

World Copper Mining Review: case study of Kazakhstan

Aliya Bukayeva*

Abstract

The article represents practical interest for students, masters, doctors, and experts of the branch. The article contains generalized comparative analysis of extraction and export of mineral-raw production in the Republic of Kazakhstan. At the article is considered the condition, production and consumption of metals in the world. For Kazakhstan this branch is one of the most important, which is defining not only the level of the economic development of the country, but also its economical safety, export potential, opportunities for further development.

Keywords: *copper mining, Kazakhstan, mineral-raw production*

INTRODUCTION

As the extractive industries have become more global, the competitiveness of mineral producers depends on several market conditions economic and political situation. In the case of copper, where the price is predominantly set by the market, rather than being determined by a single (or group of) entity, most producers concentrate on minimizing production costs in order

* PhD, Semey City, Republic of Kazakhstan, asper1975@mail.ru

to maximize operating profits.

Chapter 1. World Market Conditions for copper raw materials.

Increasing competition among copper producers since the late 1980s has prompted the implementation of strategies involving deep cost cuts, which are continually tested against other players in the international market (Mineral Resources of Kazakhstan, 2000).

Production costs are not only dependent on geological and technological conditions, but also strongly correlated with market conditions, legal and environmental regulations, taxation, and organizational and management structures.

Since many countries with high mineral potential from Latin America, Africa, Asia, and Eastern Europe have created favorable (in the last ten years) economic and political environments, foreign capital has begun to show interest in the mining industries in these countries. In the early 1980s foreign investment in mining was restricted mainly to Australasia and North America (Commodity Markets, Nov 1999, World Bank).

Since the greatest financial resources are in the hands of the industrialized countries, the first stage for investment was the participation of foreign capital in the privatization of formerly state-owned copper enterprises, mainly in Latin America. Privatization accelerated in the early 1990s; in Chile, for example, foreign investors have been allowed since 1991 to form joint ventures and operate in land areas previously under the control of Codelco (El Abra, Quebrada Blanca). In Peru, the government has allowed foreign capital to participate in most state-owned copper mines - La Caridad and Cananea - were privatized in 1992. These investments have changed the ownership structure of the copper industry on a global scale. In 1975 state-owned mines (excluding centrally planned economies) provided 26.4 % of the world's copper production. As a result of a wave of nationalization, this percentage increased to 35.5% in 1984, then fell to 25.6% in 1992, due to intensive privatization. The tempo of global privatization has slowed in the last several years, since the best assets available under reasonable political conditions have already been sold. What remains are a few either exclusive

assets such as Codelco, and the part of KGHM Polska Mied - SA or assets with long term potential only, such as Indian state mining company, or companies in Congo or in other politically unstable countries (Vestnik of mining mineral section of the Russian Academy of Sciences, 1996, #2, 3).

Since then - as a second stage - foreign investors have been concentrating on exploring and developing new ore deposits. Exploration activity has been moving in the 1990s from highly industrialized areas with extensive past mineral exploration, such as Australia, Canada, and the United States toward developing regions with under explored areas, such as Africa, Canada, and the United States toward developing regions with under explored areas, such as Africa, Latin America, and the Pacific (Mineral Resources of Kazakhstan Magazine, 2000, Mining Journal, 2008, February 22).

Nowadays, about 50% of total exploration expenditures for metals have been spent in Latin America (which has maintained the lead position for the last five years, accounting for 38% of total outlays on base metals), Asia, and Africa. Copper was the first non-ferrous metal and the second only to gold in terms of money spent on exploration in the 1990s, i.e. from \$ 800.6 million spent on base metal exploration in 1999, \$ 460.1 million was directed to copper exploration (including copper-dominant polymetallic deposits). Even though there has been a serious decline in total exploration activity since 1997 (31% in 1998, 21% in 1999, and further 5% in 2000), Raw Materials Group forecasts that exploration expenditure in 2001 will rise again albeit only slowly (Mining Journals review, 2000. International Copper Study Group).

In the third stage of the evolution of capital investment mergers and acquisitions has recently become the most important. Latin America and South Africa were previously the primary regions for such investments. The highest financial expenditures in Latin America were recorded in the years just prior to 1998, when the growth trend was broken, and expenditures dropped from a few billion to less than half a billion dollars. Much of this money was shifted to South Africa, where financial expenditures reached over 7 billion that year, which is the highest amount ever spent in any one country in one year. In 1999 the capital moved again, this time to industrialized countries, and two significant transactions were noted: Grupo

Mexico bought Asarco, and Phephs Dodge bought Cyprus Amax, a particularly notable M&A story in 1999. Due to these two transactions, with a total combined value of \$ 4 billion, along with acquisitions by Anglo-American in Zambia and Congo, M&A expenditures in the copper industry reached record values (total value of M&A in copper industry amounted \$13.7 billion in 1994-2000. The M&A of base metal industry represents, however, a smaller and smaller fraction of the global M&A expenditure, where the merging high-tech companies are several times are larger than any mining ones (US Geological Survey 2001).

Among Central and Eastern European countries there has been no significant investment in copper mining, even if they showed significant increase of foreign direct investments, relatively high increase of Gross Domestic Product, and financial stabilization. The copper deposits are in Russia, Poland, Serbia and Montenegro, Romania and Bulgaria. The most important changes in the copper market in that region was the public sale trading of 200 million shares of common stock of KGHM Polska Mied SA, with a nominal value of 10 PLN (\$1 = 4.0 PLN in 2000-2001) each on June 5, 1997. The shares were distributed as follows:

.ca.30 million were offered domestically for both small investors (16 million) and large investors (14million);

.ca. 30 million (15% of total shares) were given free to 42,000 authorized employees (these shares could not be publicly traded for two years);

.ca. 35 million were purchased in the foreign tranche, for which 17 million Global Depository Receipts (GDR' s) were issued.

.ca. 105 million remained in the possession of Polish State Treasury (USGS. Minerals Yearbook 2004. Tin. <http://minerals.usgs.gov>. 2006).

These shares are listed on the Warsaw Stock Exchange, where the asking price on July10, 1997, was 23,50 PLN per share (the lowest price, 10,2 PLN, was noted on January 13, 1998, the highest 35.2 PLN on February 25, 2000). Currently, over 50% of KGHM' s shares are in private hands, with major shareholders including Bankers Trust, Emerging Markets Growth Fund Inc., and others (US Geological Survey 2001).

These ways of foreign investment influenced the ownership structure of copper producers. According to Swedish mining database Raw Materials Data,

the 10 largest companies now control the highest percentage of world copper mining production ever noted (46.7% in 1975, 50% in 1985, 57% in 1990, 52% in 1995, and 62.4% in 1999). In the period 1995-1999, Grupo Mexico SA de CV showed the highest increase in control of copper production (360%), followed by Phelps Dodge Corporation at 180%, and Codelco at 141%. Each of these three largest companies now controls over 1 million tpy of copper production, mainly from South and North America. The next four copper producers, which each control over 0.6 million tpy of copper, are Broken Hill Pty, Freeport McMoran, Rio Tinto plc, and Anglo American; these companies operate on virtually every continent (US Geological Survey, 2001. <http://minerals.usgs.gov>).

The high investment expenditures and ownership changes also resulted in increasing copper production volumes. In the period 1990-2000, the volume of copper mining on the world market exhibited an upward trend, increasing by 43%. The highest were noted in South America - 171% (mainly due to expanded copper mining in Chile), Asia - 101% (Indonesia, Kazakhstan, and China), and in Oceania - 90% (Australia, Papua New Guinea). Copper mining production from the South America amounted to 41% of world production in 2000, with 16% from Asia (US Geological Survey 2001).

<Table 1> Changes in world mining production in 1970 2000

Countries	1970 Mt	1980 Mt	1990 Mt	2000 Mt	1980/ 1970 %	1990/ 1980 %	2000/ 1990 %
Poland	70,8	363,2	329	480	413	10	46
Portugal	3,7	0,8	160	99	78	19900	31
F.Soviet Union	570	980	900	520	72	8	42
Europe	910	1746	1715	1320	92	2	23
South Africa	149	212	197	144	42	7	27
Zair	387	460	355	120	19	23	66
Zambia	684	96	496	260	13	17	48
Zimbabvwe	0	7	15	24	700	107	619
Africa	1303	1359	1131	520	4	17	54
Australia	158	243	325	760	54	34	132
Papua New Guinea	0	146	170	183	1460	16	7
Oceania	158	390	497	943	147	27	90

Argentina	0,1	0,2	0,3	210	100	50	69900
Chile	710	1068	1588	4500	50	49	183
Peru	220	367	317	530	67	14	67
South America	944	1440	1943	5240	52	35	171
Canada	610	716	793	650	17	11	18
Mexico	61	175	291	390	187	66	34
USA	1560	1181	1587	1450	24	34	8
North America	2246	2080	2671	2400	7	28	7
China	100	162	360	500	62	122	39
Indonesia	0	59	169	850	590	186	403
Asia	467	712	1055	2120	52	48	101
World total	6030	7728	9017	12900	28	17	43

(Source: US Geological Survey 2001)

The production increases in these two regions are the result not only of good utilization of resources, but even more of economic liberalisation, privatisation, and globalisation. As investments in these regions have been competitive on the global copper market (low cost of production), and there are still high potential reserves, the future primary copper supply would depend on the delivery from 3-5 countries.

<Table 2> Relation between reserves and the volume of Copper mine production

Countries	Mine production 2000 Mln. Tons	Reserves	Ratio in years
Australia	760	9000	11,8
Canada	650	10000	15,4
Chile	4500	88000	19,6
Indonesia	850	19000	22,4
USA	1450	45000	31,0
China	510	18000	35,3
Peru	530	19000	35,88
Kazakhstan	380	14000	36,8
Mexico	390	15000	3,5
Russia	520	20000	38,5
Zambia	260	12000	46,2
Other	1600	50000	31,3
Total	12400	319000	25,7

(US Geological Survey, 2001)

The significant structural changes that have taken place in the last decade on the world copper market have involved primarily the privatization of state-owned enterprises in many regions of the world and the increasing of major transnational corporations (globalization, internationalization). Some of these huge private companies could operate at a profit even when the copper prices reached their lowest post-war levels in real terms in 1998 (Boston Consulting Group, 1998).

This is partly the result of proper investment decisions, modern management, and the pressure of shareholders. Research by the Boston Consulting Group (1998) has shown that the average annual total shareholder return for the peer mining group amounted to 13% for the 10-year period ending in 1996.

This includes dividends paid plus capital growth, and this might have far reaching implications - if concentration through further M&A on the copper market in late increases, then the global copper market will become less competitive and could change into a semioligopoly, since the 10 largest companies already deliver nearly 70% of western copper production. Profitable companies which develop new mineral resources, or modernise existing facilities, or participate in the privatisation of existing mining industries, can provide an impetus for the acceleration of overall economic growth in the host country (Mineral resources of Kazakhstan, 2001. # 14/15. p. 6-11).

The primary impacts and benefits of mining include revenues and profits, employment, infrastructure, etc. For some countries, mining has provided a significant share of the Gross Domestic Product and export revenues (Commodity Markets, Nov 1999, World Bank).

In Chile, for example, mining accounted for 8% of the GDP and 50% of export revenues in 1997; in Zambia, 25% and 95% respectively. The most commodity-dependent and also the poorest region of the world is Sub-Saharan Africa. The dependence on a relatively small number of commodities in combination with low income makes these countries especially vulnerable in periods of low commodity market prices. The implications of such low price levels are more serious for commodity-dependent countries than other countries (Commodity Markets, 1999, World Bank).

The share of mining and quarrying in the GDP can be used to measure the significance of the mining industry in each country. It can be shown that for most important copper-producing countries, mainly from Latin America and China, there were increases in the GDP during the copper boom in 1995-97, and decreased or stagnated GDP during the recession on the copper market (Mineral resources of Kazakhstan, 2001. # 14/15. p. 6-11).

One of the more important economic factors influencing the competitiveness of copper producers is the exchange rate of national currencies against the US dollar. Since copper is most often traded internationally, and the contracts are usually drawn up in US dollars, the competitiveness of copper production in a given country improves with the devaluation of the local currency. The Indonesian currency crisis that began in July 1997 (a 57% annual inflation rate was noted in 1998, while the \$USA exchange rate amounted to 2909 rupiah in 1997, and 10013 in 1998) resulted in decreased production costs in \$USA terms. The average costs for labour and the purchase of local supplies normally represent 15-35% of cash operating costs (Mineral resources of Kazakhstan, 2001. # 14/15. p. 6-11).

The most important factor is tax level. Tax rates are usually established in the general taxation laws and the mining code (not by individual agreement). Generally, there has been a pronounced trend to liberalise fiscal regimes; many countries, for example, significantly reduced income taxes. Corporate taxes in the main copper producing countries may vary from 15% to 38%. Taxes in Brazil (15%), Chile (15%), Sweden (28%) are the lowest, whereas the rates in Australia (36% - the Australian government approved business taxation reform in the end of 1999) and Canada (38%) belong to the highest. However reduced income taxes may be insufficient to attract potential investors, since governments are collecting taxes in many other ways (royalty, environmental fee and fines). The most detailed comparison of taxes for the mining sector has been provided by the Colorado School of Mines. In order to compare the overall tax burden in one country to another, the authors have created a mine model that captures all cash inflows and outflows and then applies the tax system of different countries to the model (Commodity Markets, 1999, World Bank).

The IRR and NPV were calculated for hypothetical copper mines running

for 25 years, including the sum of all tax types. The comparison study for 25 countries proved that the highest IRR (after tax) could be achieved by investing in a hypothetical copper mine in Sweden, Chile, Argentina, the Philippines, or Kazakhstan. These countries, thanks to the liberalisation of tax regimes (among other factors) should be able to attract significant foreign investment inflow (Mineral resources of Kazakhstan, 2001. # 14/15. p. 6-11, www.metal.torg.ru).

Another factor which influences the economic environment for mine production is environmental regulations, which can render mining operations impossible, along with environmental user fees, which have a major impact on production costs. In 1997, for example, an agreement was signed to reduce greenhouse gas emissions in countries. The mining industries in these countries may have to carry the burden of higher energy prices (Mineral resources of Kazakhstan, 2001. # 14/15. p. 6-11. www.advis.ru).

The environmental issues are having an increasing impact on the mining industry, since many governments are stiffening their national environmental policy and introducing stricter environmental requirements. From the very beginning of the 1980s, the international copper market has been influenced by the rigorous environmental protection regulations introduced in many countries (Mining Journals Review, 2000, www.advis.ru).

For the copper industry, the most significant of these involve primarily mining and processing operations (the technological possibilities and costs of handling post-flotation wastes, release of salt water, etc.), as well as metallurgical operations (fees for emission of dusts and gases). For Polish copper producers, penalties and fees associated with polluting in the early 1990s reached as high as \$127 for every ton of copper produced (the largest burden was imposed by fees for storing post-flotation wastes). This was reduced to about \$50 per ton after pro-ecological capital improvements were made (www.kazakhmys.kz, Mineral resources of Kazakhstan, 2001. # 14/15. p. 6-11).

Globalisation in the mining industry is the result of several factors such as favourable government attitudes, political stability, new and more attractive national mining codes, and an internationally competitive tax system. Policies in many countries have been changed to attract investors. Among

industrialised countries Australia has approved a business taxation reform and the Scandinavian countries have opened up to foreign exploration (Mining Journals Review, 2000).

An optimistic prognosis for the economic growth of Central and Eastern European countries may well attract new investment in mining. There are some positive factors, such as good infrastructure and very well educated workers in Central Europe, but there are still many negatives, e.g. the recent changes in Russia in attitudes towards foreign investors, indicating that Russia's mining sector will be more and more closed to foreigners (Commodity Markets, 1999, World Bank).

Among the countries of interest in Central Asia, we may also mention Kazakhstan, with its largest copper producer Kazakhmys; another is China, where, according to the new Chinese mining code, foreign mining companies may acquire a 100% equity interest in non-diamond exploration concessions, which could lead to increased foreign exploration activity (Mineral resources of Kazakhstan, 2001. # 14/15. p. 6-11).

Presently foreign capital comes not only from highly industrialized countries, but also from such companies as KGHM Polska Mied SA, which are looking for new deposits abroad, and Codelco, which have started exploration activities abroad; for instance, a promising agreement with Grupo Penoles has allowed Codelco to explore for deposits in the Mexican State of Sonora, and to discuss with Anglo-American to explore in Zambia. These newcomers have only limited experience from investment overseas compared to producers with long established foreign operations (Mining Journals Review, 2000, www.kazzinc.com, www.mining.kz).

This increases their risks when investing abroad. To mitigate this increased risk they or concentrate on mergers and acquisitions with existing producers, choose countries and producers with low risks as partners or can rely on junior companies to explore for new deposits (Mineral resources of Kazakhstan, 2001. # 14/15. p. 27-30).

Among developing countries Chile, Peru, Brazil, and Argentina are at the top of the ratings for exploration investment based on their financial attractiveness, geological potential, property value, ease of doing business, and political stability. Countries such as Peru, Bolivia have been continuing

their privatisation to attract more investors, whereas Ecuador and Honduras have changed their mining law recently (Commodity Markets, 1999, World Bank).

Several countries, mainly from Africa, have recently altered their mining regimes and begun to attract many investors to their mineral industries (Mining Journals Review, 2000).

Roughly \$20 million was for example spent annually in the last several years for exploration in Zambia, by foreign companies (Mining Journals Review, 2000, www.kazzinc.com, www.mining.kz).

Even though, parts of Africa still remains a difficult investment environment for foreign companies, there have been several positive developments that could have a major impact on the region over the next few years. One such event is growth in exploration in both East and West Africa and the successful implementation of reforms in South Africa (www.mining.kz, Mining Journals Review, 2000).

With the final privatization of ZCCM the future of copper mining in Africa might hence become much more positive. On the other hand, there are still many countries which have not managed to implement policy reforms, and where political instability has increased. Civil wars and conflicts have interrupted mineral exploration in countries such as Angola, Congo, and Sudan (Mining Journals Review, 2000, www.kazzinc.com, www.mining.kz).

Chapter 2. Asia and Kazakhstan mining review

Asia is the world's largest iron ore consumer (50% of the world imports), while Japan (26, 8%), China (11, 5%) and the Republic of Korea are the main raw materials importers on Eurasia. Germany (10%) takes the first place among European countries importing iron - ore raw materials (Mineral Resources of Kazakhstan, 2000, Mineral Resources of Kazakhstan, 2001).

The economic crisis and damping pricing conditions on the world market for ferrous metals in 1997 - 1998 had a negative impact on the output of the Kazakhstan iron ore industry. Due to the reduced world steel and steel

products consumption, and the switch to domestic iron - ore raw materials by Russian metallurgist plants in 1998, Kazakhstan reduced production of iron ore by 29,2%, chrome iron ore by 10,8% and iron - ore pellets by more than twice. In 1999, Kazakhstan companies produced 9, 3016 million tones of iron ore, which was 2, 6 times less than in 1990. The economic crisis continued in the first six months of 1999, when ore production dropped by 53%, if we are compared to ore production for 1998, and pellet production declined by almost 90% (Mineral resources of Kazakhstan, 2000. 10/11. p. 46-50).

At present time, Kazakhstan is making radical changes in its approach towards economic evaluation of deposits and selection of priorities in geological exploration, general assessment of mineral and raw material sources. Kazakhstan' s balance of natural resources is being adjusted in accordance with strict economic criteria find international expertise in assessment of natural resources. Geological studies are being carried out, directed at finding scarce raw materials and developing priority raw material sources for the Kazakhstan economy (Mineral resources of Kazakhstan, 2001. # 14/15. p. 6-11).

The analysis of sources indicates that in general the country enjoys sufficient raw material resources, the development of which is profitable under current economic conditions. The additional zinc, lead and gold stocks obtained significantly exceed their production over the 10-year period. The supply of the manganese, chrome and iron ore industries with raw material has remained at a very high (for nearly 80 years), even though production output has increased by 1.5 times (Mineral resources of Kazakhstan, 2001. # 14/15. p. 8).

As a result of geological and economical reassessment, the reserves of 38 lead and zinc deposits have been classified as active (88.7% of total zinc reserves and 66.8% of lead reserves), in addition to 15 iron ore deposits (26.1% respectively), 46 copper deposits (58.8%), 90 gold deposits and 39 gold-containing complex ore deposits (86.0%). Mineral and raw material sources are being evaluated, primarily taking into account their sufficiency for current and future needs of Kazakhstan industry, and the opportunities for beneficial export of primary materials (Mineral resources of Kazakhstan,

2001. 14/15. p. 27).

CONCLUSION

The policies in many countries have been changed to attract investors, because the influence of globalization and world crisis. Globalization in mining industry is the result of several factors such as favorable government attitudes, political stability, the new and attractive national mining codes, and the internationally competitive tax system.

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