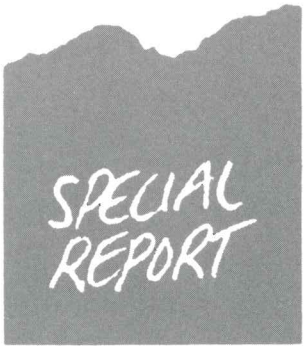

The corporate structure in the international mining industry: The present situation and the outlook for the mid 1990s

By Magnus Ericsson, and Andreas Tegen

With examples from the RMG Database two members of the Group analyse recent structural changes in the mining industry and predict a turbulent period in the mid-1990s.

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Introduction

The early 1990s have been a time of unprecedented change in world politics and the world economy. The political map drawn after the Second World War and the Cold War is no longer valid and new alliances are being formed. The world is also in the midst of a period of complex and interrelated economic transformations, which will have far reaching political consequences:

- The collapse of the centrally planned economies.
- The recession and the privatization process in the industrialized countries.
- The economic restructuring in the developing countries enforced by the World Bank and other financial institutions from the industrialized countries.

The crisis and the Top 50 companies in Western world mining

The international mining industry has come into focus during the present recession. "Merger mania" is a headline which has been used to describe the recent developments in the mining industry. The purpose of this survey is to give an up-to-date picture of the ownership in the mining industry, to describe the changes that occurred during the 1980s and early 1990s, and finally, to provide an outlook for the 1990s.

Changes in ownership in the mining and smelting industries are continuously monitored by the Raw Materials Group. Based mainly on first hand corporate sources the RMG Database has been established focusing on ownership and production in mining and refining world wide. The present analysis is based primarily on figures from the RMG Database. It is our intention to update the analysis and the Top 50 list at least annually.

A list of the 50 largest mining companies in the world in 1990 is given in Table 1. The list covers mainly metals but also of the industrial minerals diamonds, phosphate rock and potash. The method of calculating the table is detailed in the enclosed Appendix.

AAC the world largest mining company - geared up for growth

Anglo American Corporation of South Africa (AAC) is the world's most important mining group measured by the value of the non-fuel minerals production it controlled in 1990. Controlling almost 9 per cent Anglo is more than twice as big as its closest competitor the British RTZ. The top rank of AAC is mostly, but not only, due to its dominant position in two high value products: gold and diamonds. Table 2.

The Anglo group companies are the world's leading producers of antimony, chromium, diamonds, gold, rhodium, tungsten and vanadium. AAC is the second largest controlling company in nickel, palladium and platinum. In cobalt, copper, lithium, manganese, niobium, tantalum and uranium it is among the five most important companies.

Anglo, tightly knitted together with De Beers, and controlled by the Oppenheimer family was at the top also in 1975. The group has maintained its top position, but from the mid 1980's its relative strength has been declining. The most important factor behind this development is the decreasing gold production in South Africa. In 1984 AAC controlled almost 16 per cent of the value of "Western world" non-fuel minerals production. In 1990 the corresponding figure was down to 8 per cent.

In 1992, however, it seems as if AAC is geared up for growth in the mid 1990s. Following the stepwise abolition of apartheid and the political democratization process in South Africa sanctions will eventually be lifted completely. It will once again be possible for the South African mining companies to invest in its neighboring countries and also further north in Africa. Anglo will be fully recognized as a partner for cooperation as the present negotiations with the Zambian government about a possible invest-

ment to refurbish ZCCM show. When the political and economic situation in South Africa and the SADCC countries gradually stabilizes they will all be in focus for new mining ventures. This is particularly so for the mineral rich and little explored Angola and Namibia and in the longer run also Mocambique. Anglo, and the other South African mining groups, will benefit more than their main overseas competitors from this development:

- They will be able to expand operations in a geographical area which they are familiar with, both geologically and culturally, instead of having to invest in new and for them less well known areas such as Australia or Latin America.
- They will again be allowed to use fully the international finance markets to fund exploration and investments in both green field and rehabilitation projects. This will further strengthen the very strong financial position of Anglo.

RTZ - the European giant

RTZ Corporation plc has been growing strongly during the last 15 years. In 1990 the London based mining group controlled 4.2 per cent of the value of non-fuel mineral production in the "Western world". In 1975 Rio Tinto Zinc, as it was then called, controlled only 2.6 per cent of the value of non-fuel mineral production in the "Western world" and was number four in the list after Anglo, Gecamines and Consolidated Goldfields. In 1984 RTZ had reached the second place and increased its control to 3.5 per cent. The growth rate has been phenomenal, 35 per cent increase from 1975 to 1984 and 20 per cent from 1984 to 1990.

RTZ is the worlds leading producer of titanium, among the three largest producers of bauxite, copper, iron ore, lead and zirconium and among the ten largest for lithium, molybdenum, rare earths, silver and tin. Table 3.

RTZ is a truly transnational company with subsidiaries spread all over the world, Comalco, Hammersley Holdings and Pasminco in Australia, Kennecott, QIT and Rio Algom in North America, Escondida and Morro do Ouro in Latin America. RTZ is among the few transnational mining companies which is maintaining a presence in Southern Africa, where it has managed to keep a stake in Palabora in South Africa, Rössing in Namibia and Rio Tinto Zimbabwe in Zimbabwe. With an extended base in Namibia exploration activities in Southern Africa is now being stepped up.

RTZ's strategy differs slightly from most of its transnational competitors in that it sticks to the mining stage of the production chain and has not tried to diversify into down stream processing and manufacturing of metals beyond the refining stage. It is also among the few metal mining companies which has a strong interest in industrial minerals.

Two state owned mining enterprises among the five largest companies

In the third and fourth places on the Top 50 companies list follow two successful state mining companies from the developing countries. Codelco and ENAMI are under the control of the state of Chile and CVRD is controlled by the Brazilian state. Both the Chilean and the Brazilian governments control around 3 per cent of the total value of the "Western world" non-fuel mineral production at the mining stage. After these four giants follows the rest of the leading transnational mining companies from Brascan/Noranda controlling 1.8 per cent at rank 5 down to USX at 50th place and in control of 0.3 per cent of the value of all non-fuel mineral production in the "Western world". The ten largest companies dominate the industry, and together control almost 30 per cent of the value of the total output.

The concentration has been fairly constant from the mid 1970s and into the early 1980s. In the late 1980s the corporate concentration has decreased somewhat mainly due the establishment of many small new producers, in particular in gold mining. The 25 largest companies controlled 48 per cent of the total value of all non-fuel mineral production in 1975 down to 47 per cent in 1984 and further to 42 per cent in 1990.

European mining in a strong position

Among the 25 largest companies 15 are from the industrialized countries of Europe (RTZ, Hanson, Trelleborg and Metallgesellschaft), North America (Brascan/Noranda, Inco, Phelps Dodge, Asarco, Placer-Dome, Cyprus Minerals, Freeport McMoran and IMC) and Australia (Broken Hill Pty, Western Mining and MIM). Three come from South Africa (AAC, Gencor and Barlow Rand) and only 7 from the developing world.

All the developing country companies among the 25 largest are state controlled. In addition to Codelco and CVRD, Zaire's Gecamines mining copper and cobalt, Moroccan state controlling the phosphate giant Office Cherifien des Phosphates (OCP) and the base metal producer *Bureau de Recherches et de Participations Minière* (BRPM), the Zambian ailing copper company ZCCM, the tin producer *Malaysia Mining Corporation* (MMC) and the Indian state controlled producers of several different minerals are completing the list. The first non-state controlled company from the developing countries is Grupo Industrial Minera Mexico in 33rd place.

The European mining companies have been growing strongly since the mid 1980s and companies like Trelleborg (rank 17), Metallgesellschaft (25) and Outokumpu (38) have been pushing up through the ranks with acquisitions and mergers all around the world. In 1990 all European companies together controlled 19 per cent of the production controlled by the 50 largest corporations. The European companies are in general more international in their operations than their competitors from North America and Australia. The only Japanese company represented is Mitsui & Co at the 49th

place. This is an evidence of continuing contradictions between the three main industrialized centers Europe, USA and Japan. Even if the event of the European integration in 1992 does not have much direct impact on the mining industry the political unity of the European countries will reinforce the strength of the European companies and bolster the underlying geopolitical contradictions. The transnational mining companies from Europe have had the upper hand during the last five years, but the American companies are growing stronger.

American companies back from the dead

The American companies are slowly rising from their bottom position in the mid-80s. In 1984 American companies were only controlling 10 per cent of the production controlled by the 50 largest mining companies in the "Western world". In 1990 the figure has risen to 13 per cent. However there is still a long way to go before the 1975 figure, which was more than 20 per cent, is reached.

High corporate concentration

Corporate concentration, as measured by the percentage of "Western world" production controlled by the ten largest companies, varies from a low of just below 40 per cent for silver up to around 50 per cent for lead and zinc and as high as more than 90 per cent for beryllium, lithium, the PGMs and rare earths. The average level of corporate concentration among the metals is 75 per cent of "Western world" production. The single biggest companies are found in the beryllium, vanadium and the rare earths industries where Brush Wellman, Anglo American and Molycorp controls 82, 60 and 60 per cent respectively of "Western world" production. The total average largest company controls 35 per cent of the mine production of each metal/mineral. Among the economically more important metals the single largest companies are found in the nickel and gold industries, where Inco and Anglo American respectively controls 30 and 24 per cent of "Western world" production. In contrast the biggest silver, lead and zinc company controls only around or even below 10 per cent of "Western world" production.

Integration between mining and smelting companies

There is no clear trend in corporate concentration for all metals during the 1980s, except that the changes are relatively minor. Only two minerals exhibit a strong, clear trend over the whole period, gold and iron ore. Corporate concentration in gold has decreased by almost 50 per cent. Iron ore exhibits a growing trend where the single biggest company's control has grown by 70 per cent and concentration at the level of 10 companies has increased with approximately 30 per cent from 1975 to 1990.

However, there is a slow but continuous horizontal integration process taking place, i e that the newcomers to one branch of the industry are already established in another branch. In 11 economically important minerals (bauxite, copper, gold, iron ore, lead manganese, nickel, phosphate, potash, tin and zinc) the number of different companies among the 10 largest ones has decreased from 82 in 1975 to 67 in 1989.

There is also an integration process between the mining and refining industries which is important to note. From 1975 to 1989 the number of different companies among the top 10 in both mining of the 11 minerals mentioned above and in refining of aluminium, copper, lead, nickel, tin and zinc has decreased from 102 to 86.

Continued internationalization and increased control by transnational mining companies

Almost a third of the total output by the 25 largest producers of 26 minerals/metals is controlled by foreign owned companies. The degree of foreign control varies from 89 per cent in titanium and 58 per cent in bauxite down to almost zero in vanadium. Copper, gold, iron ore are all close to the average value. Given the present privatization trend and the lack of national capital in most developing countries, the share of foreign controlled mineral production is set to increase in the next few years.

Oil companies - still in the industry

The oil companies have left much of their holdings in the mining industry but they still control around 5 per cent of "Western world" copper production and 2 per cent of the gold production. A few oil companies are still active in the non-fuel mineral sector such as Freeport and Shell. Others like Amoco, Nerco and BP are looking for buyers to their last mineral holdings. The British junior company Cluff is going the other way trying to sell off its oil and gas division to concentrate on its African gold ventures. Oil companies still maintain an important role in phosphate rock production. Freeport, Mobil, Oxy and Elf Aquitaine through Texasgulf together control almost 20 per cent of Western world production.

State mining an important force

A majority of companies from the developing countries, and all of the developing country companies in the Top 50 companies list, are state controlled. This is still so, in spite of the present wave of privatizations, which have not yet had its full impact. It is also important to note, as for example in Chile, that the privatization trend also has met with strong opposition from the miners' unions and other national interests groups. The share of total non-fuel mineral production controlled by state mining enterprises has decreased since the mid 1980s but is still higher than in 1975. The privatizations, which have been made so far, have mostly taken place in the industrialized countries. Around 20 per cent or more of the bauxite, copper, iron ore,

nickel, phosphate and tin industries were state controlled in 1989. In cobalt and diamonds the figure is even higher. In lead and zinc the figure was around 10 per cent, while in PGMs there is almost no state controlled production outside the *Confederation of Independent States* (CIS).

The African state owned copper companies have been falling back all through the 1980s while the Latin American state companies in general have fared better.

Contrary to common wisdom many of the world's most successful mining companies are state controlled, Finnish Outokumpu, Chilean Codelco, French BRGM and Pechiney, Malaysian MMC, Brazilian CVRD and Swedish LKAB, to mention the most important ones. The speed of privatization will probably increase during the next few years but the state sector will continue to play an important role in the international mining industry.

The integration of the mining and metallurgical industries of the former USSR into the world market will initially further increase the state controlled sector of the international mining industry. The member states of the CIS are together the most important producer of iron ore, lead, zinc, nickel and among the three most important producers of chromium, copper and several others.

The race for Russian resources has already started

The state sector in the former USSR will probably survive longer than was anticipated only a year ago. In the long run the necessity to attract investment capital for the rehabilitation of the mining and smelting industries in the formerly centrally planned economies of Eastern Europe and the Soviet Union and to save the environment will make it necessary to sell out at least parts of the industry.

There are also important advantages with a continued state control but in spite of this the state sector will gradually drop. European mining companies, with long standing trading and investment contacts with these countries such as German Metallgesellschaft, Finnish Outokumpu and French Pechiney, will, together with Japanese and Korean companies coming from the Pacific shores, have major advantages over their North American and Australian competitors approaching the Siberian resources.

However, long negotiated deals such as a refurbishing of the Kola peninsula metallurgical industries have been delayed. The first deals have instead been made by American Newmont, Vancouver based Goldbelt Resources and the Australian consortium Star Technology Systems. All three companies have entered into joint venture agreements with a minority share in return for injections of capital and technology. The projects considered are predominantly in gold and precious metals mining.

The mid 1990s - a turbulent period

The most important structural changes during the first part of the 1990s include:

• *Rationalization among the many newly established and quickly growing gold companies.*

Typical examples of this process are:

The quick growth of Australian Normandy Poseidon including a restructuring of the group and acquiring among other companies ACM Gold and Mt Leyshon.

The merger between BHP Gold and Newmont Australia to form another strong Australian gold company Newcrest.

The creation of TVX Gold by joining the forces of Inco Gold and Consolidated TVX.

Newmont Gold, which is North America's largest gold producer and Toronto based American Barrick tried to merger in 1991 but nevertheless came to an agreement on cooperation in several projects in early 1992.

Also in early 1992 Homestake Mining and International Corona agreed to merge. Together the two companies, which are already among the biggest gold producers in USA/Canada, will form one of the largest gold producers outside South Africa.

• *Restructuring of whole groups to meet the new demands of the mid 1990s.*

Metallgesellschaft has created a new holding company, Rheinische Zink Gesellschaft. The MIM-Teck-Metall Mining web of interlocking holdings have been changed and the old Metallgesellschaft has, in our view been reinforced by this reshuffle.

Oppenheimer-controlled Minorco has made some important changes and now owns the Hudson Bay Mining and Smelting holdings directly instead of through Inspiration Resources. Minorco has also bought Freeport Gold. Anglo further sold off its 6 per cent holdings in Gencor.

The mining and refining activities of the Belgian holding company Société Générale de Belgique, such as the diamond producer SIBEKA has been regrouped and concentrated in one subsidiary, ACEC Union Minière.

• *The Japanese companies have continued their strategy to participate in new ventures through equity rather than only through long term contracts.*

Production at the Escondida copper mine, with the Japanese JECO consortium holding 10 per cent started in full in 1991. A number of new projects such as the expansion of production at the Morenci joint venture between Phelps Dodge and Sumitomo Metal Mining are in the pipe line.

• *The South African scene is changing.*

Rand Mines has divested of much of its mining subsidiaries. Anglo and Samancor took over the chromite operations in late 1991 and Gencor acquired the platinum producing subsidiaries. Several of the European and North American mining companies are forging new links with the south African groups to be able to profit from the lifting of sanctions.

"Single price and cash payment"
The signboard of Mitsui Hachirobei Takatoshi. (Left)
The Japanese Sogo Shosas are among the key actors in the international mineral markets.
Their equity participation in mining ventures is predicted to increse in the mid -1990s.

Two examples are: French BRGM has announced a cooperation with Genmin and closer connections have been established between ACEC Union Minière and DeBeers.

The political and economic changes mentioned in the introduction are taking place at an increasing speed and will continue to influence the corporate structure of the international mining industry profoundly in the next few years. Additional pressure to relocate and hence to restructure is also coming from higher environmental demands. Bearing in mind the strength of these political/economical changes the ownership structure in the international mining industry has, however, been surprisingly stable.

The scene is set for a turbulent period in the mid-1990s. Most probably we will witness the same types of structural changes that we have seen in the early 1990s but on a larger scale.

- Rationalization and mergers among the junior companies established in the 1980s.

- Restructuring of the long established mining houses to meet the demands of the 1990s.

- More Japanese equity participation in mining ventures.

- Expansion of the South African mining companies into Southern Africa and new links being created between the South African groups and overseas companies.

- More transcontinental presence and competition. For example the European and South African companies which have traditionally dominated African mining will experience growing competition from Australian companies in Africa and European companies will enter more actively into Latin America to struggle with the American transnationals.

APPENDIX

Control

The concept of control is crucial when studying corporate structures. To have control makes it possible to act decisively on strategically important issues. Such issues include the broad policies of a company, decisions on large investments, buying or selling of subsidiaries and power to appoint or dismiss management. To be in control of a company does not necessarily include having a day-to-day influence over all its decisions. It is difficult to define control exactly and even more difficult to measure it accurately.

A vivid example of the difficulties of assessing who is in control of a specific company is given by the fierce and protracted take-over battle which raged between Minorco and Consolidated Gold Fields in 1989. Consolidated Gold Fields managed in the end to fight off the hostile bidder, Minorco, but was nevertheless directly afterwards bought by the corporate raider Lord Hanson. On the other hand, if the Minorco bid had been successful, which it was close to, it would have proven that a minority holding is often sufficient to serve as a basis for a grasp for total control at the right moment.

Control can be exercised through many means of which ownership is the most common and important one. But ownership is not the only way of exercising control. In Japan the Sogo Shoshas build their groups with close ties based on factors other than ownership and board directors. During the 1980s other ways of exercising control such as through administrative and technical management, vertical integration, interlocking directorates, long term contracts, financing arrangements and proprietary technologies was increasingly used to gain control over other companies. There are recent signs, however, that this trend is slowly changing and that ownership will continue to be the most important means of control during the 1990s. We use ownership and management when determining who is in control of a specific company. In some borderline cases our assessment of who controls who is also based on additional information. We have used a refined method to assess control based on relative ownership shares and management situation to determine control. For more details please see *Natural Resources Forum*, Volume 14 number 1 1990 p. 14, "The evolving structure of the European mining industry." The RMG method is built on ownership and management parameters, although there are a number of other factors affecting corporate control. If these variables could also be measured, it would be found that the corporate concentration is larger than the figures in this study indicates.

Corporate control

The tables on corporate control in 30 minerals and metals are calculated in the following way: the definition of control as discussed above is used to establish what companies are in control of the pro-

duction of each metal and mineral. In a second step the producing mining companies' output is systematically attributed to the controlling company or companies. All of the producers' production is allocated to controlling companies at the top of the ownership hierarchies. This is done in such a way that all double accounting is eliminated. To give one example: if a mine is owned by two mining houses each with a 25 % stake and the remaining 50 % is held by 2000 small shareholders, the two major shareholders are considered to be in control of 50 % each of the total production of the mine. Where it has not been possible to identify production by company (normally less than 5 % of world production and for the most important minerals less than 1 per cent) it can mainly be attributed to very small operations, such as the garimpeiro gold diggings in Brazil and small tin dredging companies in Malaysia. This production is considered to be controlled by local unidentified interests in tables of this report.

Top 50 mining companies

In this table the production controlled by a specific mining company in several metals or minerals has been added to produce a grand total measure of the importance on a world scale of the various mining groups. This is done by calculating the share of the total value of mine production of all non-fuel minerals in the Western world and multiplying this figure with the share of production controlled by each controlling company and adding all the control shares. The approximated relative values have been computed by UNCTAD.

When interpreting the Top 50 table it is important to note that it only gives an indication of the importance of a specific company. There are a number of factors which influence the position of a specific company in the list. The importance of these factors decreases when comparing results obtained using the same method from different years. ■

Table 1
Top 50 in Western world mining in 1990
Ranked by approximate share of total value of Western world mine production of non-fuel minerals in 1990.
Approximate (A) and cumulative share (B) of total value (%)

Rank/ Controlling company	Country	A.	B
1 Anglo American Corp of South Africa Ltd	South Africa	8.4	8.4
2. RTZ Corporation plc	UK	4.2	12.6
3. State of Chile (Codelco and Enami)	Chile	3.0	15.6
4. State of Brazil (mainly CRVD)	Brazil	2.6	18.1
5. Brascan Ltd	Canada	1.8	20.0
6. Inco Ltd	Canada	2.6	18.1
7. Broken Hill Pty Co Ltd	Australia	1.5	23.3
8. State of Zaire (mainly Gecamines)	Zaire	1.5	24.8
9. Phelps Dodge Corp	USA	1.4	26.2
10. Hanson plc	UK	1.4	27.6
11. Gencor Ltd	South Africa	1.3	28.9
12. Asarco Inc	USA	1.3	30.2
13. Western Mining Corp Holdings Ltd	Australia	1.2	31.4
14. MIM Holdings Ltd	Australia	1.2	32.6
15. Placer Dome Inc	Canada	1.0	33.6
16. State of Morocco (OCP and BRPM)	Morocco	1.0	34.6
17. Trelleborg AB	Sweden	1.0	35.6
18. Cyprus Minerals Co	USA	0.9	36.5
19. State of Malaysia (mainly Malaysia Mining)	Malaysia	0.9	37.5
20. Freeport McMoran Inc	USA	0.8	38.3
21. State of India (various)	India	0.8	39.1
22. Barlow Rand Ltd	South Africa	0.8	39.9
23. State of Zambia (Zimco/ZCCM)	Zambai	0.8	40.6
24. International Minerals & Chemicals	USA	0.7	41.4
25. Metallgesellschaft AG	Germany (FR)	0.7	42.1
26. Rembrandt Group	South Africa	0.7	42.8
27. Anglovaal Ltd	South Africa	0.7	43.5
28. State of Yugoslavia	Yugoslavia	0.6	44.1
29. State of France (Pechiney, SNEA and others)	France	0.6	44.7
30. State of Peru (mainly Mineroperu/Centromin)	Peru	0.6	45.3
31. North Broken Hill Peko Ltd	Australia	0.6	45.9
32. Amax Inc	USA	0.6	46.5
33. Grupo Industrial Minera Mexico SA de CV	Mexico	0.6	47.1
34. Magma Copper Co	USA	0.5	47.6
35. Homestake Mining Co	USA	0.5	48.2
36. Lac Minerals Ltd	Canada	0.5	48.7
37. Cia Auxiliar de Empresas de Mineracao	Brazil	0.5	49.2
38. State of Finland (Outokumpu)	Finland	0.5	49.8
39. Iscor Ltd	South Africa	0.5	
40. State of Botswana (Debswana and BCL	Botswana	0.5	50.3
41. State of Indonesia (mainly PT Timah)	Indonesia	0.4	50.8
42. International Corona Cor	Canada	0.4	51.2
43. State of Venezuela (CVG and FIV)	Venezuela	0.4	51.6
44. State of Sweden (mainly LKAB)	Sweden	0.4	52.1
45. Aluminum Co of America	USA	0.4	52.5
46. BASF AG	Germany	0.4	52.9
47. Echo Bay Mines Ltd	Canada	0.4	53.3
48. Royal Dutch/Shell Group	UK	0.4	54.0
49. Keevil Holding Corp	Canada	0.3	54.3
50. State of Canada (mainly PLS)	Canada	0.3	54.7

Table 2
Mine and refinery production controlled by the 50 largest mining companies in 1990

Anglo American Corporation of South Africa Ltd, South Africa – *mine production*

Mineral/controlled producers ranked by size of production ■= full control, % = partial control		Country of incorporation or production	Producer's total production	Controlled share	Share of Western world
Antimony	**(kt)**			**3.96**	**16.9**
75%	Consolidated Murchinson Ltd	South Africa	5.26	3.96	16.9
Chromite	**(kt)**			**1 277e**	**15.5**
45%	Samancor Chrome Ltd	South Africa	2 000e	901e	10.9
■	Purity Chrome	South Africa	250e	250e	3.0
■	Zimbabwe Alloys Ltd	Zimbabwe	96	96	1.2
■	Cooperatives, Zimalloys controlled	Zimbabwe	30e	30e	0.4
Cobalt	**(kt)**			**2.02e**	**9.7**
29%	Zambia Consolidated Copper Mines	Zambia	4.84	1.40	6.7
■	Rustenburg Platinum Holdings Ltd	South Africa	0.40e	0.40e	1.9
■	Bindura Nickel Corp Ltd	Zimbabwe	0.12	0.12	0.6
50%	BCL Ltd (Bamangwato)	Botswana	0.21	0.10	0.5
Copper	**(kt)**			**361.7e**	**5.0**
29%	Zambia Consolidated Copper Mines	Zambia	496.0	143.3	2.0
■	Empresa Minera de Mantos Blancos SA	Chile	72.5	72.5	1.0
42%	Palabora Mining Co Ltd	South Africa	125.8	53.3	0.7
■	Hudson Bay Mining & Smelting Co Ltd	Canada	45.0e	45.0e	0.6
53%	Tsumeb Corp Ltd	Namibia	31.0e	16.4e	0.2
53%	O'Okiep Copper Co Ltd	South Africa	24.4	12.9	0.2
50%	BCL Ltd (Bamangwato)	Botswana	19.6	9.7	0.1
44%	Trout Lake Mine	Canada	10.8	4.8	0.1
60%	Namew Lake Mine	Canada	2.8	1.7	0.0
■	Bindura Nickel Corp Ltd	Zimbabwe	1.4e	1.4e	0.0
29%	Black Mountain Mineral Development	South Africa	2.4	0.7	0.0
Diamond	**(Mct)**			**17.65**	**21.2**
50%	De Beers Botswana Mining Co	Botswana	17.35	8.68	10.4
■	De Beers Consolidated Mines Ltd	South Africa	8.22	8.22	9.9
■	CDM Pty Ltd	Namibia	0.75	0.75	0.9
Gold	**(t)**			**410.59e**	**24.1**
■	Free State Consolidated Gold Mines	South Africa	114.37	114.37	6.7
■	Vaal Reefs Exploration & Mining Co	South Africa	73.37	73.37	4.3
■	Western Deep Levels Ltd	South Africa	38.49	38.49	2.3
67%	Driefontein Consolidated Ltd	South Africa	53.39	35.56	2.1
■	Randfontein Estates Gold Mining Co Ltd	South Africa	28.70e	28.70e	1.7
■	Western Areas Gold Mining Co Ltd	South Africa	14.20e	14.20e	0.8
■	Elandsrand Gold Mining Co Ltd	South Africa	14.16	14.16	0.8
53%	Kloof Gold Mining Co Ltd	South Africa	25.56	13.52	0.8
■	East Rand Gold and Uranium Co Ltd	South Africa	11.73	11.73	0.7
77%	Buffelsfontein Gold Mining Co Ltd	South Africa	13.63	10.51	0.6
70%	Mineraçao Morro Velho SA	Brazil	11.06	7.72	0.5
70%	Jerritt Canyon Mine	USA	10.20	7.14	0.4

Table 3
Corporate control in copper mining in 1990

Controlling company/state and controlled producers ranked by size of production ■= full control, % = partial control		Country of incorporation or production	Producer's total production (kt)	Controlled share (kt)	Share of Western world
1. State of Chile		Chile	–	**1 226.5**	**17.1**
■	Corp Nacional del Cobre de Chile	Chile	1 195.3	1 195.3	16.7
■	Enami	Chile	31.2	31.2	0.4
2. Phelps Dodge Corporation		USA	–	**585.7**	**8.2**
■	Morceni Mine	USA	304.5	304.5	4.2
■	Tyrone Mine (Phelps Dodge)	USA	144.5	144.5	2.0
67%	Chino Mines Co	USA	132.8	88.6	1.2
16%	Cuajone Mine (SPCC)	Peru	109.5	17.7	0.2
16%	Toquepala Mine (SPCC)	Peru	78.6	12.8	0.2
■	Cia Minera Ojos de Salado	Chile	11.2	11.2	0.2
■	Phelps Doge other mines	USA	5.3	5.3	0.1
45%	Black Mountain Mineral Development	South Africa	2.3	1.1	0.0
3. RTZ Corporation plc		**UK**	–	**469.7**	**6.5**
■	Bingham Canyon Mine	USA	236.1	236.1	3.3
49%	Sdade Mineira de Neves Corvo	Portugal	159.8	78.3	1.1
58%	Palabora Mining Co Ltd	South Africa	125.8	72.5	1.0
34%	Highland Valley Copper	Canada	163.6	55.0	0.8
■	Cobar Mines Ltd	Australia	17.6	17.6	0.2
31%	Escondida Mine	Chile	18.0	5.5	0.1
■	Cabacal Mine	Brazil	2.7	2.7	0.0
50%	Pasminco Ltd	Australia	3.1	1.5	0.0
■	Rio Kemptville Tin Corp	Canada	0.5	0.5	0.0
4. Asarco Inc		**USA**	–	**410.9e**	**5.7**
■	Ray Mines	USA	110.5	110.5	1.5
■	Mission Complex (Asarco)	USA	72.4	72.4	1.0
52%	Cuajone Mine (SPCC)	Peru	109.2	57.1	0.8
34%	Mexicana de Cobre SA	Mexico	161.0	54.7	0.8
52%	Toquepala Mine (SPCC)	Peru	78.6	41.1	0.6
27%	Cia Minera de Cananea SA	Mexico	112.0e	29.8e	0.4
50%	Continental Mine	USA	37.1	18.5	0.3
■	Troy Mine	USA	15.3	15.3	0.2
34%	Mexico Desarollo Industrial Minera	Mexico	17.7	6.0	0.1
■	Silver Bell Mine (Asarco)	USA	3.8	3.8	0.1
■	Corp Minera Nor Peru SA	Peru	0.9	0.9	0.0
50%	Cæur Mine	USA	0.8	0.4	0.0
38%	Galena Mine	USA	0.8	0.3	0.0
5. Anglo American Corp of South Africa		**South Africa**	–	**361.7e**	**5.0**
29%	Zambia Consolidated Copper Mines	Zambia	496.0	143.3	2.0
■	Empresa Minera de Mantos Blancos SA	Chile	72.5	72.5	1.0
42%	Palabora Mining Co Ltd	South Africa	125.8	53.3	0.7
■	Hudson Bay Mining & Smelting Co Ltd	Canada	45.0e	45.0e	0.6
53%	Tsumeb Corp Ltd	Namibia	31.0e	16.4e	0.2
53%	O'Okiep Copper Ltd	South Africa	24.4	12.9	0.2