL FUEL: Information not available.

Cell: J77

Note: NON-GOVERNMENT ROYALTIES (PW: 94, 98, 119) ; (IWGMI: 20):

To be scrutinized by the government. Royalties of this nature are tax deductible.

Cell: J98

Note: MANDATORY PROFIT SHARE: N/A to PNG.

Cell: J108

Note: WITH-HOLDING TAXES ON DIVIDENDS (PW: 83, 119, 149) ; (IWGMI: 20):

The with-holding tax on dividends is set at 17% irrespective of whether the recipient is a resident or non-resident.

Cell: J111

Note: WITH-HOLDING TAXES ON ROYALTIES (PW: 83, 119, 149) ; (IWGMI: 20):

Where the recipient is not an associated entity a 10% tax is levied. If an associate entity then a 30% tax is with-held. An associated entity includes relatives, partners, companies under effective control and related trust interests.

Cell: J114

Note: WITH-HOLDING TAXES ON INTEREST (PW: 97):

48% w/hold tax payable when:

- money is secured by debentures of the company or money used to acquire assets
- money lodged with a company for interest.

Care should taken in structuring the loans so as to avoid the 48 per cent tax rate.

Does not apply to companies engaged in mining or petroleum operations if money used for developing those operations (IWGMI: 20).

Cell: J116

Note: WITH-HOLDING TAXES ON MAN. FEES (PW: 119):

On payments to contractors hired from outside PNG, a rate of 17% is levied and pertains to non-residents having 'permanent establishment' in PNG.

Cell: J118

Note: WITH-HOLDING TAXES ON ROYALTIES TO LANDOWNERS (PW: 162):

On mining royalties paid to landowners, a 5% tax is levied.

Cell: J171

Note: LOAN RESTRICTIONS (PW: 27, 42):

Central bank imposes a limit on the loan portion of a foreign investment. Usually the limit is set at maximum of 3:1 debt:equity ratio. Exemptions do exist for companies undertaking mining and petroleum exploration. There is a one year moratorium before instalments on the principal can be repaid. A 2:1 limit is set for local borrowings. No limits are applied in respect of mineral exploration businesses.

Cell: J172

Note: INTEREST FOR TAX (PW: 97):

Generally deductible for tax purposes provided principal amount borrowed for purposes of earning taxable income. Can only be carried forward seven years for purposes of being offset against future taxable income.

Cell: J223

Note: GENERAL TAX ISSUES (PW: 103):

A foreign investor may operate in PNG as a branch or a subsidiary. Most investors choose the subsidiary as the operating entity.

Main difference in tax structure is that the branch is taxed at 48% and the subsidiary is taxed at 35% plus a 17% with-holding tax on dividends paid.

Cell: J224

Note: COMPUTATION OF TAXABLE INCOME (PW: 95-102, 105-107):

Taxable income is calculated as gross income less, for example:

business expenses, depreciation, exploration and development, research and development, exchange losses, net interest expenses, royalties, service fees, bad debts.

Tax losses from one mining lease can typically be offset against taxable profits on another, i.e. the concept of 'ring-fencing' applies.

Cell: J226

Notes: TAX UNIT VALUE: N/A to PNG.

Cell: J238

Notes: CORPORATE TAX RATES (PW: 157):

Profits of corporations are taxed at the top rate of 35%. It has been proposed that this be reduced in 1995 to 25% but the production royalty has been increased from 1.25 per cent to 2 per cent.

Cell: J239

Notes: BRANCH TAX RATE (PW: 103):

Branches of foreign corporations are taxed at the higher tax rates as shown. The with-holding tax does not apply, however.

Cell: J323

Notes: INVESTMENT RECOVERY PERIOD (IRP) (PW: 108):

The IRP begins with the receipt of the first income and ends when the net total income exceeds the total initial investment in exploration and development. Accelerated capital write-off against taxable income is allowed, thereby reducing tax payable and shortening the investment payback period.

Cell: J324

Notes: TARGET INCOME RATE:

The target income rate is the after-tax return on the initial capital invested to develop the project.

Cell: J327

Notes: ADDITIONAL PROFITS TAX (APT) (PW: 108) ; (Kumar: 144):

The tax rate applied (70%-corp. tax rate) to the excess of income after a specified return on capital invested has been reached. The specified return can be either a flat rate (20 per cent for PNG) or the U.S. prime rate plus a premium (12 per cent for PNG) dependent on the taxpayer's one time election.

Cell: J328

Notes: NET CASHFLOW FOR APT (IWGMI: 19):

As applied to the case of PNG, the annual cashflow to offset against total capital invested is calculated as follows:

All assessable income (excl. interest earned),
less;
all costs in deriving income, excluding depreciation, residual capital and exploration, prior year tax losses and interest on loans,
less;
allowable capital and exploration expenditure and cost of plant,
less;
mining income tax in years,
plus/less;
the change in value of the average value of depreciables.

Cell: J333

Notes: LOSSES CARRIED OVER FOR TAX (PW: 101):

The period allowed for tax losses to be carried forward to be offset against future income. Losses may not be carried backwards.

NOTE: Period allowed for in the simulation formula is 1-8 years. If more than this then assumed 20 years or indefinite.

Cell: J334

Notes: DEPLETION ALLOWANCE (GOLD AND SILVER): Not applicable to PNG.

Cell: J340

Notes: DEPLETION ALLOWANCE (OTHER MINERALS): Not applicable to PNG.

Cell: J345

Notes: ACTUAL RATES:

The rates shown are those normally determined by the tax office for straight line depreciation.

Cell: J345

Notes: STRAIGHT LINE DEPRECIATION (PW: 95, 107, 158) ; (IWGMI: 13):

Capital expenditure deducted from taxable income at a rate of 10% (10 years) per annum or the remaining life of the mine, whichever is the lesser figure.

Cell: K345

Notes: DECLINING BALANCE:

The depreciation rate for the DB method is automatically 50% higher than that applied for Straight Line method.

Cell: 1372

Note: EXPLORATION DEDUCTION (PW: 107):

Allowance calculated by dividing the undeducted balance of exploration expenditure by 5 or the remaining life of the mine, whichever is the lesser. The exploration expenditure cannot be carried forward for more than 11 years.

	F	G	H	I	J	K
1	COUNTRY CRITERIA	NB: Blocked or shaded cells indicate conditions are attached. Refer to notes as per respective cell addresses.				
2	SIMULATION MODEL					
3						
4	COUNTRY CRITERIA MODULE					
5						
6	CRITERIA HEADINGS	SOUTH AFRICA				
11	ECONOMIC INDICES	NOTES				
14						
15	COUNTRY INFLATION RATE	18.0%				
20						
21	EXCHANGE RATE (PER US\$)	3.70				
43		RAND PER US\$				
44	COUNTRY SPECIFIC FACTORS					
45						
46	PROD. ROYALTY ON COPPER	NOTE				
47	PRICE RANGE	MIN. 0.0% MAX. 0.0%				
48	PROD. ROYALTY ON GOLD	0.0% 0.0%				
49	PRICE RANGE	\$0 \$0				
50	EXPORT ROYALTY	0.00%				
51	TAX ON ALLUVIAL GOLD	0.0% 0.0%				
52						
56	SALES TAXES / VAT	VAT 0.0% ZERO RATED				
58	SOCIAL SECURITY CHARGES	11.0% 0.13%				
59	TRAINING EXPENSES	0.0%				
61	CUSTOMS DUTIES	10.0%				
64	LAND/BUILDING TAXES	0.0%				
65	DEAD RENT	\$0.0				
66	STAMP DUTIES	0.0%				
67	REAL ESTATE TAX	0.0%				
68	CAPITAL TAX	0.00% 0.00%				
69	MINING CONCESSION FEES	0.00 0.00				
70	EXCISE TAX: AUTO FUEL	0.00				
71	EXCISE TAX: DIESEL	0.00				
72						
77	ROYALTIES (NON-GOVN.)	2.5%				
80						
81	CORPORATE TAX REGIME					
82						
86	COMPANY TAXATION	SEE TAX NOTE BELOW				
90	TAX CREDITS					
92	ADDITIONAL PROFITS TAX	SEE APT NOTES BELOW				
93	PROVINCIAL/LOCAL TAXES	0.0%				
97	INTEREST CHARGE BY LOCAL BANK	0.0%				
98	EMPLOYEES' SHARE OF PROFITS	0.0%				
99	PERCENTAGE OF INCOME	0.0%				
100	MAXIMUM BONUS AMOUNT	0 \$0.0				
105						
106	WITHHOLDING TAXES ON:					
107						
108	DIVIDENDS: SUBSIDIARY	0.0%				
109	DIVIDENDS: BRANCH	0.0%				
110						
111	ROYALTIES: NON-ASSOC.	10.0%				
112	ROYALTIES: ASSOCIATE	0.0%				
113						
114	LOAN INTEREST	0.0%				
115						
116	MANAGEMENT FEES	30.0%				
117	(to non-residents)					
118	ROYALTIES TO LANDOWNERS	0.0%				
169						
170	EQUITY AND LOAN FINANCE SCHEDULE					
171		NOTES				
172		NOTES				
173						
223	TAXATION CALCULATION SCHEDULE	NOTES				
224		NOTES				
225						
226	MONTHLY TAX UNIT	0.0				

	F	G	H	I	J	K
1	COUNTRY CRITERIA	NB: Blocked or shaded cells indicate conditions are attached. Refer to notes as per respective cell addresses.				
2	SIMULATION MODEL					
3						
4	COUNTRY CRITERIA MODULE					
5						
6	CRITERIA HEADINGS	SOUTH AFRICA				
11	ECONOMIC INDICES	NOTES				
14						
15	COUNTRY INFLATION RATE	10.0%				
20						
21	EXCHANGE RATE (PER US\$)	3.75 RAND PER US\$				
43						
44	COUNTRY SPECIFIC FACTORS					
45						
46	PROD. ROYALTY ON COPPER	NOTES				
47	PRICE RANGE	MIN. 0.0% MAX. 0.0%				
48	PROD. ROYALTY ON GOLD	0.0% 0.0%				
49	PRICE RANGE	\$0 \$0				
50	EXPORT ROYALTY	0.00%				
51	TAX ON ALLUVIAL GOLD	0.0% 0.0%				
52						
56	SALES TAXES / VAT	VAT 0.0% ZERO RATED				
58	SOCIAL SECURITY CHARGES	11.4% 0.13%				
59	TRAINING EXPENSES	0.0%				
61	CUSTOMER DUTIES	30.0%				
64	LAND/BUILDING TAXES	0.0%				
65	DEAD RENT	0.0% 0.0%				
66	STAMP DUTIES	0.0%				
67	REAL ESTATE TAX	0.0%				
68	CAPITAL TAX	0.00% 0.35%				
69	MINING CONCESSION FEE	0.00 0.00				
70	EXCISE TAX: AUTO FUEL	0.0%				
71	EXCISE TAX: DIESEL	0.0%				
72						
77	ROYALTIES (NON-GOVN.)	2.5%				
80						
81	CORPORATE TAX MODS					
82						
86	COMPANY TAXATION	SEE TAX NOTE BELOW				
90	TAX CREDITS					
92	ADDITIONAL PROFITS TAX	SEE APT NOTES BELOW				
93	PROVINCIAL/LOCAL TAXES	0.0%				
97	INTEREST CHARGE BY LOCAL BANK	0.0%				
98	EMPLOYEES' SHARE OF PROFITS	0.0%				
99	PERCENTAGE OF INCOME	0.0%				
100	MAXIMUM BONUS AMOUNT	0 50.0				
105						
106	WITHHOLDING TAXES ON					
107						
108	DIVIDENDS: SUBSIDIARY	0.0%				
109	DIVIDENDS: BRANCH	0.0%				
110						
111	ROYALTIES: NON-ASSOC.	30.0%				
112	ROYALTIES: ASSOCIATE	0.0%				
113						
114	LOAN INTEREST	0.0%				
115						
116	MANAGEMENT FEES	30.0%				
117	(to non-residents)					
118	ROYALTIES TO LANDOWNERS	0.0%				
169						
170	EQUITY AND LOAN FINANCE SCHEDULE					
171		NOTES				
172		NOTES				
173						
223	TAXATION CALCULATION SCHEDULE	NOTES				
224		NOTES				
225						
226	MONTHLY TAX UNIT	0.0				

	F	G	H	I	J	K
1	COUNTRY CRITERIA		NB: Blocked or shaded cells indicate conditions are attached. Refer to notes as per respective cell addresses.			
2	SIMULATION MODEL					
3						
4	COUNTRY CRITERIA MODULE					
5						
6	CRITERIA HEADINGS		SOUTH AFRICA			
227	TAX RATE ON NON-MINING INCOME		25.0%			
228	ORDINARY COMPANY TAX RATE		15.0%			
229	SECONDARY TAX ON COMPANIES		25.0%			
236						
237	TAXATION RATES:		INV. REC.	NORMAL	OTHER	
238	SUBSIDIARY		PERIOD	STATUS	FACTORS	
239	BRANCH		55.0%	55.0%	290	
240	SURCHARGES		55.0%	55.0%	0.0	
241	ALLOWANCE ON CAPEX: TAX %		12.0%			
319						
320	CONDITIONAL TAX CALCULATIONS:					
321						
323	INVESTMENT RECOVERY PERIOD		MONTHS			
324	TARGET INCOME		0.0%			
326						
327	ADDITIONAL PROFITS TAX (APT)		0.0%			
328	NET CASHFLOW (EXCLUDING INTEREST & DEPREC.)					
329	NPV AT 10% PRIME + STIPULATED % P.A.		12.0%			
330						
333	ANNUAL LOSS COUNTER		200		YEARS	
338	DEPLETION ALLOWANCES:					
339	GOLD & SILVER SALES		0.0%			
340	OTHER METALS/MINERALS		0.0%			
343						
344	CAPITAL EXPENDITURE SCHEDULE:					
345			NOTE	STRAIGHT	DECLINING	
346				LINE	BALANCE	
347				1.00	0.00	
348				FLAG: Y = 1.00		
349	MINING MACHINERY/PLANT			100.0%	100.0%	
350	SMELTING/REFINING PLANT			100.0%	100.0%	
351	BUILDINGS, MINESITE PREP.			10.0%	100.0%	
352	SHIPS/STEAMERS			100.0%	100.0%	
353	EARTHMOVING EQUIP.			100.0%	100.0%	
354	BUILDINGS/STEEL			100.0%	100.0%	
355	BUILDINGS/WOOD, PRE-FAB.			100.0%	100.0%	
356	MAG. SURVEY EQUIP.			100.0%	100.0%	
357	COMPUTERS			20.0%	100.0%	
358	FURNITURE/FITTINGS			5.0%	100.0%	
359	OTHER OFFICE EQUIP.			100.0%	100.0%	
360	MOTOR VEHICLES:			20.0%	100.0%	
361	CONCRETE MIXERS			100.0%	100.0%	
362	IMMERSION VIBRATORS			100.0%	100.0%	
363	CRANES			100.0%	100.0%	
364	AIR-CONDITION PLANT			100.0%	100.0%	
365	VEHICLE REPAIR EQUIP.			10.0%	100.0%	
366	PORTABLE SLEEPING UNITS			100.0%	100.0%	
367	CARPETS			100.0%	100.0%	
368	POWER TOOLS (HAND)			100.0%	100.0%	
369						
370	CAPITALIZED OP. EXPENSES			100.0%	0.0%	
371						
372	EXPLORATION EXPENDITURE		1.0%	100.0%	0.0%	
373	MINERAL CLAIMS COSTS (10% OF EXPLOR.)		20.0%	5.0%	0.0%	
374						
375						
376	SOURCES OF DATA:		Price Waterhouse (PW, 1994b)			
377			IWGMI (1993d)			
378						
379						
380						

	F	G	H	I	J	K
1	COUNTRY CRITERIA	NB: Blocked or shaded cells indicate				
2	SIMULATION MODEL	conditions are attached. Refer to notes				
3		as per respective cell addresses.				
4	COUNTRY CRITERIA MODULE					
5						
6	CRITERIA HEADINGS	SOUTH AFRICA				
227	TAX RATE ON NON-MINING INCOME	25.0%				
228	ORDINARY COMPANY TAX RATE	25.0%				
229	SECONDARY TAX ON COMPANIES	25.0%				
236		INV. REC.	NORMAL	OTHER		
237	TAXATION RATES	PERIOD	STATUS	FACTORS		
238	SUBSIDIARY	50.0%	50.0%	250		
239	BRANCH	30.0%	50.0%			
240	SURCHARGES			0.0		
241	ALLOWANCE ON CAPEX: TAX %			12.0%		
319						
320	CONDITIONAL TAX CALCULATIONS					
321						
323	INVESTMENT RECOVERY PERIOD	1.00 YEARS				
324	TARGET INCOME	5.0%				
326						
327	ADDITIONAL PROFITS TAX (APT)	0.0%				
328	NET CASHFLOW (EXCLUDING INTEREST & DEPREC.)					
329	NPV AT US PRIME + STIPULATED % P.A.	12.0%				
330						
333	ANNUAL LOSS COUNTER	25.0				YEARS
338	DEPLETION ALLOWANCES:					
339	GOLD & SILVER SALES	0.0%				
340	OTHER METALS/MINERALS	0.0%				
343						
344	CAPITAL EXPENDITURE SCHEDULE					
345		NOTE	STRAIGHT	DECLINING		
346			LINE	BALANCE		
347			1.00	0.00		
348			FLAG: V = 1.00			
349	MINING MACHINERY/PLANT		100.0%	100.0%		
350	SMELTING/REFINING PLANT		100.0%	100.0%		
351	BUILDINGS, MINESITE PREP.		10.0%	100.0%		
352	SHIPS/STEAMERS		100.0%	100.0%		
353	EARTHMOVING EQUIP.		100.0%	100.0%		
354	BUILDINGS/STEEL		100.0%	100.0%		
355	BUILDINGS:WOOD, PRE-FAB.		100.0%	100.0%		
356	MAG. SURVEY EQUIP.		100.0%	100.0%		
357	COMPUTERS		20.0%	100.0%		
358	FURNITURE/FITTINGS		5.0%	100.0%		
359	OTHER OFFICE EQUIP.		100.0%	100.0%		
360	MOTOR VEHICLES		20.0%	100.0%		
361	CONCRETE MIXERS		100.0%	100.0%		
362	IMMERSION VIBRATORS		100.0%	100.0%		
363	CRANES		100.0%	100.0%		
364	AIR-CONDITION PLANT		100.0%	100.0%		
365	VEHICLE REPAIR EQUIP.		10.0%	100.0%		
366	PORTABLE SLEEPING UNITS		100.0%	100.0%		
367	CARPETS		100.0%	100.0%		
368	POWER TOOLS (HAND)		100.0%	100.0%		
369						
370	CAPITALIZED OP. EXPENSES		100.0%	0.0%		
371						
372	EXPLORATION EXPENDITURE	1.00	100.0%	0.0%		
373	MINERAL CLAIMS COSTS (10% OF EXPLOR.)	20.0%	5.0%	0.0%		
374						
375						
376	SOURCES OF DATA:	Price Waterhouse (PW, 1994b)				
377		IWGMI (1993d)				
378						
379						
380						

Cell: I11

Notes: GENERAL BUSINESS PROCEDURES (PW: 49-58, 83, 99):

Foreign investment into S.A. requires approval by the exchange control authorities (Reserve Bank). There is a preference for equity capital rather than by way of loans. There is no restriction to the level of foreign ownership.

The most common form of business entity for foreign corporate investors is the private limited company.

Foreign loan finance will usually be allowed provided that there is sufficient equity capital to cover fixed asset requirements.

Local loan finance to foreign investors is restricted, e.g. if 100 per cent foreign owned then borrowings allowed to 50 per cent of foreign capital invested. If partially owned with resident investors then a formula is applied.

There are no restrictions on capital repatriation. Until recently (1995) these transactions had to take place through the financial rand mechanism, which traded at a discount to the commercial rand ranging from 10-40 per cent. The discount depends on investors' perceptions of sovereign and related risks.

Likewise there are no restrictions on transfer of profits and dividends. These were not transferred through the financial rand but the commercial rand. There is usually no restriction on the transfer of interest, royalties and service fees provided market related rates apply.

Cell: J11

Notes: MINING PROCEDURES:

Cell: I46

Notes: ROYALTIES FOR S.A.:

The lease royalty, or state's share of profits, fell away as from 1 January 1994. The royalty was calculated by formula, similar in structure to the gold mining tax, but not as high. The amount was tax deductible.

Cell: J56

Notes: VAT OR SALES TAXES (PW: 77, 134, 226):

An invoice based VAT of 14 per cent applies to most transaction. All exported goods are zero-rated which means that most mining businesses can claim the VAT charge as a refund.

Cell: J58

Notes: SOCIAL SECURITY (PW: 107-108, 169):

PAYROLL LEVY: Based on the amount paid to employees, the rate varies from 0.275% TO 0.3%. The levy is deductible for tax purposes and is paid to the Regional Services Councils.

UNEMPLOYMENT INSURANCE: 1% of eligible employees' wages paid by the employer and 1% paid by employee. Assumed 50% of wage bill represents eligible employees.

PENSIONS: Contributions shared between company and employee, each contribution being of the order of 3 per cent of gross salary.

MEDICAL: 6 per cent of salary on average paid by employer.

Total for purposes of this simulation is $5\% + (50\% \text{ of } 1\%) + 0.3\% + 6\% = 11.8\%$ to the employer's account and are tax deductible.

Cell: K58

Notes: REGIONAL LEVIES (PW: 134, 230):

PAYROLL: Based on the amount paid to employees, the rate varies from 0.275% TO 0.3%. The levy is deductible for tax purposes, (included in Social Security payments as based on salaries).

ESTABLISHMENT: Levies range between 0.10% and 0.15% on sales in the ordinary course of business. The levy is deductible for tax purposes.

Levies are paid to Regional Services Councils.

Cell: J61

Notes: CUSTOMS DUTIES (PW: 77):

20 per cent of the sub-headings in the customs tariff are duty free. Most of the remainder carry duty rates between 3 and 25 per cent and some items can be as much as 100 per cent. Assume 10 per cent on imported items for purposes of the exercise.

Cell: J64

Notes: PROPERTY TAXES:

See real estate tax note.

Cell: J65

Notes: DEAD RENT CONSTRUCTION PERIOD: N/A to South Africa.

Cell: I11

Notes: GENERAL BUSINESS PROCEDURES (PW: 49-58, 83, 99):

Foreign investment into S.A. requires approval by the exchange control authorities (Reserve Bank). There is a preference for equity capital rather than by way of loans. There is no restriction to the level of foreign ownership.

The most common form of business entity for foreign corporate investors is the private limited company.

Foreign loan finance will usually be allowed provided that there is sufficient equity capital to cover fixed asset requirements.

Local loan finance to foreign investors is restricted, e.g. if 100 per cent foreign owned then borrowings allowed to 50 per cent of foreign capital invested. If partially owned with resident investors then a formula is applied.

There are no restrictions on capital repatriation. Until recently (1995) these transactions had to take place through the financial rand mechanism, which traded at a discount to the commercial rand ranging from 10-40 per cent. The discount depends on investors' perceptions of sovereign and related risks.

Likewise there are no restrictions on transfer of profits and dividends. These were not transferred through the financial rand but the commercial rand. There is usually no restriction on the transfer of interest, royalties and service fees provided market related rates apply.

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Cell: I46

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An invoice based VAT of 14 per cent applies to most transaction. If exported goods are zero-rated which means that most mining businesses can claim the VAT charge as a refund.

Cell: J58

Notes: SOCIAL SECURITY (PW: 107-108, 169):

PAYROLL LEVY: Based on the amount paid to employees, the rate varies from 0.275% TO 0.3%. The levy is deductible for tax purposes and is paid to the Regional Services Councils.

UNEMPLOYMENT INSURANCE: 1% of eligible employees' wages paid by the employer and 1% paid by employee. Assumed 50% of wage bill represents eligible employees.

PENSIONS: Contributions shared between company and employee, each contribution being of the order of 5 per cent of gross salary.

MEDICAL: 6 per cent of salary (an average paid by employer).

Total for purposes of this simulation is $5\% + (50\% \text{ of } 1\%) + 0.3\% + 6\% = 11.8\%$ to the employer's account and are tax deductible.

Cell: K58

Notes: REGIONAL LEVIES (PW: 134, 230):

PAYROLL: Based on the amount paid to employees, the rate varies from 0.275% TO 0.3%. The levy is deductible for tax purposes. (Included in Social Security payments as based on salaries).

ESTABLISHMENT: Levies range between 0.10% and 0.15% on sales in the ordinary course of business. The levy is deductible for tax purposes.

Levies are paid to Regional Services Councils.

Cell: J61

Notes: CUSTOMS DUTIES (PW: 77):

20 per cent of the sub-headings in the customs tariff are duty free. Most of the remainder carry duty rates between 5 and 25 per cent and some items can be as much as 100 per cent. Assume 10 per cent on imported items for purposes of the exercise.

Cell: J64

Notes: PROPERTY TAXES:

See real estate tax note.

Cell: J65

Notes: DEAD RENT CONSTRUCTION PERIOD: N/A to South Africa.

Cell: K65

Note: DEAD RENT FOR OPERATING PERIOD: N/A to South Africa.

Cell: J66

Note: STAMP DUTIES (PW: 265):

Payable on a variety of transactions and documents. Difficult to estimate and is negligible in the context of the whole project.

Cell: J67

Note: REAL ESTATE TAX (PW: 233):

Rates are levied on all properties, including unoccupied and undeveloped land and buildings. Values are set by municipalities every three or more years. Rates are tax deductible for businesses.

Cell: J68

Note: COMPANY FORMATION TAX (PW: 86):

Registration fee of R350. Share capital duty set at R5 per R1000 (or 0.5%) of the nominal value of the authorised share capital. Legal costs relating to the registration of a company vary considerably, depending on the complexity of the memorandum and articles of association.

Cell: K68

Note: SHARE ISSUE TAXES (PW: 86):

Stamp duty of 5 cents per R20 (or 0.25% of value) is payable on the nominal plus premium value of the shares issued.

Cell: J70

Note: EXCISE TAX: AUTO FUEL

Assumed negligible in terms of scale of operation.

Cell: J71

Note: EXCISE TAX: ON DIESEL FUEL

Assumed negligible in terms of scale of operation.

Cell: J77

Note: NON-GOVERNMENT ROYALTIES (PW: 168):

To be scrutinised by the government to ensure that the rate is not excessive. Royalties of this nature are tax deductible.

Cell: J98

Note: MANDATORY PROFIT SHARE: N/A to South Africa.

Cell: J108

Note: WITH-HOLDING TAXES ON DIVIDENDS (PW: 189-191):

15% was payable up to 1st October 1995. The tax was scrapped in the 1995 budget speech to come into line with the non-resident's tax of NIL on interest bearing investments.

Cell: J111

Note: WITH-HOLDING TAX ON ROYALTIES (PW: 21):

Payments of royalties to non-residents need to be approved by exchange control authorities. The NRST levied is 30% subject to treaty arrangements with some countries.

Cell: J114

Note: WITH-HOLDING TAX ON INTEREST (PW: 173, 190):

No NRST is payable on interest bearing investments or loans after March 1988.

Cell: J116

Note: WITH-HOLDING TAX ON MAN. FEES (PW: 21):

Generally fees to 4% of working costs and 6% of capital costs will be allowed. A withholding tax of 30% is levied, however.

Cell: J171

Note: LOAN RESTRICTIONS (PW: 50-54):

Borrowers are restricted on the level of local borrowing. This is calculated as a percentage of the total effective capital or the net worth of company. For example, owning 100% of the local company entitles borrowing up to 50% of net worth.

Cell: J172

Note: INTEREST FOR TAX (PW: 167):

Generally deductible for tax purposes provided principal amount borrowed for the business of earning taxable income.

Cell: J233

Notes: GENERAL TAX ISSUES (PW: 173, 135):

Branch entities of foreign companies are treated the same as locally registered companies. The branch, however, may remit its after-tax profit without payment of the withholding tax. Also, the initial losses may be written off against the income of the foreign company from other sources within South Africa.

Cell: J224

Notes: COMPUTATION OF TAXABLE INCOME (PW: 163):

Taxable income is gross income less any expenses:

- incurred in the carrying on of trade,
- in production of income,
- not of a capital nature.

Cell: J226

Notes: TAX UNIT VALUE: Applicable to Chile.

Cell: J227

Notes: NON-MINING INCOME (PW: 179):

Tax rate on non-mining income is different to the formula tax. If mining expenditures (excluding capital but including exploration expenses) exceeds mining income to create a loss, the loss can be offset against non-mining income for tax purposes. This can be carried forward to be offset against future mining and non-mining income.

Cell: J228

Notes: ORDINARY COMPANY TAX RATES (PW: 245):

For the tax year to 31 March 1994 the tax rate was reduced to 40% from 48% but a secondary tax on companies was introduced at 15% of net dividend declared. From March 1994 the tax rate was reduced to 25% and the STC rate was increased to 25% of the net dividend paid.

Gold mining companies had the option of retaining the old formula tax system and most accepted the latter (see below).

Cell: J238

Notes: TAXATION RATES (PW: 180):

The formula tax applies to gold mining businesses exempt from STC:

$Y = 58 - 290/X$ where;

Y is the percentage tax payable.

X = Profit/revenue written as a percentage, i.e. 0.5 would read 50.

Non-mining income is taxed at 48 per cent.

Cell: K241

Notes: CAPITAL ALLOWANCES:

An allowance on capital granted at 12 per cent for post-1990 gold mines for a period until all capital redeemed against taxable income.

The allowance of 12 per cent also granted for deep level mines, i.e. most production sourced from depths > 750m feet. The allowance continues for a period of ten years.

Cell: J323

Notes: INVESTMENT RECOVERY PERIOD: N/A to South Africa.

Cell: J324

Notes: TARGET INCOME RATE: N/A to South Africa.

Cell: J327

Notes: ADDITIONAL PROFITS TAX: N/A to South Africa.

Cell: J331

Notes: LOSSES CARRIED OVER FOR TAX (PW: 172):

The period allowed for carry forward of tax losses to be offset against future income. In the case of S.A. this period is indefinite provided the company does not stop trading completely. Losses may not be carried backwards.

NOTE: The simulation formula caters for periods of 1 - 8 years. Any period more than this is set at 20 years or indefinite.

Cell: J339

Note: DEPLETION ALLOWANCE (GOLD AND SILVER): Not applicable to S.A.

Cell: J340

Note: DEPLETION ALLOWANCE (OTHER MINERALS): Not applicable to S.A.

Cell: I345

Note: DEPRECIATION FOR TAX (FW: 179):

Capital expenditure for mining businesses is allowable in the year incurred with the exception of mine housing, social infrastructure, railways (10 year write-off) and employees' motor vehicles (5 year write-off).

Cell: I372

Note: DEDUCTION OF EXPLORATION COSTS (FW: 178):

Generally fully deductible against mining income. Includes costs for surveys, boreholes, trenches, pits, and any other work of an establishment nature.

Cell: I373

Note: COSTS OF MINERAL RIGHTS (IWGMI: 16):

Not allowable for deduction against taxable income.

	F	G	H	I	J	K
1	COUNTRY CRITERIA	NB: Blocked or shaded cells indicate conditions are attached. Refer to notes as per respective cell addresses.				
2	SIMULATION MODEL					
3						
4	COUNTRY CRITERIA MODULE					
5						
6	CRITERIA HEADINGS	ZIMBABWE				
11	ECONOMIC INPUTS	NOTES		NOTES		
14						
15	COUNTRY INFLATION RATE	24.0%				
20						
21	EXCHANGE RATE (PER US\$)	5.00 Z-DOLLAR PER US\$				
43						
44	COUNTRY SPECIFIC FACTORS					
45		MIN.		MAX.		
46	PROD. ROYALTY ON COPPER	0.0%		0.0%		
47	PRICE RANGE	\$0.00		\$0.00		
48	PROD. ROYALTY ON GOLD	0.0%		0.0%		
49	PRICE RANGE	\$0		\$0		
50	EXPORT ROYALTY	0.00%				
51	TAX ON ALLUVIAL GOLD	0.0%		0.0%		
52						
56	SALES TAXES / VAT	SALES TAX		10.0%		
58	SOCIAL SECURITY CHARGES			11.0%		
59	TRAINING EXPENSES			0.0%		
61	CUSTOMS DUTIES			0.0%		
64	LAND/BUILDING TAXES			0.0%		
65	ROAD RENT	\$0.0		\$0.0		
66	STAMP DUTIES	10.0				
67	REAL ESTATE TAX	0.0%				
68	CAPITAL TAX	NOTE		0.00%		1.00%
69	MINING CONCESSION FEES	NOTE		0.00		0.00
70	EXCISE TAX: AUTO FUEL	0.00				
71	EXCISE TAX: DIESEL	0.00				
72		0.00				
77	ROYALTIES (NON-GOVN.)	2.5%				
80						
81	CORPORATE TAX REGIME					
82						
86	COMPANY TAXATION	SEE TAX NOTE BELOW				
89	TAX CREDITS					
92	ADDITIONAL PROFITS TAX	SEE APT NOTES BELOW				
93	PROVINCIAL/LOCAL TAXES	0.0%				
97	INTEREST CHARGE BY LOCAL BANK	10.0%				
98	EMPLOYEES' SHARE OF PROFITS	0.0%				
99	PERCENTAGE OF INCOME	0.0%				
100	MAXIMUM BONUS AMOUNT	0		\$0.0		
105						
106	WITHHOLDING TAXES ON:					
107						
108	DIVIDENDS: SUBSIDIARY	10.0%				
109	DIVIDENDS: BRANCH	0.0%				
110						
111	ROYALTIES: NON-ASSOC.	CHECK THIS FOR M		10.0%		
112	ROYALTIES: ASSOCIATE	0.0%				
113						
114	LOAN INTEREST	10.0%				
115						
116	MANAGEMENT FEES	25.0%				
117	(to non-residents)					
118	ROYALTIES TO LANDOWNERS	0.0%				
169						
170	EQUITY AND LOAN FINANCE SCHEDULE					
171		NOTES				
172		NOTES				
173						
222						
223	TAXATION CALCULATION SCHEDULE	NOTES				
224		NOTES				
225						
226	MONTHLY TAX UNIT	0.0				

	F	G	H	I	J	K
1	COUNTRY CRITERIA		NB: Blacked or shaded cells indicate conditions are attached. Refer to notes as per respective cell addresses.			
2	SIMULATION MODEL					
3						
4	COUNTRY CRITERIA MODULE					
5						
6	CRITERIA HEADINGS		ZIMBABWE			
236			INV. REC. PERIOD		NORMAL STATUS	OTHER FACTORS
237	TAXATION RATES:		37.5%		37.5%	0
238	SUBSIDY					
239	BRANCH		45.5%		45.5%	
240	SURCHARGES					0.0
241	ALLOWANCE ON CAPEX: TAX %					0.0
319						
320	CONDITIONAL TAX CALCULATIONS:					
321						
323	INVESTMENT RECOVERY PERIOD		NOTES			
324	TARGET INCOME		5.0%			
326						
327	ADDITIONAL PROFITS TAX (AP _T)		0.0%			
328	NET CASHFLOW (EXCLUDING INTEREST & DEPREC.)					
329	NPV AT US PRIME + STIPULATED % P.A.		12.0%			
330						
331	ANNUAL LOSS FOR TAX PURPOSES					
333	ANNUAL LOSS COUNTER		20.0 YEARS			
338	DEPLETION ALLOWANCES:					
339	GOLD & SILVER SALES		0.0%			
340	OTHER METALS/MINERALS		0.0%			
343						
344	ENVIRONMENTAL EXPENDITURE SCHEDULE					
345			STRAIGHT LINE		DECLINING BALANCE	
346						
347			NOTES		1.00 0.00	
348			FLAG: Y = 1.00			
349	MINING MACHINERY/PLANT		50.0%		100.0%	
350	SMELTING/REFINING PLANT		50.0%		100.0%	
351	BUILDINGS, MINESITE PREP.		10.0%		100.0%	
352	SHIPS/STEAMERS		100.0%		100.0%	
353	EARTHMOVING EQUIP.		100.0%		100.0%	
354	BUILDINGS/STEEL		100.0%		100.0%	
355	BUILDINGS/WOOD, PRE-FAB.		100.0%		100.0%	
356	MAG. SURVEY EQUIP.		100.0%		100.0%	
357	COMPUTERS		100.0%		100.0%	
358	FURNITURE/FITTINGS		10.0%		100.0%	
359	OTHER OFFICE EQUIP.		100.0%		100.0%	
360	MOTOR VEHICLES		20.0%		100.0%	
361	CONCRETE MIXERS		100.0%		100.0%	
362	IMMERSION VIBRATORS		100.0%		100.0%	
363	CRANES		100.0%		100.0%	
364	AIR-CONDITION PLANT		100.0%		100.0%	
365	VEHICLE REPAIR EQUIP.		10.0%		100.0%	
366	PORTABLE SLEEPING UNITS		100.0%		100.0%	
367	CARPETS		100.0%		100.0%	
368	POWER TOOLS (HAND)		100.0%		100.0%	
369						
370	CAPITALIZED OP. EXPENSES		100.0%		0.0%	
371						
372	EXPLORATION EXPENDITURE		1.00		100.0% 0.0%	
373	MINERAL CLAIMS COSTS (10% OF EXPLOR.)		20.00		5.0% 0.0%	
374						
375						
376	SOURCES OF DATA:		Price Waterhouse (PW, 1990b)			
377			Deloitte & Touche (1994)			
378			Edwards and Co. (1994)			
379			IWGMI (1993c)			
380			IMF (1995)			

Cell: I11

Notes: G) **INVESTMENT PROCEDURES (PW: 34-39) ; (TWGML: 6) ; (Edwards and Co.) :**

All foreign investment has to be approved by the Ministry of Finance, Economic Planning and Development who have vested authority in the Investment Centre and the Reserve bank. There are limits, however, to the amounts that the Investment Centre is entitled to approve.

Foreign investors may use either branch or subsidiary entities, although the authorities prefer the latter - promotes a sense of permanency. The tax burden for the branch entity is marginally higher. 100 per cent foreign ownership is allowed, although some local participation in the equity of the business is preferred.

Prior to about 1993 there were very strict exchange controls in place but these have been relaxed considerably over the past few years. Foreign investors, pursuant to the above channels for investment, are free to transfer funds to and from the country.

Cell: I11

Notes: MINING INVESTMENT PROCEDURES:

MARKETING OF MINERALS: Exports of minerals, except for gold, are controlled by the Minerals Marketing Corporation.

Cell: J56

Notes: GENERAL SALES TAX (Deloitte and Touche: 21) ; (PW: 167-168):

Most goods levied at 10% with certain higher rated goods at 15-20%.

Refunds may be allowed on sales tax and import tax on prescribed goods of a capital nature. Applicable to mining operations in specified locations and/or approved new mining projects.

Cell: J58

Notes: SOCIAL SECURITY (PW: 71):

No comprehensive social security plan is in operation. Membership of a pension plan is normally a condition of employment. The employer and employee each contribute of the order of 6 per cent of gross salary. Medical Aid contributions are also made by each; assumed at 5 per cent of salary.

Cell: J59

Notes: TRAINING ALLOWANCES (PW: 115):

An allowance is given amounting to 50 per cent of the cost of new buildings and equipment used solely for training purposes. Specific mention is made of the mining industry in this regard.

NOTE: Assume 10 per cent of costs of new buildings, furniture and computer equipment is for training purposes.

Cell: J61

Notes: IMPORT DUTIES (Deloitte and Touche: 6):

As of 29th July 1994 duties on all imports of capital goods, except motor vehicles, will be exempt.

Cell: J63

Notes: DEAD RENT CONSTRUCTION PERIOD: N/A to Zimbabwe

Cell: K63

Notes: DEAD RENT FOR OPERATING PERIOD: N/A to Zimbabwe.

Cell: J66

Notes: STAMP DUTIES (PW: 168, 192):

Various duties are payable on transfers of immovable property, share transactions, and mortgage bonds. Assumed negligible for purposes of the simulation exercise.

Cell: I68

Notes: CAPITAL TAXATION:

There is no wealth or tax based on the value of property to a company or individual.

Cell: K68

Notes: CAPITAL TAX (B) (PW: 62, 192):

Tax rate payable on formation of company amounts to 0.2 per cent of the authorised capital. An annual maximum fee of Z\$300 (as at 1990) is payable. Legal fees will vary considerably according to the complexity and size of the deal.

Assumed negligible for purposes of simulation exercise.

Cell: I69

Notes: MINERAL CLAIMS:

Costs of purchasing mineral claims is not deductible for tax purposes.

Cell: J70

Note: EXCISE TAX: AUTO FUEL

Assumed negligible in terms of scale of operation.

Cell: J71

Note: EXCISE TAX: ON DIESEL FUEL

Assumed negligible in terms of scale of operation.

Cell: J77

Note: NON-GOVERNMENT ROYALTIES (PW: 117):

Those scrutinized by the government. Royalties of this nature are tax deductible, however.

Cell: J98

Note: MANDATORY PROFIT SHARE: N/A to Zimbabwe.

Cell: J108

Note: WITH-HOLDING TAX ON DIVIDENDS (PW: 137) : (Deloitte and Touche: 19-21, 24):

20 per cent rate applicable to residents, and non-resident individuals and companies, BUT NOT TO resident companies receiving dividends.

Cell: J111

Note: WITH-HOLDING TAX ON ROYALTIES (PW: 137):

20 per cent rate on royalties to non-residents for use of a wide range of works, patents, formulas, equipment, but excluding the respect of minerals.

Cell: J114

Note: WITH-HOLDING TAX ON INTEREST (PW: 111, 137):

Payments to non-residents is subject to the 10% w/h tax. Also specific mention of this tax being paid on interest on loans to the mining industry. This includes payments to bankers.

Cell: J116

Note: WITH-HOLDING TAX ON MAN. FEES (PW: 112):

Fees for services, e.g. technical, managerial, administrative, consulting, and paid to non-residents, are subject to 20% tax.

Cell: J171

Note: LOAN RESTRICTIONS (PW: 51-52):

The repatriation terms attached to external loans are dealt with when originally approved by the authorities. There are restrictions to foreign investors borrowing on the local market, particularly if their ownership is more than 25 per cent.

Cell: J172

Note: INTEREST & TAX DEDUCTIONS (PW: 116):

Interest is allowable if loans are used for business purposes, which includes financing the acquisition of capital assets.

Interest on loans to finance capital projects, e.g. buildings, is deductible as per allowances attached to the particular asset.

Interest to a foreign parent is deductible, if not excessive, and would be subject to exchange control.

Interest payments to foreign banks is deductible.

Cell: J223

Note: GENERAL TAX ISSUES (Deloitte and Touche: 2, 24) : (PW: 120):

Foreign companies can set up either a branch or subsidiary. There is no pre-requisite for a foreign investor to enter into a JV arrangement with a domestic investor. Some sensitivity is recommended on this issue, however.

The main difference between a branch and a subsidiary is that the branch is subject to the additional profit tax, i.e. 8.4 per cent currently added on to the normal tax rate (now 37.5%). The net effect of these options can vary according to the existence of a tax treaty between Zimbabwe and the country in which the head office or parent company operates.

Cell: J224

Note: COMPUTATION OF TAXABLE INCOME (PW: 113-119):

Taxable income is gross income less, for example:

Business expenses, exploration expenses, interest expenses, inter-company charges, royalties, remuneration (no limits), retirement fund contributions, experiment costs, insurance premiums, depletion (removed 1995), and training allowances.

See below (depreciation - capital breakdown) for deductions in respect of capital expenditure.

No deductions are allowed for costs of mineral claims.

Cell: J226

Note: TAX UNIT VALUE: Applicable to Chile.

Cell: J239

Note: BRANCH PROFITS TAX (PW: 120, 137):

Profits on branch operations are subject to the normal tax plus 8.4 per cent (15 per cent of 56 per cent of taxable income).

Cell: J323

Note: INVESTMENT RECOVERY PERIOD: N/A to Zimbabwe.

Cell: J324

Note: TARGET INCOME RATE: N/A to Zimbabwe.

Cell: J327

Note: ADDITIONAL PROFITS TAX: N/A to Zimbabwe.

Cell: J333

Note: LOSSES CARRIED OVER FOR TAX (PW: 120):

The period allowed for carry forward of tax losses to be offset against future income. Losses may not be carried backwards.

NOTE: The simulation formula caters for periods of 1 - 8 years. Any period more than this is set at 20 years or indefinite.

Cell: J339

Note: DEPLETION ALLOWANCES (Deloitte and Touche: 2):

Up to March 1995 the allowance was 5 per cent of proceeds from the sales of minerals. This amount was then deducted from taxable income, thereby reducing tax payable. NB: The allowance has been scrapped totally as from 1st April 1995.

Cell: J340

Note: DEPLETION ALLOWANCE (OTHER MINERALS): Not applicable to Zimbabwe.

Cell: J347

Note: CAPITAL ALLOWANCES (PW: 124-128) ; (IWGMI: 10-12):

Deductions in respect of capital expenditure are known as the Capital Redemption Allowance (CRA). Any amounts carried forward to subsequent years are termed the unredeemed balance of capital expenditure.

The two methods of deduction are:

Firstly, the life-of-mine basis where the life (in years), as determined by an estimate of ore reserves, is divided into the balance of unredeemed capex.

Secondly, the current capital expenditure basis (CCEB) where the unredeemed balance and current capex can be deducted in the year incurred.

There is no 'ring-fencing' of capex and deductions from one operation can be off-set against the taxable income of another.

No deductions are allowed for costs of mineral claims.

Cell: J372

Note: EXPLORATION NOTE:

Provision does exist for deducting expenses on prospecting etc. for purposes of acquiring mineral rights. Allowed as a deduction in the year of expenditure and can be carried forward.

**COUNTRY CRITERIA
SIMULATION MODEL**
PROJECT MODULE
READ ACROSS

FORECAST OF OPERATIONS		1985	1986	1987	1988	1989	1990	1991	1992
		CALENDAR YEAR							
RELATION RATES:									
U.S.A.		3.4%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.4%
FACTOR BASE:	1985	1.00	1.03	1.06	1.09	1.13	1.16	1.19	1.23
GOLD PRICE:									
REAL	(\$/OZ)	360	380	388	389	380	380	388	380
NOMINAL	(\$/OZ)	380	391	403	415	428	441	454	467
	\$/KG	12217	12384	12861	13358	13751	14145	14583	15026
PRODUCTION DATA:									
MILLED TONS	(\$000)	0	0	0	490	980	1180	1280	1200
RECOVERY GRADE:									
GOLD	(%)	0	0	0	10.00	10.00	10.00	10.00	10.00
EXPENSES:									
GOLD	\$/million	0.0	0.0	0.0	88.1	123.3	178.0	175.1	85.3
MINE RELATED COSTS:									
POWER	\$/ton milled	6.00	6.00	7.00	7.01	7.40	7.45	7.86	8.22
SERVICES/STORES	\$/ton milled	18.68	19.15	19.73	19.33	20.30	21.56	22.31	21.89
HUMAN RESOURCES	\$/ton milled	1.10	24.85	29.32	38.81	31.74	33.49	33.67	34.68
OTHER	\$/ton milled	4.64	4.89	7.00	7.21	7.45	7.45	7.52	8.13
POWER	\$/million	0.0	0.0	0.0	4.3	6.7	9.3	9.5	9.7
SERVICES/STORES	\$/million	0.0	0.0	0.0	12.3	18.8	25.9	26.7	27.5
HUMAN RESOURCES	\$/million	0.0	0.0	0.0	16.5	33.6	39.3	40.4	41.4
OTHER	\$/million	0.0	0.0	0.0	4.3	6.7	9.3	9.4	9.7
TOTAL ON MINE COSTS	\$/million	0.0	0.0	0.0	39.3	69.3	87.5	84.0	86.4
OPERATING PROFIT	\$/million	0.0	0.0	0.0	40.8	60.4	76.3	83.1	91.8
PROFIT/REVENUE RATIO		0.0%	0.0%	0.0%	30.9%	38.9%	38.9%	30.5%	30.9%
DEVELOPMENT EXPLORATION (REAL TERMS)		20.0	7.5	5.0	2.5	2.5	0.0	0.0	0.0
TOTAL EXPLORATION (NOMINAL TERMS)		20.0	7.7	5.3	3.8	4.4	2.2	2.2	2.3
DEVELOPMENT CAPITAL EXPENDITURE (REAL TERMS)		58.0	75.0	50.4	50.0	25.0	10.0	0.0	0.0
TOTAL CAPITAL EXPENDITURE (NOMINAL)		50.4	77.3	55.0	39.7	34.4	24.3	2.3	5.1

**OTHER PROJECT
SPECIFIC PARAMETERS**
CAPITAL EXPENDITURE BREAKDOWN

	PER CENT OF TOTAL	IMPORTED PER CENT
MINING MACHINERY/PLANT	20.0%	20.0%
SMELTING/REFINING PLANT	20.0%	30.0%
BUILDINGS, MINESITE PRIP.	20.0%	0.0%
SHIP/STEAMERS	5.0%	100.0%
EARTHMOVING EQUIP.	5.0%	75.0%
BUILDINGS/STEEL	3.0%	0.0%
BUILDINGS(WOOD, PRE-FAB.	1.0%	0.0%
WAG, FORVEY EQUIP.	1.0%	100.0%
COMPUTERS	0.7%	50.0%
FURNITURE/FITTINGS	0.7%	0.0%
OTHER OFFICE EQUIP.	0.4%	0.0%
MOTOR VEHICLES	0.3%	50.0%
CONCRETE MIXERS	0.3%	0.0%
BARRERSON VIBRATORS	0.3%	0.0%
CRANES	0.3%	100.0%
AIR-CONDITION PLANT	0.3%	0.0%
VEHICLE REPAIR EQUIP.	0.3%	0.0%
PORTABLE SLEEPING UNITS	0.3%	0.0%
CARPETS	0.3%	0.0%
POWER TOOLS (HAND)	0.1%	100.0%
CAPITALIZED OP. EXPENSES	15.0%	0.0%
TOTAL CAPITAL ITEMS	100.0%	25.0%

**COUNTRY CRITERIA
SIMULATION MODEL**
PROJECT MODULE
READ ACROSS

FORECAST OF OPERATIONS		2003	2004	2005	2006	2007	2008	2009	2010
		CALENDAR YEARS							
INFLATION RATES:									
U.S.A.		3.4%	3.4%	3.4%	3.4%	3.4%	3.4%	3.4%	3.4%
FACTOR BASE	1995	1.37	1.30	1.34	1.38	1.43	1.47	1.51	1.56
GOLD PRICE:									
REAL	(\$/OZ)	369	391	388	380	389	380	364	360
NOMINAL	(\$/OZ)	481	496	511	524	541	548	575	592
	\$/G	15477	15941	16419	16912	17419	17942	18481	19034
PRODUCTION DATA:									
MILLED TONS	(+00)	1280	1280	1280	1280	1280	1280	1280	1280
RECOVERY RATES:									
GOLD	(%)	10.81	10.80	10.80	10.80	10.80	10.80	10.80	10.80
REVENUES:									
GOLD	\$/mOunc	183.7	191.1	197.0	203.9	209.8	215.3	221.2	227.4
MINE RELATED COSTS:									
POWER	\$/ton milled	8.36	8.61	8.87	9.14	9.41	9.69	9.98	10.28
SERVICE/TONNES	\$/ton milled	23.36	24.27	25.09	25.79	26.51	27.21	27.93	28.58
HUMAN RESOURCES	\$/ton milled	35.71	36.79	37.95	39.04	40.21	41.41	42.68	43.93
OTHER	\$/ton milled	8.26	8.41	8.67	8.94	9.21	9.49	9.78	10.08
POWER	\$/mOunc	18.0	18.3	18.6	18.9	19.2	19.5	19.8	20.1
SERVICE/TONNES	\$/mOunc	29.3	29.1	28.9	28.7	28.5	28.3	28.1	27.9
HUMAN RESOURCES	\$/mOunc	43.9	44.3	44.5	44.8	45.3	45.7	46.2	46.7
OTHER	\$/mOunc	18.0	18.3	18.6	18.9	19.2	19.5	19.8	20.1
TOTAL ON-MINE COSTS	\$/mOunc	91.3	93.9	96.8	99.7	102.7	105.7	108.9	112.1
OPERATING PROFIT	\$/mOunc	94.5	97.1	100.3	103.3	106.4	109.4	112.9	116.3
PROFIT/REVENUE RATIO		51.5%	51.5%	51.5%	51.5%	51.5%	51.5%	51.5%	51.5%
DEVELOPMENT EXPLORATION: REAL TERMS		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL EXPLORATION: NOMINAL TERMS		2.4	2.4	2.5	2.6	2.7	2.7	2.8	2.9
DEVELOPMENT CAPITAL EXPENDITURE: REAL TERMS		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL CAPITAL EXPENDITURE: NOMINAL		3.5	3.7	3.8	3.9	4.0	4.1	4.2	4.3

**OTHER PROJECT
SPECIFIC PARAMETERS**
SUNDRY PROJECT-SPECIFIC PARAMETERS

MAN. FEES: ON-MINE COSTS	4.0%	50.0%	of costs
MAN. FEES: CAP. EXPENDITURE	6.0%	50.0%	of capex
SALER TAX/VAT ON		50.0%	of trade
LANDBUILDING TAXES	\$1.5	US\$ millions	
PROPERTY/CLAIM SIZE	2000	hectares	
STAMP DUTIES	85.0	US\$ millions	
REAL ESTATE TAX	51.0	US\$ millions	
CAPITAL TAX (AND FORMATION TAX)			
PROPERTY/CLAIM SIZE: FOR FEES	2000	hectares	
ENGINE TAX	2500	cc/kilometre per annum	
AUTO FUEL	5000	cc/kilometre per annum	
DURABLE			
NORMAL TAXATION	FLAG		
SUBSIDIARY	1.00		
BRANCH	0.00		
WITH-HOLDING TAXES			
ON DIVIDENDS:	FLAG		
SUBSIDIARY	1.00		
BRANCH	0.00		
ON ROYALTIES:			
NON-ASSOCIATE	1.00		
ASSOCIATE	0.00		

**COUNTRY CRITERIA
SIMULATION MODEL**
PROJECT MODULE
READ ACROSS

FORECAST OF OPERATIONS		2011	2012	2013	2014	2015	PROJECT TOTALS
		CALENDAR YEARS					
RELATION RATES:							1995 MONEY
U.S.A.		3.9%	3.8%	3.9%	3.9%	3.9%	3.9%
FACTOR BASE:	1995	1.80	1.43	1.79	1.75	1.81	
GOLD PRICE:							
REAL	(\$/OZ)	381	389	381	389	389	
NOMINAL	(\$/OZ)	619	628	647	666	684	380.8
	(\$/KG)	19685	20150	20798	21433	22165	13317.4
PRODUCTION DATA:							
MILLED TONS	(\$/TON)	1280	1130	900	608	498	10860
RECOVERY GRADE:							
GOLD	(g/t)	10.00	10.00	10.00	10.00	10.00	10.00
REVENUE:							
GOLD	\$/million	235.3	243.5	397.5	128.5	105.9	2331.08
MINE RELATED COSTS:							
POWER	\$/ton milled	10.59	10.91	11.34	11.57	11.93	6.69
SERVICES/STORES	\$/ton milled	29.55	30.74	31.67	32.63	33.39	18.60
HUMAN RESOURCES	\$/ton milled	45.13	46.41	48.81	49.43	50.53	28.28
OTHER	\$/ton milled	10.59	10.91	11.34	11.57	11.93	6.69
POWER	\$/million	12.7	13.1	13.1	6.9	5.7	125.93
SERVICES/STORES	\$/million	31.8	36.9	38.5	19.5	16.1	354.89
HUMAN RESOURCES	\$/million	54.3	56.8	59.2	39.7	24.4	538.66
OTHER	\$/million	12.7	13.1	10.1	6.9	8.7	135.03
TOTAL ON-MINE COSTS	\$/million	119.3	119.9	91.9	61.1	51.9	1144.88
OPERATING PROFIT	\$/million	119.7	133.3	153.3	65.4	53.9	1184.28
PROFIT/REVENUE RATIO		51.9%	55.0%	58.9%	50.9%	50.9%	50.9%
DEVELOPMENT/EXPLORATION: REAL TERMS		0.0	0.0	0.0	0.0	0.0	
TOTAL EXPLORATION: NOMINAL TERMS		3.0	3.1	3.4	1.6	1.3	97.16
DEVELOPMENT CAPITAL EXPENDITURE: REAL TERMS		0.0	0.0	0.0	0.0	0.0	
TOTAL CAPITAL EXPENDITURE: NOMINAL		13.8	12.3	9.5	6.5	5.4	378.53

**OTHER PROJECT
SPECIFIC PARAMETERS**

LOAN AND FINANCING DETAILS				DEBT/EQUITY
ORDINARY CAPITAL				0.50
LOAN CAPITAL				0.50
LONG TERM LOANS:	DISTRI-	INTEREST	PAYBACK	
	BUTION	RATE	PERIOD	
LENDER AA	40.0%	10.0%	10	
LENDER BB	20.0%	8.0%	6	
LENDER CC	15.0%	7.0%	4	
LENDER DD	15.0%	3.0%	8	
LENDER EE	10.0%	8.8%	1	
TOTAL	100.0%			

**COUNTRY CRITERIA
SIMULATION MODEL**
SIMULATION MODULE
READ DOWN THEN ACROSS

FORECAST OF OPERATIONS		CALENDAR YEARS	1992	1994	1997	1999	2001	2003	2005
CHILE			ALL FINANCIAL AMOUNTS IN: PESO x 1000 millions UNLESS STATED OTHERWISE						
ECONOMIC INPUTS									
INFLATION RATE:									
U.S.A.	US \$		3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
INFLATION FACTOR TO:	1993		1.00	1.00	1.00	1.00	1.13	1.14	1.19
COUNTRY INFLATION RATE			10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
INFLATION FACTOR TO:	1995		1.00	1.10	1.21	1.33	1.46	1.61	1.77
CURRENCY DEPRECIATION FACTOR			1.00	1.07	1.14	1.22	1.30	1.39	1.48
GOLD PRICE	(\$/OZ)		380	391	402	415	428	441	454
EXCHANGE RATE PPS (US)	PESO x 1000		0.40	0.43	0.46	0.49	0.51	0.54	0.59
OPERATING CASH FLOW COMPONENTS									
		DISTRIBUTION CODES							
GOLD REVENUE			8.00	0.00	0.00	38.25	44.39	54.45	103.39
POWER SERVICES STORES	OMC1		0.00	0.00	0.00	8.25	13.28	19.68	31.43
HUMAN RESOURCES	EMP1		0.00	0.00	0.00	9.01	14.84	21.99	35.02
OTHER ON-MINE COSTS	OMC3		0.00	0.00	0.00	2.11	3.48	5.10	8.61
TOTAL ON-MINE COSTS			0.00	0.00	0.00	19.37	31.63	46.38	81.02
MANAGEMENT FEES	MAN1		0.00	0.00	0.00	0.40	0.76	1.11	1.33
CAPITAL EXPENDITURE	OMC3		34.80	33.88	34.38	38.61	17.92	11.25	5.39
MANAGEMENT FEES	MAN3		0.04	1.38	1.16	1.37	0.84	0.54	0.25
EXPLORATION EXPENDITURE	OMC4		5.00	3.30	2.42	1.83	1.38	1.18	1.31
COUNTRY SPECIFIC FACTORS									
PROD. ROYALTY ON COPPER	RG1		0.00	0.04	0.00	0.00	0.00	0.00	0.00
PROD. ROYALTY ON GOLD	RG2		0.00	0.00	0.00	0.00	0.00	0.00	0.00
EXPORT ROYALTY	RG3		0.00	0.00	0.00	0.00	0.00	0.00	0.00
TAX ON ALLUVIAL GOLD	RG4		0.00	0.04	0.00	0.00	0.00	0.00	0.00
YEAR COUNTER FOR VAT AND IMPORT DUTY HOLIDAY			0.00	0.04	0.00	0.00	0.00	0.00	0.00
SALES TAXES / VAT	HG5		0.00	0.00	0.00	0.00	0.00	0.00	0.00
SOCIAL SECURITY CHARGES	EMP2		0.00	0.00	0.00	0.00	0.00	0.00	0.00
TRAINING EXPENSES	EMP3		0.00	0.00	0.00	0.00	0.00	0.00	0.00
CUSTOMS DUTIES	HG6		0.04	0.00	0.00	0.00	0.00	0.00	0.00
LAND/BUILDING TAXES	HG7		0.00	0.01	0.01	0.01	0.01	0.01	0.01
DEAD WEIGHT	HG8		0.00	0.00	0.00	0.00	0.00	0.00	0.00
STAMP DUTIES	HG9		0.01	0.01	0.01	0.01	0.01	0.01	0.01
REAL ESTATE TAX	HG10		0.01	0.01	0.01	0.01	0.01	0.01	0.01
CAPITAL TAX	HG11		0.00	0.00	0.00	0.00	0.00	0.00	0.00
MINING CONCESSION FEES	HG12		0.00	0.01	0.01	0.01	0.01	0.01	0.01
EXCISE TAX, AUTO FUEL	HG13		0.16	0.17	0.19	0.21	0.23	0.25	0.28
FUEL TAX, DIESEL	HG14		0.18	0.20	0.22	0.25	0.27	0.30	0.33
ROYALTIES (NON-GOWN.)	ROY1		0.00	0.00	0.00	0.00	0.00	0.00	0.00
CORPORATE TAX REGIME									
COMPANY TAXATION	HG15		0.00	0.00	0.00	0.00	0.00	0.00	0.00
TAX CREDIT FOR INV. REC. PERIOD			0.10	0.00	0.00	0.00	0.00	0.00	0.00
TAX CREDITS	HG16		0.00	0.00	0.00	0.00	0.00	0.00	0.00
ADDITIONAL PROFITS TAX	HG17		0.00	0.00	0.00	0.00	0.00	0.00	0.00
PROVINCIAL/LOCAL TAXES	HG18		0.00	0.00	0.00	0.00	0.00	0.00	0.00
LOAN REPAYMENTS	LOAN1		0.00	0.00	0.00	0.00	0.00	11.43	13.43
INTEREST ON LOANS	LOAN2		0.00	0.00	0.00	0.11	0.66	2.18	7.52

**COUNTRY CRITERIA
SIMULATION MODEL**
SIMULATION MODULE
READ DOWN THEN ACROSS

FORECAST OF OPERATIONS		CALENDAR YEARS	1981	1982	1983	1984	1985	1986	1987
CHILE			ALL FINANCIAL AMOUNTS IN: PESO x 1000 millions UNLESS STATED OTHERWISE						
INTEREST CHARGE BY LOCAL BANK	LOAN3		0.00	0.31	0.43	0.55	0.31	0.00	0.00
EMPLOYEES' SHARE OF PROFITS			0.00	0.00	0.00	0.00	0.00	0.00	0.00
PERCENTAGE OF INCOME			0.00	0.00	0.00	1.23	2.73	5.45	5.50
MAXIMUM BONUS AMOUNT			0.00	0.00	0.00	1.23	2.73	5.45	5.50
ACTUAL BONUS PAID	EMP4		0.00	0.00	0.00	0.00	0.00	0.00	0.00
CASHFLOW EARNINGS (NET)	PROJECT		-29.37	-41.14	-33.33	-29.41	1.41	13.80	22.33
PAYBACK PERIOD (NUMBER OF YEARS)			1.00	1.00	1.00	1.00	1.00	1.00	1.00
NPV OF INVESTORS' EARNINGS			-14.03	-33.63	-47.41	-53.97	-53.99	-46.03	-33.43
WITH-HOLDING TAXES ON:									
DIVIDENDS: SUBSIDIARY	HG19		0.00	0.00	0.00	0.00	0.00	0.00	0.00
DIVIDENDS: BRANCH									
ROYALTIES: NON-ASSOC.	HQ		0.00	0.00	0.00	0.00	0.00	0.00	0.00
ROYALTIES: ASSOCIATE									
LOAN INTEREST	HG21		0.00	0.07	0.16	0.24	0.31	0.33	0.30
MANAGEMENT FEES (as percent of income)	HG23		0.19	0.23	0.23	0.37	0.33	0.33	0.30
ROYALTIES TO LANDOWNERS	HG25		0.00	0.00	0.00	0.00	0.00	0.00	0.00
DISTRIBUTION OF FUNDS ANALYSIS									
REVENUE + INITIAL CAPITAL (INFLOWS)			19.87	41.14	33.33	29.44	64.39	94.45	103.59
FORMATION OF DISTRIBUTIONS (OUTFLOWS)			19.87	41.14	33.33	29.44	64.39	94.45	103.59
IN LOCAL CURRENCY (PESO x 1000 millions)									
INVESTORS' EARNINGS (NET OF WHI TAX)			-14.03	-33.63	-47.41	-53.97	-53.99	-46.03	-33.43
DEBT: PRINCIPAL INVESTED/REPAID	LOAN1		-14.03	-33.63	-47.41	-53.97	-53.99	-46.03	-33.43
INTEREST ON LOANS (NET OF WHI TAX)	LOAN2		0.00	0.00	0.00	0.00	0.00	0.00	0.00
ROYALTIES (NET OF WHI TAX)	ROY		0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAN. FEES (NET OF WHI TAX)	MAN		0.19	0.23	0.23	0.37	0.33	0.33	0.30
EMPLOYEES' PAYMENTS	EMP		0.00	0.00	0.00	0.00	0.00	0.00	0.00
OP. COSTS + CAPEX	OMC		20.00	20.00	20.00	20.00	20.00	20.00	20.00
HOST GOVERNMENT RECEIPTS	HG		1.10	1.09	1.02	2.22	1.87	1.35	1.29
IN U.S. CURRENCY (US \$ millions)									
INVESTORS' EARNINGS (NET OF WHI TAX)			-37.34	-81.15	-66.83	-60.93	5.09	21.84	37.63
DEBT: PRINCIPAL INVESTED/REPAID	LOAN1		-37.34	-81.15	-66.83	-60.93	5.09	21.84	37.63
INTEREST ON LOANS (NET OF WHI TAX)	LOAN2		0.00	0.00	0.00	0.00	0.00	0.00	0.00
ROYALTIES (NET OF WHI TAX)	ROY		0.00	0.00	0.00	0.00	0.00	0.00	0.00
MAN. FEES (NET OF WHI TAX)	MAN		1.92	2.37	2.34	3.61	3.40	3.38	3.09
EMPLOYEES' PAYMENTS	EMP		0.00	0.00	0.00	0.00	0.00	0.00	0.00
OP. COSTS + CAPEX	OMC		70.00	70.00	70.00	70.00	70.00	70.00	70.00
HOST GOVERNMENT RECEIPTS	HG		2.75	4.47	4.22	4.57	3.59	2.79	2.55
NET PRESENT VALUE CALCULATIONS									
IN LOCAL CURRENCY (PESO x 1000 millions)									
PROVIDER OF CAPITAL									
EQUITY CAPITAL INVESTED									
EQUITY EARNINGS (NET OF WHI TAXES)									
LOAN CAPITAL INVESTED	PRINCIPAL								
LOAN EARNINGS (NET OF WHI TAXES)	INTEREST								
EMPLOYEE AND SERVICES RECEIPTS									
HOST GOVERNMENT RECEIPTS									
IN U.S. CURRENCY (US \$ millions)									
PROVIDER OF CAPITAL									
EQUITY CAPITAL INVESTED									
EQUITY EARNINGS (NET OF WHI TAXES)									
LOAN CAPITAL INVESTED	PRINCIPAL								
LOAN EARNINGS (NET OF WHI TAXES)	INTEREST								
EMPLOYEE AND SERVICES RECEIPTS									
HOST GOVERNMENT RECEIPTS									
DISCOUNT RATES									
NOMINAL	10.0%	15.0%	21.0%	26.5%	33.0%	40.0%	48.0%	56.0%	64.0%
REAL	8.0%	5.0%	10.0%	15.0%	20.0%	25.0%	30.0%	35.0%	40.0%
NPV	-55.07	-51.36	-49.08	-46.65	-44.32	-42.00	-39.67	-37.34	-35.01
NPV	173.49	173.49	173.49	173.49	173.49	173.49	173.49	173.49	173.49
DISCOUNT RATES									
NOMINAL	8.0%	5.0%	10.0%	15.0%	20.0%	25.0%	30.0%	35.0%	40.0%
REAL	6.0%	3.0%	8.0%	13.0%	18.0%	23.0%	28.0%	33.0%	38.0%
NPV	-137.69	-129.63	-122.49	-116.63	-111.30	-106.41	-101.96	-97.96	-94.41
NPV	288.61	288.61	288.61	288.61	288.61	288.61	288.61	288.61	288.61

**COUNTRY CRITERIA
SIMULATION MODEL**
SIMULATION MODULE
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FORECAST OF OPERATIONS		CALENDAR YEARS	1995	1996	1997	1998	1999	2000	2001
CHILE			ALL FINANCIAL AMOUNTS IN: PESO x 1000 millions UNLESS STATED OTHERWISE						
EQUITY AND LOAN FINANCE SCHEDULE									
YEAR END BALANCES									
ANNUAL CAPITAL INJECTIONS	PESO x 1000 millions		29.87	41.14	33.33	20.41	8.88	0.00	1.80
	US \$ millions		74.67	96.30	75.94	41.90	6.66	0.00	1.88
TOTAL CAPITAL INJECTED	US \$ millions		74.7	171.9	244.8	288.9	288.3	285.9	285.9
EQUITY CAPITAL	50%		37.3	85.5	122.4	143.0	143.8	143.0	143.8
TOTAL LONG TERM LOANS	50%		37.3	85.5	122.5	143.0	143.0	143.4	99.8
LENDER AA	US \$ millions		14.9	34.2	40.3	57.2	57.2	54.1	50.6
LENDER AB			7.5	17.1	24.4	28.6	28.6	24.7	20.5
LENDER CC			5.6	12.5	18.3	21.4	21.4	16.8	11.7
LENDER DD			5.6	12.5	18.3	21.4	21.4	19.3	17.8
LENDER EE			3.7	8.2	13.2	14.3	14.3	7.5	0.8
INTEREST AND LOAN PRINCIPAL BREAK-DOWN									
INTEREST PAYMENTS ONLY		CURRENCY							
LENDER AA	US \$ millions		1.94	4.45	8.34	7.43	7.43	7.43	6.57
LENDER BB			4.60	1.37	1.82	2.39	2.39	1.90	1.64
LENDER CC			8.86	1.38	1.82	2.14	2.14	1.88	1.17
LENDER DD			8.34	0.77	1.18	1.29	1.29	1.16	1.02
LENDER EE			8.41	0.94	1.34	1.57	1.57	8.83	0.08
TOTAL INTEREST PAID			3.85	8.81	13.57	14.73	14.73	12.67	10.41
TOTAL INTEREST PAID	PESO x 1000 millions		1.84	4.02	6.12	7.40	8.18	7.53	6.69
PRINCIPAL INTEREST									
LENDER AA	US \$ millions		2.75	6.30	8.99	10.51	10.54	10.54	10.51
LENDER BB			1.83	3.70	5.28	6.19	6.19	6.19	6.19
LENDER CC			1.77	4.03	5.77	6.77	6.77	6.77	6.77
LENDER DD			8.90	2.86	2.95	3.45	3.45	3.45	3.45
LENDER EE			2.18	4.99	7.12	8.35	8.35	8.35	0.08
PRINCIPAL REPAYMENTS ONLY									
LENDER AA	US \$ millions		0.81	0.89	0.90	8.88	3.10	3.51	3.96
LENDER BB			0.06	4.88	4.80	0.88	3.90	4.31	4.55
LENDER CC			0.04	0.82	4.80	0.06	4.81	5.08	5.29
LENDER DD			0.08	4.88	4.80	8.08	2.17	2.38	2.43
LENDER EE			4.90	0.00	0.00	0.00	6.78	7.52	0.08
TOTAL PRINCIPAL REPAY	US \$ millions		8.80	0.00	0.00	0.90	21.56	22.62	16.54
TOTAL PRINCIPAL REPAY	PESO x 1000 millions		8.80	0.00	0.00	8.80	11.43	13.42	16.42
TAXATION CALCULATION SCHEDULE									
MONTHLY TAX UNIT		US \$ PER UNIT							
TAX RATE ON NON-MINING INCOME			46.1	47.5	48.9	50.4	51.9	53.5	55.1
ORDINARY COMPANY TAX RATE			8.8%	0.0%	0.0%	0.0%	0.0%	8.8%	0.0%
SECONDARY TAX ON COMPANIES			8.8%	0.0%	0.0%	8.8%	0.0%	8.8%	0.0%
TAXATION RATES:									
SUBSIDIARY			35	35	35	35	35	35	35
BRANCH			0	0	0	0	0	0	0
SURCHARGES			0	0.0	0.0	0.0	0.0	0.0	0.0
ALLOWANCE ON CAPEX TAX %			0.0	0.0	0.0	0.0	0.0	0.0	0.0
CASH/CW INPUTS FOR TAX CALCULATION									
REVENUES			4.0	8.0	8.8	39.8	44.4	54.4	103.8
PRODUCTION COSTS			1.0	1.6	1.3	21.3	23.5	48.5	55.0
TAX RELATED COSTS			8.9	1.3	1.1	1.3	1.0	0.9	8.8
LOAN INTEREST PAYMENTS			0.0	2.8	4.4	4.5	7.3	8.3	7.5
DEPLETION ALLOWANCES			8.8	8.8	8.8	8.8	8.8	0.0	8.8
TOTAL ALLOWABLE COSTS			1.9	4.8	6.7	25.9	41.4	57.5	61.3

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FORECAST OF OPERATIONS	CALENDAR YEARS	1994	1995	1996	1997	1998	1999	2000
CHILE		ALL FINANCIAL AMOUNTS IN: PESO x 1000 millions UNLESS STATED OTHERWISE						
NET ROYALTY PAYMENTS		0.0	0.0	0.0	0.0	0.0	0.0	0.0
DISALLOWED PREVIOUS YEARS TAX LOSSES		0.0	0.0	0.0	0.0	0.0	0.0	0.0
CAPEX/DEPRECIATION (SEE BREAKDOWN BELOW)		7.3	16.8	23.1	26.9	25.1	21.2	15.4
NET ALLOWABLE DEDUCTIONS		7.3	16.8	23.1	26.9	25.1	21.2	15.4
CAPITAL ALLOWANCES AND CARRY FORWARDS (FOR TAX PURPOSES)								
UNRED. BAL. CAPEX (C/F)		0.0	7.3	14.1	47.2	74.1	80.5	64.8
ALLOWANCE ON UNRED. CAPEX		0.0	0.0	0.0	0.0	0.0	0.0	0.0
CURRENT YEAR'S CAPEX		7.3	16.8	23.1	26.9	25.1	21.2	15.4
ALLOWANCE ON CURRENT CAPEX		0.0	0.0	0.0	0.0	0.0	0.0	0.0
UNRED. BAL. CAP ALLOWANCE		0.0	0.0	0.0	0.0	0.0	0.0	0.0
ALL. ON UNRED. BAL. CAP ALLOWANCE		0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL UNRED. CAPEX + ALLOWANCE		7.3	16.8	23.1	26.9	25.1	21.2	15.4
UNRED. BAL. CAPEX (C/F)		7.3	16.8	23.1	26.9	25.1	21.2	15.4
TAX CALCULATION								
UNRECOVERED WORKING LOSSES		-1.9	-6.7	-13.4	-3.3	0.0	0.0	0.0
WORKING PROFIT (LESS ROYALTIES)		0.0	0.0	0.0	0.0	18.7	36.9	40.5
TOTAL CAPITAL DEDUCTION FOR TAX		7.3	16.8	23.1	26.9	25.1	21.2	15.4
TAXABLE INCOME		-7.3	-6.7	-13.4	-3.3	18.7	36.9	40.5
% IN TAX FORMULA (IF SOUTH AFRICA)		0.00	0.00	0.00	0.00	0.00	0.00	0.00
TAX RATE APPLIED		0.00	0.00	0.00	0.00	0.00	0.00	0.00
TAX PAYABLE		0.0	0.0	0.0	0.0	0.0	0.0	0.0
SURCHARGE		0.0	0.0	0.0	0.0	0.0	0.0	0.0
LESS TAX EFFECT OF PROFIT SHARE		0.0	0.0	0.0	0.0	0.0	0.0	0.0
COUNT FOR FIRST TAX PAYMENT	2005	1.0	1.0	1.0	1.0	1.0	1.0	1.0
TOTAL TO GOVERNMENT		0.0	0.0	0.0	0.0	0.0	0.0	0.0
CONDITIONAL TAX CALCULATIONS:								
NET EARNINGS (EXCL. DEPRECIATION)		0.00	0.00	0.00	0.00	21.81	25.25	28.94
INVESTMENT RECOVERY PERIOD		-29.87	-71.01	-104.34	-124.75	-182.94	-77.69	-45.73
TARGET INCOME		0.00	0.00	0.00	0.00	0.00	0.00	0.00
ADDITIONAL PROFITS TAX (APT)		0.00	0.00	0.00	0.00	0.00	0.00	0.00
NET CASHFLOW (EXCLUDING INTEREST & DEPREC)		-29.86	-71.01	-104.34	-124.75	-182.94	-77.69	-45.73
NPV AT 10% + STIPULATED % P.A.		-74.47	-99.79	-146.88	-173.93	-293.36	-99.45	-45.63
ANNUAL LOSS FOR TAX PURPOSES		-7.3	-16.8	-23.1	-26.9	-25.1	-21.2	-15.4
ANNUAL LOSS COUNTER		1	1	1	1	1	0	0
LOSS CARRYFORWARD PERIOD		-7.3	-16.8	-23.1	-26.9	-25.1	-21.2	-15.4
CUMULATIVE COUNTER		1	2	3	4	5	5	5
DEDUCTION FROM ACCUMULATED LOSSES		0.00	0.00	0.00	0.00	0.00	0.00	0.00
DEPLETION ALLOWANCES:								
GOLD & SILVER SALES		0.0	0.0	0.0	0.0	0.0	0.0	0.0
OTHER METAL MINERALS		0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL DEPLETION ALLOWANCE		0.0	0.0	0.0	0.0	0.0	0.0	0.0
CAPITAL EXPENDITURE SCHEDULE								
	PERCENT OF TOTAL IMPORTED 100%							
MINING MACHINERY/PLANT	20.0%	4.0	6.0	4.6	5.7	3.0	2.3	1.6
SMELTING/REFINING PLANT	10.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BUILDINGS, MINESITE PREP.	20.0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SHIPSTEAMERS	9.5%	1.9	3.2	2.2	2.7	1.7	1.0	0.8
PARTING/ON EQUIP.	5.0%	1.0	1.6	1.2	1.5	0.8	0.6	0.4
BUILDINGS/STEEL	3.0%	0.6	0.9	0.7	0.8	0.5	0.4	0.3
BUILDINGS/WOOD, FUEL-PAL.	1.0%	0.2	0.3	0.2	0.2	0.1	0.1	0.1
MAU. SURVEY EQUIP.	1.0%	0.2	0.3	0.2	0.2	0.1	0.1	0.1
COMPUTERS	0.7%	0.1	0.2	0.1	0.1	0.1	0.0	0.0

**COUNTRY CRITERIA
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FORECAST OF OPERATIONS			CALENDAR YEARS						
			1985	1986	1987	1988	1989	1990	1991
CHILE			ALL FINANCIAL AMOUNTS IN:						
			PESO x 1000 millions						
			UNLESS STATED OTHERWISE						
FURNITURE/FITTINGS	0.7%	0.0%	0.15	0.35	0.10	0.21	0.13	0.09	0.04
OTHER OFFICE EQUIP.	0.5%	0.0%	0.12	0.30	0.15	0.17	0.11	0.07	0.03
MOTOR VEHICLES	0.3%	50.0%	0.10	0.16	0.23	0.14	0.09	0.06	0.03
CONCRETE MIXERS	0.3%	0.0%	0.10	0.16	0.12	0.14	0.08	0.04	0.03
ROCKERS/VIBRATORS	0.3%	0.0%	0.10	0.16	0.12	0.14	0.08	0.06	0.03
CRANES	0.5%	100.0%	0.10	0.16	0.22	0.14	0.07	0.05	0.03
AIR-CONDITION PLANT	0.3%	0.0%	0.06	0.09	0.07	0.08	0.05	0.03	0.01
VEHICLE REPAIR EQUIP.	0.3%	0.0%	0.06	0.09	0.07	0.08	0.05	0.03	0.01
PORTABLE SLEEPING UNITS	0.4%	0.0%	0.11	0.18	0.13	0.16	0.10	0.06	0.03
CARPETS	0.3%	0.0%	0.04	0.06	0.04	0.05	0.03	0.02	0.01
POWER TOOLS (HAND)	0.1%	100.0%	0.03	0.05	0.03	0.04	0.03	0.02	0.01
CAPITALIZED OP. EXPENSE			1.00	4.00	2.00	4.00	2.00	1.00	0.70
EXPLORATION EXPENDITURE			7.00	3.00	2.00	1.00	2.00	1.00	1.00
MINERAL CLAIM COSTS (10% OF EXPLOR.)			0.70	0.30	0.20	0.10	0.20	0.10	0.10

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FORECAST OF OPERATIONS		CALENDAR YEARS	1991	1992	1993	1994	1995	1996	1997	1998	1999
CHILE			ALL FINANCIAL AMOUNTS IN: PESO x 1000 millions UNLESS STATED OTHERWISE								
ECONOMIC INPUTS											
INFLATION RATES											
U.S.A.	US \$		3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
INFLATION FACTOR TO:	1995		1.23	1.27	1.30	1.34	1.38	1.43	1.47	1.51	
COUNTRY INFLATION RATE			18.8%	18.8%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	18.8%
INFLATION FACTOR TO:	1995		1.95	2.14	2.24	2.39	2.28	3.14	3.43	3.89	
CURRENCY DEPRECIATION FACTOR			1.58	1.69	1.81	1.93	2.04	2.20	2.35	2.51	
GOLD PRICE	\$/OZ		487	481	486	511	514	543	559	575	
EXCHANGE RATE (PER DOL)	PESO x 1000		9.43	9.48	9.71	9.77	9.81	9.88	9.94	1.00	
OPERATING CASH FLOW COMPONENTS											
	DISTRIBUTION CODE										
GOLD REVENUE			114.28	115.77	128.28	153.11	167.31	184.45	202.45	222.70	
POWER/SERVICES/STONES	OMC1		23.37	23.93	28.65	34.37	34.51	37.94	41.76	45.93	
HUMAN RESOURCE	EMP1		24.38	29.82	31.92	35.11	38.63	42.49	46.73	51.40	
OTHER ON-MINE COSTS	OMC2		6.17	6.79	7.47	8.23	8.84	9.54	10.34	11.03	
TOTAL ON-MINE COSTS			84.12	81.74	87.91	74.70	82.17	94.39	99.43	109.37	
MANAGEMENT FEES	MAN1		1.35	1.49	1.63	1.79	1.97	2.17	2.39	2.63	
CAPITAL EXPENDITURE	OMC3		5.83	6.40	7.04	7.74	8.51	9.37	10.30	11.33	
MANAGEMENT FEES	MAN2		0.28	0.31	0.34	0.37	0.41	0.45	0.49	0.54	
EXPLORATION EXPENDITURE	OMC4		1.45	1.40	1.76	1.94	2.13	2.34	2.58	2.83	
COUNTRY SPECIFIC FACTORS											
PROD. ROYALTY ON COPPER	RO1		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
PROD. ROYALTY ON GOLD	RO2		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
EXPORT ROYALTY	RO3		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
TAX ON ALLUVIAL GOLD	RO4		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
YEAR COUNTER FOR VAT AND IMPORT DUTY HOLIDAY			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
SALES TAXES / VAT	RG5		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
SOCIAL SECURITY CHARGES	EM02		0.31	0.38	0.64	0.70	0.77	0.85	0.93	1.03	
TRAINING EXPENSES	EM03		0.26	0.29	0.32	0.35	0.39	0.41	0.47	0.51	
CUSTOMS DUTIES	RG6		0.16	0.17	0.19	0.21	0.23	0.25	0.28	0.31	
LAND/BUILDING TAXES	RG7		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
DEAD RENT	RG8		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
STAMP DUTIES	RG9		0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.04	
REAL ESTATE TAX	RG10		0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	
CAPITAL TAX	RG11		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
MINING CONCESSION FEES	RG12		0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	
EXCISE TAX: AUTO FUEL	RG13		0.31	0.34	0.37	0.41	0.45	0.49	0.54	0.60	
EXCISE TAX: DIESEL	RG14		0.26	0.40	0.44	0.48	0.53	0.58	0.64	0.70	
ROYALTIES (NON-GOVN)	RGY1		0.00	0.00	1.07	1.37	1.45	1.63	1.85	2.07	
CORPORATE TAX REGIME											
COMPANY TAXATION	RG15		0.00	13.40	15.47	18.49	21.07	23.67	26.51	29.53	
TAX CREDIT FOR INV. REG. PERIOD			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
TAX CREDIT	RG16		0.00	0.31	0.34	0.37	0.41	0.45	0.50	0.55	
ADDITIONAL PROFITS TAX	RG17		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
PROVINCIAL/LOCAL TAXES	RG18		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
LOAN REPAYMENTS	LOAN1		10.48	12.26	9.47	11.08	7.86	9.39	7.76	9.37	
INTEREST ON LOANS	LOAN2		6.88	5.97	5.12	4.50	3.67	3.01	2.15	1.23	

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NEW LIST OF OPERATIONS		CALENDAR YEARS	1982	1983	1984	1985	1986	1987	1988	1989
CHILE			ALL FINANCIAL AMOUNTS IN: PESO x 1000 millions UNLESS STATED OTHERWISE							
INTEREST CHARGE BY LOCAL BANK	LOAN 3		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EMPLOYEES' SHARE OF PROFITS			4.00	4.25	4.69	5.33	11.13	13.39	14.21	19.01
PERCENTAGE OF INCOME			6.59	7.24	7.96	8.98	9.43	10.62	11.68	12.55
MAXIMUM BONUS AMOUNT			3.99	4.28	4.71	5.18	5.70	6.27	6.89	7.58
ACTUAL BONUS PAID	EMP4		0.00	4.25	4.69	5.18	5.71	6.27	6.89	7.58
CASHFLOW EARNINGS (NET)	PROJECT		34.53	16.79	20.13	23.11	30.35	33.21	39.07	43.54
PAYBACK PERIOD COUNTER (IN YEARS)			1.00	1.00	1.00	0.96	0.89	0.80	0.69	0.60
NPV OF INVESTORS' EARNINGS			-17.76	-0.97	-1.44	7.51	16.15	28.73	40.21	51.69
WITHHOLDING TAXES ON:										
DIVIDENDS: SUBSIDIARY	HC19		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DIVIDENDS: DRAMACH										
ROY. (LTC): NON-ASSOC.	HC10		0.00	0.00	0.37	0.45	0.51	0.56	0.65	0.72
ROYALTIES: ASSOCIATE										
LOAN INTEREST	HC21		0.26	0.24	0.28	0.18	0.13	0.12	0.09	0.05
MANAGEMENT FEES (to non-residents)	HC22		0.33	0.36	0.39	0.43	0.46	0.53	0.58	0.63
ROYALTIES TO LANDOWNERS	HC23		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DISTRIBUTION OF FUNDS ANALYSIS										
REVENUE + INITIAL CAPITAL	(INFLOWS)		114.38	124.71	130.28	153.11	167.53	184.05	192.45	232.70
SUMMATION OF DISTRIBUTIONS	(OUTFLOWS)		114.38	124.71	130.28	153.11	167.53	184.05	192.45	232.70
IN LOCAL CURRENCY:		PESO x 1000 - millions								
INVESTORS' EARNINGS (NET OF WH TAX)			34.53	16.79	20.13	23.11	30.35	33.21	39.07	43.54
DEBT: PRINCIPAL INVESTED/REPAID	LOAN1		18.48	13.24	9.47	11.08	7.86	9.31	7.76	9.27
INTEREST ON LOANS (NET OF WH TAX)	LOAN2		6.33	5.73	4.91	4.32	3.53	2.90	2.06	1.17
ROYALTIES (NET OF WH TAX)	ROY		4.00	0.00	0.70	0.83	0.84	1.07	1.30	1.34
MAN. FEES (NET OF WH TAX)	MAN		1.30	1.43	1.67	1.73	1.90	2.10	2.30	2.54
EMPLOYEES' PAYMENTS	EMP		27.17	34.14	39.57	41.34	45.48	54.83	58.93	68.23
OP. COSTS + CAPEX	CMC		37.81	48.73	44.79	49.27	54.18	56.41	65.57	72.13
HOST GOVERNMENT RECEIPTS	HG		1.46	14.72	17.14	20.23	23.86	25.84	28.84	31.08
IN US \$ CURRENCY:		US \$ - millions								
INVESTORS' EARNINGS (NET OF WH TAX)			46.16	24.67	27.83	30.95	26.82	27.72	42.18	43.36
DEBT: PRINCIPAL INVESTED/REPAID	LOAN1		16.54	16.12	13.10	14.35	9.54	10.56	9.25	9.33
INTEREST ON LOANS (NET OF WH TAX)	LOAN2		9.09	8.47	6.79	5.49	4.33	3.29	2.19	1.16
ROYALTIES (NET OF WH TAX)	ROY		0.00	0.00	0.96	1.07	1.14	1.22	1.28	1.31
MAN. FEES (NET OF WH TAX)	MAN		2.05	2.11	2.18	2.24	2.51	2.38	2.45	2.52
EMPLOYEES' PAYMENTS	EMP		41.87	50.44	54.74	57.85	55.16	56.81	58.82	68.23
OP. COSTS + CAPEX	CMC		50.40	64.15	61.56	63.83	68.73	67.70	69.23	71.83
HOST GOVERNMENT RECEIPTS	HG		2.30	21.73	23.73	26.34	27.97	29.34	31.69	31.95
NET PRESENT VALUE CALCULATIONS										
IN LOCAL CURRENCY:		PESO x 1000 - millions								
PROVIDERS OF CAPITAL:										
EQUITY CAPITAL INVESTED										
EQUITY EARNINGS (NET OF WH TAXES)										
LOAN CAPITAL INVESTED	PRINCIPAL									
	INTEREST									
EMPLOYEE AND SERVICES RECEIPTS										
HOST GOVERNMENT RECEIPTS										
IN US \$ CURRENCY:		US \$ - millions								
PROVIDERS OF CAPITAL:										
EQUITY CAPITAL INVESTED										
EQUITY EARNINGS (NET OF WH TAXES)										
LOAN CAPITAL INVESTED	PRINCIPAL									
	INTEREST									
EMPLOYEE AND SERVICES RECEIPTS										
HOST GOVERNMENT RECEIPTS										

**COUNTRY CRITERIA
SIMULATION MODEL**
SIMULATION MODULE

FORECAST OF OPERATIONS		CALENDAR YEARS		2001	2002	2003	2004	2005	2006	2007	2008	2009
CHILE				ALL FINANCIAL AMOUNTS IN: PESO x 1000 millions UNLESS STATED OTHERWISE								
EQUITY AND LOAN FINANCE SCHEDULE												
YEAR END BALANCES												
ANNUAL CAPITAL INJECTIONS	PESO x 1000 millions			0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	US \$ millions			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL CAPITAL INJECTED	US \$ millions			285.9	285.9	285.9	285.9	285.9	285.9	285.9	285.9	285.9
EQUITY CAPITAL	50%			142.9	142.9	142.9	142.9	142.9	142.9	142.9	142.9	142.9
TOTAL LONG TERM LOANS	50%			23.1	65.1	52.8	37.7	28.1	17.6	9.3	0.0	
LENDER AA	US \$ millions			46.4	42.1	37.1	31.3	24.9	17.6	9.3	0.0	
LENDER BB				15.9	11.0	5.7	0.0	0.0	0.0	0.0	0.0	
LENDER CC				6.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
LENDER DD				14.5	12.0	9.2	6.3	3.3	0.0	0.0	0.0	
LENDER EE				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
INTEREST AND LOAN PRINCIPAL BREAK-DOWN												
INTEREST PAYMENTS ONLY				CURRENCY								
LENDER AA	US \$ millions			6.06	5.46	4.83	4.08	3.23	2.39	1.21	0.00	
LENDER BB				1.28	0.88	0.46	0.00	0.00	0.00	0.00	0.00	
LENDER CC				0.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
LENDER DD				0.87	0.72	0.53	0.38	0.20	0.01	0.00	0.00	
LENDER EE				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
TOTAL INTEREST PAID				8.83	7.06	5.82	4.46	3.43	2.39	1.21	0.00	
TOTAL INTEREST PAID	PESO x 1000 millions			5.97	5.15	4.50	3.07	3.02	2.15	1.22	0.00	
PRINCIPAL INTEREST												
LENDER AA	US \$ millions			10.64	10.54	10.54	10.64	10.54	10.54	10.54	0.00	
LENDER BB				4.19	4.19	4.19	0.00	0.00	0.00	0.00	0.00	
LENDER CC				6.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
LENDER DD				3.45	3.45	3.45	3.45	3.45	0.00	0.00	0.00	
LENDER EE				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
PRINCIPAL REPAYMENTS ONLY												
LENDER AA	US \$ millions			4.40	5.06	5.72	6.44	7.20	8.35	9.33	0.00	
LENDER BB				4.91	5.30	5.73	6.00	6.00	6.00	6.00	0.00	
LENDER CC				6.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
LENDER DD				2.50	2.74	2.90	3.07	3.26	3.00	0.00	0.00	
LENDER EE				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
TOTAL PRINCIPAL PAID	US \$ millions			18.12	13.10	14.35	9.54	10.56	8.35	8.33	0.00	
TOTAL PRINCIPAL PAID	PESO x 1000 millions			12.36	9.47	11.08	7.86	9.20	7.76	5.57	0.00	
TAXATION CALCULATION SCHEDULE				2001	2002	2003	2004	2005	2006	2007	2008	2009
MONTHLY TAX UNIT	US \$ PER UNIT			56.7	58.4	60.3	63.0	63.9	65.6	67.0	69.8	
TAX RATE ON NON-MINING INCOME				0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
ORDINARY COMPANY TAX RATE				0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
SECONDARY TAX ON COMPANIES				0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
TAXATION RATES:												
SUBSIDIARY				35	35	35	35	35	35	35	35	
BRANCH				0	0	0	0	0	0	0	0	
EXCHARGES				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
ALLOWANCE ON SALES TAX %				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
CASH FLOW INCOME FOR TAX CALCULATION												
REVENUES				114.3	124.7	136.3	151.1	167.3	184.0	201.5	222.7	
PRODUCTION COSTS				36.3	64.1	70.5	77.6	85.3	93.9	103.2	113.6	
TAX RELATED COSTS				0.9	0.9	1.0	1.1	1.2	1.4	1.5	1.7	
LOAN INTEREST PAYMENTS				4.6	6.0	5.1	4.5	3.7	3.0	2.1	1.2	
DEPLETION ALLOWANCES				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
TOTAL ALLOWABLE COSTS				67.7	71.0	76.7	83.2	90.2	98.3	106.9	116.4	

**COUNTRY CRITERIA
SIMULATION MODEL**
SIMULATION MODULE

FORECAST OF OPERATIONS		CALENDAR YEARS		1982	1983	1984	1985	1986	1987	1988	1989
CHILE		ALL FINANCIAL AMOUNTS IN: PESOS x 1000 millions UNLESS STATED OTHERWISE									
NET ROYALTY PAYMENTS			0.0	0.0	1.1	1.3	1.5	1.6	1.6	1.6	2.1
DISALLOWED PREVIOUS YEARS TAX LOSSES			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CAPEX DEPRECIATION (SEE BREAKDOWN BELOW)			12.5	10.5	9.8	9.6	9.7	10.3	11.1	11.1	12.3
NET ALLOWABLE DEDUCTIONS			12.5	10.5	9.8	9.6	9.7	10.3	11.1	11.1	12.3
CAPITAL ALLOWANCES AND CARRY FORWARDS (FOR TAX PURPOSES)											
UNREQ. BAL. CAPEX (B/E)			37.5	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ALLOWANCE ON UNREQ. CAPEX			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CURRENT YEARS CAPEX			12.5	10.5	9.8	9.6	9.7	10.3	11.1	11.1	12.3
ALLOWANCE ON CURRENT CAPEX			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
UNREQ. BAL. CAP. ALLOWANCE			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ALL ON UNREQ. BAL. CAP. ALLOWANCE			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL UNREQ. CAPEX + ALLOWANCE			1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
UNREQ. BAL. CAPEX (C/V)			1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TAX CALCULATION											
UNRECOVERED WORKING LOSSES			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WORKING PROFIT (LESS ROYALTIES)			48.6	54.7	44.5	47.4	75.6	84.3	83.7	104.2	104.2
TOTAL CAPITAL DEDUCTION FOR TAX			50.0	11.9	9.8	9.6	9.7	10.3	11.1	11.1	12.3
TAXABLE INCOME			-1.5	42.7	34.7	37.8	65.9	73.9	72.6	93.1	91.9
20% IN TAX FORMULA (OF SOUTH AFRICA)			0.00	34.02	34.01	30.14	39.38	48.15	48.82	41.30	41.30
TAX RATE APPLIED			0.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00
TAX PAYABLE			0.0	15.0	17.8	20.3	33.1	25.9	26.9	32.3	32.3
SURCHARGE			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LESS TAX EFFECT OF PROFIT SHARE			0.0	1.5	2.3	1.8	2.0	2.2	2.4	2.4	2.7
COUNT FOR FIRST TAX PAYMENT		1983	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL TO GOVERNMENT			0.0	1.5	15.5	18.5	31.1	23.7	26.5	29.5	29.5
CONDITIONAL TAX CALCULATIONS											
NET EARNINGS (EXCL. DEPRECIATION)			37.80	14.70	28.91	37.80	41.00	44.92	35.54	57.71	57.71
INVESTMENT RECOVERY PERIOD			-18.35	13.74	42.06	75.54	116.54	161.43	214.04	279.71	279.71
TARGET INCOME			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ADDITIONAL PROFIT TAX (APT)			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NET CASHFLOW (EXCLUDING INTEREST & DEPREC.)			-47.89	39.19	11.09	43.96	47.59	51.50	56.47	61.71	61.71
NPV AT 10% FRIE + STIPULATED % P.A.			-30.88	-32.33	-16.47	-11.73	-17.33	-13.48	-9.36	-6.83	-6.83
ANNUAL LOSS FOR TAX PURPOSES			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ANNUAL LOSS COUNTER			0	0	0	0	0	0	0	0	0
LOSS CARRYFORWARD PERIOD			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CUMULATIVE COUNTER			2	3	3	3	3	3	3	3	3
DEDUCTION FROM ACCUMULATED LOSSES			0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DEPLETION ALLOWANCES											
GOLD & SILVER SALES			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OTHER METALS/MINERALS			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL DEPLETION ALLOWANCE			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CAPITAL EXPENDITURE SCHEDULE											
		PERCENT PERCENT OF TOTAL IMPORTED									
		100%									
MINING MACHINERY/PLANT		10.0%	1.16	1.28	1.41	1.35	1.70	1.87	1.06	2.27	2.27
SMELTING/REFINING PLANT		20.0%	1.16	1.28	1.41	1.35	1.70	1.87	2.06	2.37	2.37
BUILDINGS, DOMESTIC PROP.		20.0%	1.14	1.28	1.41	1.35	1.70	1.87	2.06	2.27	2.27
SHIP/STEAMERS		9.5%	0.35	0.61	0.67	0.74	0.81	0.89	0.96	1.06	1.06
EARTHMOVING EQUIP.		5.0%	0.29	0.33	0.35	0.39	0.43	0.47	0.53	0.57	0.57
BUILDINGS/STEEL		3.0%	0.17	0.19	0.21	0.23	0.26	0.28	0.31	0.34	0.34
BUILDINGS/WOOD, PRE-FAB.		1.0%	0.06	0.06	0.07	0.08	0.09	0.09	0.10	0.11	0.11
NAT. SURVEY EQUIP.		1.0%	0.06	0.06	0.07	0.08	0.09	0.09	0.10	0.11	0.11
COMPUTERS		0.7%	0.04	0.05	0.05	0.05	0.06	0.07	0.08	0.08	0.08

**COUNTRY CRITERIA
SIMULATION MODEL**
SIMULATION MODULE

FORECAST OF OPERATIONS		CALENDAR YEARS	2001	2002	2003	2004	2005	2006	2007	2008	2009
CHILE			ALL FINANCIAL AMOUNTS IN: PESO x 1000 millions UNLESS STATED OTHERWISE								
FURNITURE/FITTINGS	0.7%	0.1%	0.01	0.05	0.03	0.06	0.05	0.05	0.07	0.08	0.05
OTHER OFFICE EQUIP.	0.0%	0.0%	0.03	0.04	0.04	0.05	0.05	0.06	0.06	0.06	0.07
MOTOR VEHICLES	0.3%	32.0%	0.03	0.03	0.04	0.04	0.04	0.04	0.05	0.05	0.05
CONCRETE MIXERS	0.5%	0.1%	0.03	0.03	0.04	0.04	0.04	0.05	0.05	0.05	0.05
IMMERSION VIBRATORS	0.5%	0.1%	0.03	0.03	0.04	0.04	0.04	0.04	0.05	0.05	0.04
CRANES	0.5%	100.0%	0.03	0.03	0.04	0.04	0.04	0.05	0.05	0.05	0.05
AIR-CONDITION PLANT	0.3%	0.0%	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
VEHICLE REPAIR EQUIP.	0.3%	0.0%	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
PORTABLE SLEEPING UNITS	0.6%	0.0%	0.03	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05
CARPETS	0.3%	0.0%	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02
POWER TOOLS (HAND)	0.1%	100.0%	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02
CAPITALIZED OP. EXPENSES	15.0%	0.0%	0.57	0.94	1.06	1.16	1.28	1.38	1.40	1.55	1.70
EXPLORATION EXPENDITURE	100.0%	20.0%	1.45	1.50	1.75	1.94	2.13	2.34	2.58	2.78	2.83
MINERAL CLAIMS COSTS (10% OF EXPLOR.)			0.15	0.09	0.20	0.20	0.20	0.09	0.09	0.09	0.09

**COUNTRY CRITERIA
SIMULATION MODEL**
SIMULATION MODULE

FORECAST OF OPERATIONS		CALENDAR YEAR	2010	2011	2012	2013	2014	2015	LIFE OF PROJECT TOTALS (1995 MONEY)
CHILE			ALL FINANCIAL AMOUNTS IN: PESO x 1000 millions UNLESS STATED OTHERWISE						
ECONOMIC INPUTS									
INFLA. RATE	US \$		3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
INFLATION FACTOR TO:	1995		1.36	1.68	1.65	1.79	1.73	1.81	
COUNTRY INFLATION RATE			10.1%	10.0%	10.0%	10.0%	10.0%	10.0%	10.1%
INFLATION FACTOR TO:	1995		4.19	4.39	5.05	5.56	6.11	6.73	
CURRENCY DEPRECIATION FACTOR			2.08	2.64	3.06	3.27	3.40	3.73	
GOLD PRICE	(\$/OZ)		501	610	628	647	666	686	580.4
EXCHANGE RATE (PER US\$)	PESO x 1000		1.07	1.15	1.32	1.31	1.40	1.49	0.40
OPERATING CASH FLOW COMPONENTS									
	DISTRIBUTION CODES								
GOLD REVENUE			244.97	269.46	306.41	244.64	179.33	197.81	951.43
POWER SERVICES/STORES	OMC1		38.53	35.39	41.14	30.44	26.99	33.33	191.33
HUMAN RESOURCES	EMP1		26.54	23.30	25.42	25.44	41.39	26.43	215.32
OTHER ON-MINE COSTS	OMC2		13.23	14.36	16.81	13.21	9.66	8.83	58.97
TOTAL ON-MINE COSTS			57.30	53.04	63.37	59.09	78.07	77.59	457.92
MANAGEMENT FEES	MAN1		2.89	3.18	3.49	3.28	3.11	1.84	18.99
CAPITAL EXPENDITURE	OMC3		12.47	13.71	15.08	12.44	9.13	8.83	101.45
MANAGEMENT FEES	MAN2		0.68	0.66	0.73	0.60	0.44	0.39	7.37
EXPLORATION EXPENDITURE	OMC4		3.12	3.43	3.77	3.11	2.28	2.01	26.66
COUNTRY-SPECIFIC FACTORS									
PROD. ROYALTY ON COPPER	HO1		0.00	0.00	0.00	0.00	0.00	0.00	0.00
PROD. ROYALTY ON GOLD	HO2		0.00	0.00	0.00	0.00	0.00	0.00	0.00
EXPORT ROYALTY	HO3		0.00	0.00	0.00	0.00	0.00	0.00	0.00
TAX ON ALLUVIAL GOLD	HO4		0.00	0.00	0.00	0.00	0.00	0.00	0.00
YEAR COUNTER FOR VAT AND REPORT DUTY HOLIDAY			0.00	0.00	0.00	0.00	0.00	0.00	
SALES TAXES / VAT	HC5		0.00	0.00	0.00	0.00	0.00	0.00	0.00
SOCIAL SECURITY CHARGES	EMP3		1.13	1.24	1.37	1.13	0.83	0.73	6.30
TRAINING EXPENSES	EMP5		0.57	0.62	0.68	0.56	0.41	0.36	3.15
CUSTOMS DUTIES	HC6		0.34	0.37	0.41	0.24	0.25	0.23	4.08
LAND/BUILDING TAXES	HC7		0.00	0.00	0.00	0.00	0.00	0.00	0.01
DEAD RENT	HC8		0.00	0.00	0.00	0.00	0.00	0.00	0.00
STAMP DUTIES	HC9		0.04	0.05	0.05	0.06	0.06	0.07	0.21
REAL ESTATE TAX	HC10		0.03	0.04	0.04	0.04	0.05	0.05	0.17
CAPITAL TAX	HC11		0.00	0.00	0.00	0.00	0.00	0.00	0.00
TUNING CONCESSION FEES	HC12		0.02	0.02	0.02	0.03	0.03	0.03	0.10
EXCISE TAX: AUTO FUEL	HC13		0.66	0.72	0.79	0.67	0.54	1.06	3.29
EXCISE TAX: DIESEL	HC14		0.77	0.85	0.93	1.03	1.13	1.24	3.88
ROYALTIES (NON-GOVN.)	HOV1		2.30	2.36	2.81	3.07	2.39	1.37	5.90
CORPORATE TAX REGIME									
COMPANY TAXATION	HC15		22.91	26.11	39.46	30.56	18.36	14.69	2003
TAX CREDIT FOR INV. REC. PERIOD			0.00	0.00	0.00	0.00	0.00	0.00	0.00
TAX CREDITS	HC16		0.40	0.66	0.73	0.61	0.47	0.43	1.69
ADDITIONAL PROFIT TAX	HC17		0.00	0.00	0.00	0.00	0.00	0.00	0.00
PROVINCIAL/LOCAL TAXES	HC18		0.00	0.00	0.00	0.00	0.00	0.00	0.00
LOAN REPAYMENTS	LOAN1		0.00	0.00	0.00	0.00	0.00	0.00	44.48
INTEREST ON LOANS	LOAN2		0.00	0.00	0.00	0.00	0.00	0.00	37.34

**COUNTRY CRITERIA
SIMULATION MODEL**
SIMULATION MODULE

FORECAST OF OPERATIONS		CALENDAR YEARS	2010	2011	2012	2013	2014	2015	LIFE OF PROJECT TOTALS (1995 MONEY)
CHILE			ALL FINANCIAL AMOUNTS IN: PESO x 1000 millions UNLESS STATED OTHERWISE						
INITIAL CHARGE BY LOCAL BANK	LOAN 3		0.00	0.00	0.00	0.00	0.00	0.00	1.03
EMPLOYEES' SHARE OF PROFITS			23.13	25.13	28.39	29.13	10.33	5.63	
PERCENTAGE OF INCOME			14.14	15.55	17.10	14.11	10.35	9.11	
MAXIMUM BONUS AMOUNT			8.34	9.18	10.00	8.33	6.11	5.37	
ACTUAL BONDS PAID	IS 74		5.34	9.18	10.00	8.33	10.23	5.62	24.00
CASHFLOW EARNINGS (NET)	PRO CT		59.09	65.06	71.81	60.00	43.07	42.90	63.34
PAYBACK (ERCO COUNTER (IN YEARS)			0.00	0.00	0.00	0.00	0.00	0.00	6.85
NPV OF INVESTORS' EARNINGS			65.65	79.99	94.20	104.99	112.00	118.41	-4.00
									63.34
WITH-HOLDING TAXES ON:									
DIVIDENDS (SUBSIDIARY)	HC19		0.00	0.00	4.00	4.00	0.00	0.00	0.00
DIVIDENDS (BRANCH)									
ROYALTIES (NON-ASSOC.)	HC20		0.00	0.00	0.00	1.00	0.04	0.55	2.05
ROYALTIES (ASSOCIATE)									
LOAN INTEREST	HC21		0.00	0.00	0.00	0.00	0.00	0.00	1.40
MANAGEMENT FEES	HC22		0.70	0.77	0.84	0.70	0.51	0.45	3.85
(to non-residents)									
ROYALTIES TO LANDOWNERS	HC13		0.00	0.00	0.00	0.00	0.00	0.00	0.00
DISTRIBUTION OF FUNDS ANALYSIS									
REVENUE + INITIAL CAPITAL (INFLOWS)			244.97	269.46	296.41	244.54	179.33	157.81	1042.30
SUMMATION OF DISTRIBUTIONS (OUTFLOWS)			244.97	269.46	296.41	244.54	179.33	157.81	1042.30
IN LOCAL CURRENCY PESO x 1000 millions									
INVESTORS' EARNINGS (NET OF WH TAX)			59.09	65.06	71.81	60.00	43.07	42.90	-55.07
DEBT: PRINCIPAL INVESTED/REPAID	LOAN1		0.00	0.00	0.00	0.00	0.00	0.00	-55.07
INTEREST ON LOANS (NET OF WH TAX)	LOAN2		0.00	0.00	0.00	0.00	0.00	0.00	80.24
ROYALTIES (NET OF WH TAX)	ROY		1.49	1.66	1.83	1.00	1.55	1.02	3.33
MAN. FEES (NET OF WH TAX)	MAN		3.79	3.07	3.37	2.78	2.04	1.00	14.81
EMPLOYEES' PAYMENTS	EMP		66.58	73.24	80.56	66.47	52.06	43.14	246.01
OP. COSTS+CAPEX	OMC		79.34	87.20	94.81	79.21	58.08	51.11	421.01
HOST GOVERNMENT RECEIPTS	HG		35.07	39.10	43.83	34.09	24.70	17.84	108.02
IN U.S. CURRENCY US \$ millions									
INVESTORS' EARNINGS (NET OF WH TAX)			35.10	36.88	39.78	45.00	30.87	28.79	-137.69
DEBT: PRINCIPAL INVESTED/REPAID	LOAN1		0.00	0.00	0.00	0.00	0.00	0.00	-137.69
INTEREST ON LOANS (NET OF WH TAX)	LOAN2		0.00	0.00	0.00	0.00	0.00	0.00	208.01
ROYALTIES (NET OF WH TAX)	ROY		1.39	1.45	1.49	1.53	1.11	0.88	5.55
MAN. FEES (NET OF WH TAX)	MAN		2.69	2.08	2.76	2.13	1.44	1.21	36.53
EMPLOYEES' PAYMENTS	EMP		42.08	43.94	45.84	38.88	37.39	28.95	616.31
OP. COSTS+CAPEX	OMC		73.98	76.18	78.49	60.63	41.67	34.31	1857.53
HOST GOVERNMENT RECEIPTS	HG		33.24	34.19	35.03	26.09	18.87	11.98	207.39
NET PRESENT VALUE CALCULATIONS									
IN LOCAL CURRENCY PESO x 1000 millions									
PROVIDERS OF CAPITAL									
EQUITY CAPITAL INVESTED									
EQUITY EARNINGS (NET OF WH TAXES)									
LOAN CAPITAL INVESTED	PRINCIPAL								
	INTEREST								
EMPLOYEE AND SERVICES RECEIPTS									
HOST GOVERNMENT RECEIPTS									
IN U.S. CURRENCY US \$ millions									
PROVIDERS OF CAPITAL									
EQUITY CAPITAL INVESTED									
EQUITY EARNINGS (NET OF WH TAXES)									
LOAN CAPITAL INVESTED	PRINCIPAL								
	INTEREST								
EMPLOYEE AND SERVICES RECEIPTS									
HOST GOVERNMENT RECEIPTS									
DISCOUNT RATES									
NPV CALCS. IN US DOLLARS									
SHAREHOLDERS									
EARNINGS									
LOANS VALUES									
IRR VALUE									

**COUNTRY CRITERIA
SIMULATION MODEL**
SIMULATION MODULE

FORECAST OF OPERATIONS		CALENDAR YEARS	2010	2011	2012	2013	2014	2015	LIFE OF PROJECT TOTALS (1995 MONEY)
CHILE		ALL FINANCIAL AMOUNTS IN: PESO x 1000 millions UNLESS STATED OTHERWISE							
EQUITY AND LOAN FINANCE SCHEDULE									
YEAR END BALANCES									
ANNUAL CAPITAL INJECTION:	PESO x 1000 millions	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	US \$ millions	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
TOTAL CAPITAL INJECTED	US \$ millions	285.9	285.9	285.9	285.9	285.9	285.9	285.9	
EQUITY CAPITAL	50%	142.9	142.9	142.9	142.9	142.9	142.9	142.9	
TOTAL LONG TERM LOANS	50%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
LENDER AA	US \$ millions	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
LENDER BB		0.0	0.0	0.0	0.0	0.0	0.0	0.0	
LENDER CC		0.0	0.0	0.0	0.0	0.0	0.0	0.0	
LENDER DD		0.0	0.0	0.0	0.0	0.0	0.0	0.0	
LENDER EE		0.0	0.0	0.0	0.0	0.0	0.0	0.0	
INTEREST AND LOAN PRINCIPAL BREAK-DOWN									
INTEREST PAYMENTS ONLY		CURRENCY							
LENDER AA	US \$ millions	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
LENDER BB		0.00	0.00	0.00	0.00	0.00	0.00	0.00	
LENDER CC		0.00	0.00	0.00	0.00	0.00	0.00	0.00	
LENDER DD		0.00	0.00	0.00	0.00	0.00	0.00	0.00	
LENDER EE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	
TOTAL INTEREST PAID		0.00	0.00	0.00	0.00	0.00	0.00	0.00	
TOTAL INTEREST PAID	PESO x 1000 millions	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
PRINCIPAL INTEREST									
LENDER AA	US \$ millions	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
LENDER BB		0.00	0.00	0.00	0.00	0.00	0.00	0.00	
LENDER CC		0.00	0.00	0.00	0.00	0.00	0.00	0.00	
LENDER DD		0.00	0.00	0.00	0.00	0.00	0.00	0.00	
LENDER EE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	
PRINCIPAL REPAYMENTS ONLY									
LENDER AA	US \$ millions	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
LENDER BB		0.00	0.00	0.00	0.00	0.00	0.00	0.00	
LENDER CC		0.00	0.00	0.00	0.00	0.00	0.00	0.00	
LENDER DD		0.00	0.00	0.00	0.00	0.00	0.00	0.00	
LENDER EE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	
TOTAL PRINCIPAL REPAY	US \$ millions	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
TOTAL PRINCIPAL REPAY	PESO x 1000 millions	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
TAXATION CALCULATION SCHEDULE		2010	2011	2012	2013	2014	2015		
MONTHLY TAX UNIT	US \$ PER UNIT	71.9	74.9	76.3	78.5	80.9	83.3		
TAX RATE ON NON-MINING INCOME		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		
ORDINARY COMPANY TAX RATE		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		
SECONDARY TAX ON COMPANIES		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		
TAXATION RATES:									
SUBSIDIARY		35	35	35	35	35	35		
BRANCH		0	0	0	0	0	0		
SURCHARGES		0.0	0.0	0.0	0.0	0.0	0.0		
ALLOWANCE ON CAPITAL TAX %		0.0	0.0	0.0	0.0	0.0	0.0		
CASHFLOW INPUTS FOR TAX CALCULATION:									
REVENUES		245.0	269.5	294.4	344.5	379.3	407.8		
PRODUCTION COSTS		134.9	137.4	151.3	164.7	179.3	180.5		
TAX RELATED COSTS		1.8	2.0	2.3	2.3	2.4	2.6		
LOAN INTEREST PAYMENTS		0.0	0.0	0.0	0.0	0.0	0.0		
DEPLETION ALLOWANCES		0.0	0.0	0.0	0.0	0.0	0.0		
TOTAL ALLOWABLE COSTS		136.7	139.4	153.4	167.0	181.7	183.1		

**COUNTRY CRITERIA
SIMULATION MODEL**
SIMULATION MODULE

FORECAST OF OPERATIONS	CALENDAR YEAR	2010	2011	2012	2013	2014	2015	LIFE OF PROJECT TOTALS (1995 MONED)
CHILE		ALL FINANCIAL AMOUNTS IN: PESO x 1/980 millions UNLESS STATED OTHERWISE						
NET ROYALTY PAYMENTS		2.3	2.6	2.5	3.1	2.4	1.6	
DEALLOWED PREVIOUS YEARS TAX LOSSES		0.0	0.0	0.0	0.0	0.0	0.0	
CAPEX/DEPRECIATION (SEE BREAKDOWN BELOW)		13.6	15.1	17.3	18.8	18.4	25.3	
NET ALLOWABLE DEDUCTIONS		13.6	15.1	17.3	18.8	18.4	25.3	
CAPITAL ALLOWANCES AND CARRY FORWARDS (FOR TAX PURPOSES)								
UNRED. BAL. CAPEX (M)		0.0	0.0	0.0	0.0	0.0	0.0	
ALLOWANCE ON UNRED. CAPEX		0.0	0.0	0.0	0.0	0.0	0.0	
CURRENT YEAR'S CAPEX		13.6	15.1	17.3	18.8	18.4	25.3	
ALLOWANCE ON CURRENT CAPEX		0.0	0.0	0.0	0.0	0.0	0.0	
UNRED. BAL. CAP ALLOWANCE		0.0	0.0	0.0	0.0	0.0	0.0	
ALL. ON UNRED. BAL. CAP ALLOWANCE		0.0	0.0	0.0	0.0	0.0	0.0	
TOTAL UNRED. CAPEX + ALLOWANCE		0.0	0.0	0.0	0.0	0.0	0.0	
UNRED. BAL. CAPEX (M)		0.0	0.0	0.0	0.0	0.0	0.0	
TAX CALCULATION								
UNRECOVERED WORKING LOSSES		0.0	0.0	0.0	0.0	0.0	0.0	
WORKING PROFIT (LESS ROYALTIES)		118.9	177.3	140.2	114.4	83.1	73.3	
TOTAL CAPITAL DEDUCTION FOR TAX		13.6	15.1	17.3	18.8	18.4	25.3	
TAXABLE INCOME		105.3	162.2	122.9	95.6	64.7	48.0	1009.34
% IN TAX FORMULA (OF SOUTH AFRICA)		41.79	41.79	41.46	39.12	34.96	38.99	35.04%
TAX RATE APPLIED		35.00	35.00	35.00	35.00	35.00	35.00	35.04%
TAX PAYABLE		37.3	57.3	43.0	33.5	22.9	16.6	353.28
SURCHARGE		0.0	0.0	0.0	0.0	0.0	0.0	
LESS TAX EFFECT OF PROFIT SHARE		2.9	3.2	3.5	2.9	3.4	2.0	
COUNT FOR FIRST TAX PAYMENT	2003	0.0	0.0	0.0	0.0	0.0	0.0	
TOTAL TO GOVERNMENT		37.3	60.5	46.5	36.4	26.3	18.6	
CONDITIONAL TAX CALCULATIONS								
NET EARNINGS (EXCL. DEPRECIATION)		74.67	82.30	59.46	75.56	54.48	52.94	
INVESTMENT RECOVERY PERIOD		345.38	428.58	519.24	594.60	649.27	782.21	
TARGET INCOME		0.00	0.00	0.00	0.00	0.00	0.00	
ADDITIONAL PROFITS TAX (APT)		0.00	0.00	0.00	0.00	0.00	0.00	
NET CASHFLOW (EXCLUDING INTEREST & DEPRECIATION)		67.43	74.23	51.96	68.33	53.30	48.52	
NPV AT 10% DISCOUNT RATE		-4.03	-1.51	0.78	2.34	3.34	4.08	
ANNUAL LOSS FOR TAX PURPOSES		0.0	0.0	0.0	-37.2	-33.0	-15.4	
ANNUAL LOSS COUNTER		1	0	0	1	1	1	
LOSS CARRYFORWARD PERIOD		0.00	0.00	0.00	-37.25	-33.07	-15.36	
CUMULATIVE COUNTER		5	5	5	6	7	8	
REDUCTION FROM ACCUMULATED LOSSES		0.00	0.00	0.00	0.00	0.00	0.00	
DEPLETION ALLOWANCES								
GOLD & SILVER SALES		0.0	0.0	0.0	0.0	0.0	0.0	
OTHER METALS/MINERALS		0.0	0.0	0.0	0.0	0.0	0.0	
TOTAL DEPLETION ALLOWANCE		0.0	0.0	0.0	0.0	0.0	0.0	
CAPITAL EXPENDITURE SCHEDULE								
	PERCENT OF TOTAL REPORTED							PROJECT TOTALS
MINING MACHINERY/PLANT	20.0%	24.0%	2.40	2.74	3.02	2.40	1.83	35.32
SMELTING/REFINING PLANT	20.0%	38.0%	2.40	2.74	3.02	2.40	1.83	35.32
BUILDINGS, MINESITE PREP.	10.0%	0.1%	2.40	2.74	3.02	2.40	1.83	35.32
SHIPSTYACKERS	9.0%	100.0%	1.80	1.80	1.80	1.80	1.80	26.37
EARTHMOVING EQUIP.	5.0%	75.0%	0.60	0.60	0.75	0.60	0.60	13.88
BUILDINGS/STEEL	3.0%	0.0%	0.30	0.30	0.45	0.30	0.30	3.33
BUILDINGS/WOOD, PRE-FAB.	1.0%	0.0%	0.10	0.10	0.15	0.10	0.10	2.78
MAG. SURVEY EQUIP.	1.0%	100.0%	0.10	0.10	0.15	0.10	0.10	2.70
COMPUTERS	0.7%	50.0%	0.07	0.10	0.11	0.07	0.06	2.08

**COUNTRY CRITERIA
SIMULATION MODEL**
SIMULATION MODULE

FORECAST OF OPERATIONS			CALENDAR YEARS		2010	2011	2012	2013	2014	2015	LIFE OF PROJECT TOTALS (1995 DOLLAR MONEY)
CHILE			ALL FINANCIAL AMOUNTS IN: PESO x 1000 millions UNLESS STATED OTHERWISE								
FURNITURE/FITTINGS	0.7%	4.0%	0.09	0.10	0.11	0.09	0.07	0.06	0.06	1.00	
OTHER OFFICE EQUIP.	0.6%	5.0%	0.07	0.08	0.09	0.07	0.05	0.05	0.05	1.07	
MOTOR VEHICLES	0.3%	50.0%	0.06	0.07	0.08	0.06	0.05	0.04	0.04	1.30	
CONCRETE MIXERS	0.5%	1.0%	0.06	0.07	0.08	0.06	0.05	0.05	0.04	1.30	
IMPRESSION VIBRATORS	0.5%	0.0%	0.06	0.07	0.08	0.06	0.05	0.05	0.04	1.30	
CRANES	0.5%	100.0%	0.06	0.07	0.08	0.06	0.05	0.05	0.04	1.30	
AIR-CONDITION PLANT	0.3%	1.0%	0.03	0.04	0.04	0.03	0.03	0.03	0.03	0.77	
VEHICLE REPAIR EQUIP.	0.3%	1.0%	0.03	0.04	0.04	0.03	0.03	0.03	0.03	0.77	
PORTABLE SLEEPING UNITS	0.4%	0.0%	0.07	0.08	0.09	0.07	0.05	0.05	0.04	1.54	
CARPETS	0.3%	0.0%	0.03	0.04	0.04	0.03	0.03	0.03	0.03	0.77	
POWER TOOLS (HAND)	0.1%	100.0%	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.29	
CAPITALIZED OP. EXPENSES	15.6%	4.0%	1.07	1.06	1.16	1.07	1.37	1.37	1.20	41.64	
EXPLORATION EXPENDITURE	100.0%	10.0%	3.12	3.43	3.77	3.31	2.28	2.01		33.90	
MINERAL CLAIMS COSTS (10% OF EXPLOR.)			0.00	0.00	0.00	0.19	0.40	0.00		0.80	

COUNTRY CRITERIA SIMULATION MODEL	DISTRIBUTION OF CASH FLOW BY PARTICIPANT											
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
CALENDAR YEARS												
ALL AMOUNTS IN US\$ MILLIONS (MONEY-OF-THE-DAY)												
REVENUES GENERATED												
CHILE	0.0	0.0	0.0	80.1	123.8	170.0	175.1	180.3	185.7	191.3	197.0	202.9
INDONESIA	0.0	0.0	0.0	80.1	123.8	170.0	175.1	180.3	185.7	191.3	197.0	202.9
PNG	0.0	0.0	0.0	80.1	123.8	170.0	175.1	180.3	185.7	191.3	197.0	202.9
RSA	0.0	0.0	0.0	80.1	123.8	170.0	175.1	180.3	185.7	191.3	197.0	202.9
ZIMBABWE	0.0	0.0	0.0	80.1	123.8	170.0	175.1	180.3	185.7	191.3	197.0	202.9
DISTRIBUTED AS FOLLOWS (NEGATIVE AMOUNTS REFLECT CAPITAL INVESTED)												
EMPLOYEE PAYMENTS												
CHILE	0.0	0.0	0.0	19.0	29.4	40.4	41.6	42.9	50.4	54.7	53.6	55.2
INDONESIA	0.0	0.0	0.0	19.2	29.7	40.8	42.0	43.3	44.6	45.9	47.3	48.7
PNG	0.0	0.0	0.0	20.2	31.1	42.8	44.0	45.4	46.7	48.1	49.6	51.1
RSA	0.0	0.0	0.0	20.8	32.1	44.1	45.4	46.8	48.2	49.6	51.1	52.6
ZIMBABWE	0.0	0.0	0.0	20.5	31.7	43.5	44.9	46.2	47.6	49.0	50.5	52.0
MAN. & ADMIN. (#)												
CHILE	1.9	3.0	2.0	3.0	2.5	2.4	2.0	2.1	2.1	2.2	2.2	2.3
INDONESIA	1.9	3.0	2.0	3.0	2.5	2.4	2.0	2.1	2.1	2.2	2.2	2.3
PNG	2.8	3.1	2.1	3.1	2.6	2.5	2.1	2.1	2.2	2.3	2.3	2.4
RSA	1.7	2.6	1.8	2.6	2.2	2.1	1.7	1.8	1.8	1.9	2.0	2.0
ZIMBABWE	1.9	3.0	2.0	3.0	2.5	2.4	2.0	2.1	2.1	2.2	2.2	2.3
OTHER COSTS + CAPEX												
CHILE	70.0	85.0	58.3	83.3	71.0	66.6	56.7	58.4	60.2	62.0	63.8	65.7
INDONESIA	70.0	85.0	58.3	83.3	71.0	66.6	56.7	58.4	60.2	62.0	63.8	65.7
PNG	70.0	85.0	58.3	83.3	71.0	66.6	56.7	58.4	60.2	62.0	63.8	65.7
RSA	70.0	85.0	58.3	83.3	71.0	66.6	56.7	58.4	60.2	62.0	63.8	65.7
ZIMBABWE	70.0	85.0	58.3	83.3	71.0	66.6	56.7	58.4	60.2	62.0	63.8	65.7
ROYALTIES (#)												
CHILE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.1	1.1
INDONESIA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.2	1.3
PNG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.0	1.0	1.2
RSA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
ZIMBABWE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.1	1.1	1.2
LOAN RAISED/REPAID												
	DEBT : EQUITY RATIO				50	50						
CHILE	-37.3	-48.2	-36.5	-20.9	0.0	20.6	22.6	16.5	18.1	13.1	14.3	9.8
INDONESIA	-36.2	-46.2	-34.7	-19.9	0.0	19.7	21.7	15.8	17.4	12.6	13.7	9.1
PNG	-36.8	-47.2	-35.4	-21.4	0.0	20.3	22.3	16.3	17.8	12.9	14.1	9.4
RSA	-36.8	-47.5	-35.8	-21.0	0.0	20.3	22.3	16.3	17.9	12.9	14.2	9.4
ZIMBABWE	-36.2	-46.2	-34.7	-20.6	0.0	19.8	21.8	15.9	17.5	12.6	13.8	9.2
INTEREST PAID ON LOANS (#)												
CHILE	0.0	3.7	8.5	12.1	14.1	14.1	12.2	10.0	8.5	6.8	5.6	4.3
INDONESIA	0.0	3.0	6.8	9.7	11.3	11.3	9.7	8.0	6.8	5.4	4.5	3.4
PNG	0.0	3.8	8.7	12.3	14.5	14.5	12.5	10.2	8.7	7.0	5.7	4.4
RSA	0.0	3.8	8.7	12.4	14.5	14.5	12.5	10.3	8.7	7.0	5.8	4.4
ZIMBABWE	0.0	3.4	7.6	10.9	12.8	12.8	11.0	9.0	7.6	6.1	5.1	3.9
EQUITY EARNINGS (#)												
CHILE	-37.3	-48.2	-36.5	-20.9	3.1	23.0	37.6	48.2	24.7	27.8	30.1	36.8
INDONESIA	-36.2	-46.2	-34.7	-19.9	2.8	18.1	29.5	24.5	22.0	27.1	27.5	32.7
PNG	-36.8	-47.2	-35.4	-21.4	0.0	15.2	27.1	28.5	34.3	39.9	30.5	34.5
RSA	-36.8	-47.5	-35.8	-21.0	1.4	20.9	35.4	45.8	47.9	56.9	51.5	29.2
ZIMBABWE	-36.2	-46.2	-34.7	-20.6	0.9	15.4	26.7	33.3	17.4	22.8	23.3	28.6
HOST GOVERNMENT RECEIPTS												
CHILE	2.8	4.7	4.2	4.6	3.6	2.8	2.3	2.3	21.8	23.7	26.3	28.0
INDONESIA	0.5	1.5	2.2	4.6	6.4	11.0	13.5	28.2	31.9	35.0	36.7	39.6
PNG	1.6	2.5	1.7	4.0	4.3	8.1	10.4	19.4	15.1	18.2	29.9	34.3
RSA	1.9	3.6	2.8	3.1	2.1	1.4	1.0	1.0	1.0	1.1	8.8	39.2
ZIMBABWE	0.5	1.1	1.4	3.6	4.8	9.4	12.0	25.4	32.8	35.5	37.2	40.0

(#) Net of with-holding taxes.

COUNTRY CRITERIA SIMULATION MODEL		DISTRIBUTION OF CASH FLOW BY PARTICIPANT										
CALENDAR YEARS		2007	2008	2009	2010	2011	2012	2013	2014	2015	NET TOTALS 1995 MONEY	CAPITAL
ALL AMOUNTS IN US\$ MILLIONS (MONEY-OF-THE-DAY)												
REVENUES GENERATED												
CHILE		209.0	215.3	221.8	228.4	235.3	242.3	187.2	128.5	105.9	2331	-275
INDONESIA		209.0	215.3	221.8	228.4	235.3	242.3	187.2	128.5	105.9	2331	-264
PNG		209.0	215.3	221.8	228.4	235.3	242.3	187.2	128.5	105.9	2331	-271
RSA		209.0	215.3	221.8	228.4	235.3	242.3	187.2	128.5	105.9	2331	-272
ZIMBABWE		209.0	215.3	221.8	228.4	235.3	242.3	187.2	128.5	105.9	2331	-265
DISTRIBUTED AS FOLLOWS												
EMPLOYER PAYMENTS												
CHILE		56.8	58.5	60.3	62.1	63.9	65.9	50.9	37.9	29.0	616	
INDONESIA		50.2	51.7	53.2	54.8	56.5	58.2	44.9	30.9	25.4	560	
PNG		52.6	54.2	55.8	57.5	59.2	61.0	47.1	32.3	26.6	596	
RSA		54.2	55.8	57.5	59.2	61.0	62.8	48.5	33.3	27.5	604	
ZIMBABWE		53.6	55.2	56.8	58.5	60.3	62.1	48.0	32.9	27.1	597	
MAN. & ADMIN. (#)												
CHILE		2.4	2.5	2.5	2.6	2.7	2.8	2.1	1.5	1.2	37	
INDONESIA		2.4	2.5	2.5	2.6	2.7	2.8	2.1	1.5	1.2	37	
PNG		2.5	2.5	2.6	2.7	2.8	2.9	2.2	1.5	1.3	38	
RSA		2.1	2.1	2.2	2.3	2.3	2.4	1.9	1.3	1.1	32	
ZIMBABWE		2.4	2.5	2.5	2.6	2.7	2.8	2.1	1.5	1.2	37	
OTHER COSTS + CAPEX												
CHILE		67.7	69.7	71.8	74.0	76.2	78.5	60.6	41.6	34.3	1053	
INDONESIA		67.7	69.7	71.8	74.0	76.2	78.5	60.6	41.6	34.3	1053	
PNG		67.7	69.7	71.8	74.0	76.2	78.5	60.6	41.6	34.3	1053	
RSA		67.7	69.7	71.8	74.0	76.2	78.5	60.6	41.6	34.3	1053	
ZIMBABWE		67.7	69.7	71.8	74.0	76.2	78.5	60.6	41.6	34.3	1053	
ROYALTIES (#)												
CHILE		1.2	1.3	1.3	1.4	1.5	1.5	1.5	1.1	0.7	10	
INDONESIA		1.4	1.5	1.6	1.6	1.7	1.8	1.8	1.3	0.8	12	
PNG		1.4	1.6	1.7	1.8	1.9	2.0	2.0	1.4	0.8	12	
RSA		1.2	1.3	1.4	1.4	1.5	1.5	1.6	1.2	0.8	8	
ZIMBABWE		1.3	1.3	1.4	1.4	1.5	1.5	1.6	1.2	0.8	11	
LOAN RAISED/REPAID												
CHILE		10.6	8.3	9.3	0.0	0.0	0.0	0.0	0.0	0.0	111	-138
INDONESIA		10.1	7.9	8.9	0.0	0.0	0.0	0.0	0.0	0.0	107	-132
PNG		10.4	8.1	9.2	0.0	0.0	0.0	0.0	0.0	0.0	110	-136
RSA		10.4	8.1	9.2	0.0	0.0	0.0	0.0	0.0	0.0	110	-136
ZIMBABWE		10.2	8.0	9.0	0.0	0.0	0.0	0.0	0.0	0.0	107	-133
INTEREST PAID ON LOANS (#)												
CHILE		3.3	2.2	1.2	0.0	0.0	0.0	0.0	0.0	0.0	89	
INDONESIA		2.6	1.8	0.9	0.0	0.0	0.0	0.0	0.0	0.0	71	
PNG		3.4	2.3	1.2	0.0	0.0	0.0	0.0	0.0	0.0	92	
RSA		3.4	2.3	1.2	0.0	0.0	0.0	0.0	0.0	0.0	92	
ZIMBABWE		3.0	2.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	81	
EQUITY EARNINGS (#)												
CHILE		37.7	42.2	43.4	55.1	56.8	58.7	45.9	30.9	28.8	434	-138
INDONESIA		33.5	36.9	37.9	46.9	48.3	49.8	39.2	28.0	23.9	361	-132
PNG		34.2	36.8	37.2	46.7	48.4	50.4	40.5	30.3	27.8	385	-136
RSA		28.9	32.6	33.1	44.0	45.5	47.0	36.7	26.0	22.4	426	-136
ZIMBABWE		29.4	32.8	33.6	42.7	44.0	45.4	35.2	24.5	20.9	318	-133
HOST GOVERNMENT RECEIPTS												
CHILE		29.3	30.7	31.9	33.3	34.2	35.0	26.1	15.6	12.0	257	
INDONESIA		41.1	43.4	44.9	48.4	49.9	51.3	38.5	25.2	20.3	395	
PNG		36.8	40.1	42.2	45.7	46.7	47.6	34.7	21.3	15.2	327	
RSA		41.1	43.3	45.4	47.5	48.0	50.0	37.9	25.1	19.9	279	
ZIM' /E		41.6	43.9	45.5	49.2	50.6	52.0	39.7	26.8	21.5	393	

(#) Net of with-holding taxes.

COUNTRY CRITERIA SIMULATION MODEL		BASE SCENARIO				
TOTALS FOR CASHFLOW COMPONENTS LIFE OF PROJECT BY COUNTRY		US \$ millions (1995 money) unless stated otherwise				
CRITERIA		CHILE	INDONESIA	PNG	SOUTH AFRICA	ZIMBABWE
INFLATION RATES:	U.S.A.	3.0%	3.0%	3.0%	3.0%	3.0%
	COUNTRY INFLATION RATE	10.0%	8.0%	5.0%	16.0%	20.0%
EXCHANGE RATES PER US DOLLAR		0.40	2.25	1.25	3.70	9.08
CURRENCY NAME		PESO x 1000	RUPIAH x 1000	KINA	RAND	Z-DOLLAR
GOLD PRICE		380.00	380.00	390.00	380.00	380.00
GOLD REVENUE		2.41	2331	2331	2331	2331
POWER/SERVICES/STORES		481	481	481	481	481
HUMAN RESOURCES		538	538	538	538	538
OTHER ON-MINE COSTS		126	126	126	126	126
TOTAL ON-MINE COSTS		1145	1145	1145	1145	1145
MANAGEMENT FEES		27	27	27	27	27
CAPITAL EXPENDITURE		379	379	379	379	379
MANAGEMENT FEES		18	18	18	18	18
EXPLOATION EXPENDITURE		67	67	67	67	67
PROP. ROYALTY ON GOLD		0	42	29	0	0
EXPORT ROYALTY		0	0	0	0	0
TAX ON ALLUVIAL GOLD		0	0	12	0	0
SALES TAXES / VAT		0	0	15	0	49
SOCIAL SECURITY CHARGES		11	22	38	66	59
TRAINING EXPENSES		5	0	11	0	0
CUSTOMS DUTIES		10	0	9	9	0
LAND/BUILDING TAXES		0	0	0	0	0
DEAD RENT		0	0	0	0	0
STAMP DUTIES		1	0	0	0	0
REAL ESTATE TAX		0	0	0	0	0
CAPITAL TAX		0	0	0	2	0
MINING CONCESSION FEES		0	0	0	0	0
EXERCISE TAX: AUTO FUEL		8	0	0	0	0
DIESEL		10	0	0	0	0
ROYALTY (NON-GOVN.)		15	15	13	11	13
COMPANY TAXATION		211	233	197	251	244
TAX CREDIT FOR INV. REC. PERIOD		0	0	14	0	0
TAX CREDITS		4	0	9	0	0
ADDITIONAL PROFITS TAX		0	0	0	0	0
LOAN REPAYMENTS		111	107	110	110	107
INTEREST ON LOANS		90	89	92	92	90
INTEREST CHARGE BY LOCAL BANK		3	0	0	0	0
ACTUAL HONOR PAID		02	0	0	0	0
CASHFLOW EARNINGS (NET)		168	188	193	154	133
WITHOLDING TAXATION:						
DIVIDENDS: SUBSIDIARY		0	90	79	0	80
ROYALTIES: NON-ASSOC.		5	3	1	3	3
LOAN INTEREST		4	18	0	0	9
MANAGEMENT FEES		9	9	6	14	9
ROYALTIES TO LANDOWNERS		0	0	0	0	0
ALLOCATION OF FUNDS SUMMARY:						
REVENUE + INITIAL CAPITAL		2606	2525	2602	2603	2596
SUMMATION OF DISTRIBUTIONS		2606	2595	2602	2603	2596
EQUITY INVESTED		-128	-131	-136	-136	-133
INVESTORS' EARNINGS (NET OF W/H TAX)		434	361	385	426	318
DEBT: PRINCIPAL INVESTED/REPAID		-128	-132	-130	-136	-133
INTEREST ON LOANS (NET OF W/H TAX)		281	178	201	202	188
ROYALTIES (NET OF W/H TAX)		10	12	12	8	11
MAN. FEES (NET OF W/H TAX)		37	37	38	32	37
EMPLOYEES' PAYMENTS		616	560	586	604	597
OP. COSTS+CAPEX		1053	1053	1053	1053	1053
HOST GOVERNMENT RECEIPTS		257	395	337	379	393
		(NOTE: SEE PERCENTAGES OF REVENUES+CAPEX OVERLEAF)				

COUNTRY CRITERIA SIMULATION MODEL		BASE SCENARIO US \$ millions (1995 money) unless stated otherwise				
TOTALS FOR CASHFLOW COMPONENTS LIFE OF PROJECT BY COUNTRY						
CRITERIA		CHILE	INDONESIA	PNG	SOUTH AFRICA	ZIMBABWE
PAYBACK PERIOD COUNTER (IN YEARS)		6.06	7.18	6.48	5.10	8.04
NEGATIVE CASHFLOW PERIOD (IN YEARS)		-4.08	-4.00	-4.00	-4.00	-4.00
YEAR OF FIRST TAX PAYMENT		2003	2002	2002	2005	2002
NPV CALCULATIONS FOR PROVIDERS OF CAPITAL: DISCOUNT RATE IN REAL TERMS						
EQUITY HOLDERS	0.0%	296	229	250	290	186
	5.0%	113	76	86	118	50
	10.0%	23	1	6	31	-15
	15.0%	-24	-37	-35	-16	-47
	20.0%	-49	-57	-57	-43	-64
IRR VALUES		11.06%	10.07%	10.54%	12.91%	8.53%
DEBT PROVIDERS	0.0%	63	46	66	66	55
	5.0%	13	2	16	16	8
	10.0%	-17	-23	-15	-15	-20
	15.0%	-36	-42	-34	-34	-38
	20.0%	-49	-52	-46	-47	-49
IRR VALUES		6.86%	5.24%	7.26%	7.26%	6.25%
AS A % OF REVENUES	AVERAGE					
EQUITY INVESTED	-3.8%	-5.9%	-5.7%	-5.8%	-5.8%	-5.7%
INVESTORS' EARNINGS (NET OF W/H TAX)	16.0%	16.6%	15.5%	16.6%	18.3%	13.7%
DEBT PRINCIPAL INVESTED/REPAID	-5.8%	-5.9%	-5.7%	-5.8%	-5.8%	-5.7%
INTEREST ON LOANS (NET OF W/H TAX)	8.3%	8.6%	7.6%	8.6%	8.6%	8.1%
ROYALTIES (NET OF W/H TAX)	0.4%	0.4%	0.5%	0.5%	0.3%	0.5%
MAN. FEES (NET OF W/H TAX)	1.5%	1.6%	1.6%	1.6%	1.4%	1.6%
EMPLOYEES' PAYMENTS	25.4%	26.4%	24.0%	23.2%	25.9%	25.6%
OP. COSTS+CAPEX	45.2%	45.3%	45.2%	45.2%	45.2%	45.2%
HOST GOVERNMENT RECEIPTS	14.2%	11.0%	17.0%	14.0%	12.0%	16.9%
INVESTORS POSITIONS:						
CAPITAL	-11.6%	-11.8%	-11.3%	-11.6%	-11.7%	-11.4%
EARNINGS	24.8%	27.2%	23.1%	25.2%	26.9%	21.7%
MANAGEMENT & ROYALTIES	2.6%	2.6%	1.1%	2.1%	1.7%	2.0%
HOST COUNTRY	84.8%	82.6%	86.1%	84.3%	83.1%	87.6%

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Name of thesis: Criteria influencing international mining investment.

PUBLISHER:

University of the Witwatersrand, Johannesburg

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