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Contents:

1. INTRODUCTION

The Soviet Union collapsed in 1991, and was divided into 15 sovereign states. A new independent country, Russia was born, and at the same time the whole societal system was changed. Russia started its journey from a socialist country with planned economy towards capitalism and market economy.

This report is about this journey. The subject of the article is the Russian Mining Industry, the RMI, which was privatised by the Yeltsin government in the beginning of 1990's. Before the privatizing was implemented the mining industry got its autonomy from the state, when the different mining ministries were abolished. During this "liberalisation" phase of transition the state still remained an official owner of the mining industry and its enterprises, but did not any more take care of the day-to-day business activities as was done by the six different mining ministries of the Soviet Union. Thus, during liberalisation mines were left a-drift alone without functioning governing system including financing or distribution from the government authorities as earlier. Both the mesostructure[2] of an industry and its market were destroyed.

The transition of the RMI continued after the liberalisation phase of transition. The privatizing of the industry followed, and after privatisation the new owners consolidated their mines into holding companies, which returned the power back to Moscow based holding companies. A new mesostructure of and industry was formed. In this report we are going to take a closer look, how the transition of the RMI took place.

In the beginning of the transition, the RMI was organised and it functioned according to Soviet traditions. The productivity of the Russian mines was far lower than their counterparts' in the Western countries. When a standard Western mine would have had 100 employees, the corresponding Russian mine with same production amount, according to empirical observations, would have from 300 to 500 employees. The productivity of a Western mine seemed to be at least three times the productivity of a

[2] Mesostructure is here defined to be an industry's overall governing system, between the enterprise and the government levels. A mesostructure describes the intermediate layers of power between the lowest layer and the highest layer of power between the participating actors in an industry.

Russian mine. In this report we are also going to take a closer look at the low productivity of the Russian mining industry and compare it in a benchmarking study to a Western mine.

This report consists of three parts: a comparison study of RMI's productivity, the transitional path of RMI, and the results of transition.

The study of productivity was made in 2001, the study of transitional development between 2003 and 2006. As a whole this report covers the developments of Russian mining industry from the beginning of the transition in 1990 till 2006.

The first study, study of productivity, was a benchmarking case study arranged to compare the Russian mines and Western mines in their productivity. The productivity study is presented in Chapter 2.

The transitional development of the RMI is presented in Chapter 3 of this report and the results of transition in Chapter 4.

Chapter 5 draws the conclusions of the previous chapters of this report.

2. PRODUCTIVITY OF RUSSIAN MINES

2.1. The work productivity defined

In general work productivity in transitional countries right after socialism was poor. For instance in 1996 the World Bank reported that one Ukrainian coal miner produces on average 112 tonnes of coal every year, one Russian coal miner 250 tonnes, one Polish coal miner 420 tonnes, one English coal miner 2,000 tonnes and one United States coal miner from 4,000 to 6,000 tonnes (World Bank, 1996). According to these figures the productivity of an American coal miner was 35 times the productivity of a Ukrainian coal miner five years after the beginning of the transition process.

The word "work productivity" can be defined in several ways. In this report work productivity is regarded as the ratio of enterprise output and input. (Rehnström, 1989 a

and b). The output is defined as the production of the mines in tonnes, and the input the number of employees in the mine.

The chosen ratio is meant to be simple. One reason for this is the methodological problem on transitional studies. First of all, the finding of facts and knowledge in Russia is difficult, and secondly the validity of the knowledge acquired is difficult to define (see for instance Liuhto & Michailova, 1999).

There have been some attempts to describe the productivity of work between industrialized Western countries and countries in transition. Some Russian researchers have come up with the estimate that productivity in Europe and the United States is two-threefold compared with Russia (Boiko et al., 1999).

Of course, there are differences in work productivity inside the industry branches of the transition countries. Former Norilsk Nickel executive, Johnson Khagazheev, wrote in December 2000, that the company he manages has 19 times the productivity of the average work productivity of Russia (Khagazheev, 2000).

It is worth noticing, that Khagazeev is comparing his own mines' productivity to the average productivity of work in Russian industries, but not to other mining companies in Russia and Western countries. We are going to return to this dilemma later on.

2.2. The work productivity in Russian mines

Norilsk Nickel is the largest producer of nickel in the whole world. During the default of the Russian rouble in 1998 the company was close to liquidation. In 1998 the top management of the company sent 10 of its best workers to Canada. Their task was to get acquainted with the mines of Norilsk Nickel's competitors, Inco and Falconbridge. After returning back home the delegates told their colleagues that the Canadian miners earn about 4,000 USD each month. During this time the Norilsk average salary was a couple of hundred dollars every month. The Norilsk combine manager, Khagazeev, told the worker delegation, that the salaries in Norilsk will be the same as in Canada, when the work productivity is the same. Three years later Norilsk Nickel is one of the richest and most profitable companies in Russia. It has started a modernisation programme worth hundreds of millions of dollars. Although they have not reached the productivity

of its Canadian rivals, there has been significant improvement. At the same time the salaries of the workers have risen to 700 dollars a month. The amount of workers has diminished, due to voluntary programmes, by 35,000 people[3] and the company is planning to diminish the personnel by 20,000 more. The main hindrance to the modernisation programme is regarded to be managers who received their education during the Soviet era (York, 2001)

Norilsk Nickel are going to improve work productivity further. Although there has been an improvement in work productivity, the modernisation programme of the mines is continuing as planned. The number of personnel will be reduced in their mines and at the same time there will be an increase in work productivity.

According to an internal Norilsk Nickel study, their productivity is higher than in corresponding mines in Canada (Norilsk Nickel, 2001). This quite astonishing conclusion raises several questions. How are the work productivity figures calculated? How reliable are they? What generalisations can you make from them? How much more profitable is a Russian mine compared to its Western competitors?

2.3. The benchmarking study

To get some answers to these questions a comparison study between similar Russian and Western mines was made.

This comparison study was conducted in two mines, the first one in Russia, the second one in an industrialised country[4]. The mines chosen to do the benchmarking were similar in size, excavated the same metal and used approximately the same mining methods[5].

2.3.1. General info of the studied mines

The mines' initial data is presented in Table 1. General info about the compared mines.

[3] The total amount of personnel in the company was 70.000 in 2001.
[4] The identity is not revealed.
[5] Pulkkinen, 2001.

Table 1. General info about the compared mines

	Russian mine	Western mine
Production	1,5 Mt/year	1,3 Mt/year
Ore type	Sulffide ore	Sulffide ore
Metals	Copper, zinc	Copper, zinc
	Metal content in one tonne of ore	Metal content in one tonne of ore
Copper	1 %	1,1 %
Zinc	4 %	2,1 %

Source: Kärnä, 2001.

The mines are about the same size, producing both approximate one and half million tonnes of ore per year, and they produce the same metals (copper and zinc) and the content of metal in the ore is quite similar. For both of them copper is the main metal produced. Based on these figures the mines are comparable in size, and can be benchmarked for work productivity (Kärnä, 2001).

2.3.2. The work productivity in benchmarking companies

The work productivity of the compared mines is presented in

Table 2. **Work** productivity in the **compared mines**.

Table 2. Work productivity in the compared mines

	Russia	Western mine	
Work productivity	1,500	5,078	Tonnes/person/year/whole personnel/year/mine
	2,206	11,818	Tonnes/person/year/mining personnel/year/mine
Personnel			
-total in company	1,000	256	
-in mining depart.	680	110	
-in central administration	95	0	

Source: Kärnä, 2001.

The overall work productivity in a western mine was threefold when comparing the whole personnel of the mine, and five times when comparing the number of workers in the mines themselves (Kärnä, 2001).

There were 1,000 people working in the Russian mine, 256 in the Western mine. In the mine itself excluding the crusher and concentrator there were 680 people in the Russian mine and 110 in the Western mine (Kärnä, 2001).

The main difference in the companies was the central administration of the Russian mine, which consisted of 95 people, who took care of administration at the mine. In the Western mine such an administration was totally missing; its tasks were run by the mine's management (Kärnä, 2001).

2.3.3. The production method and equipment

The production method in both compared mines was sub-level stoping. The stopes were backfilled with a mixture made out of concrete. The method at both mines was the same and it cannot explain the difference in work productivity (Kärnä, 2001).

Also the production equipment was similar, and partly supplied by the same company (Sandvik Tamrock). The production equipment of the Russian mine is presented below:
1 Cabolt 695, 1 Minibur S200, 2 Boomer 128 (Atlas Copco, Sweden), 1 Solo 1020, 2 Solo 1008, 1 Solo 605, 1 NKR-100 (Russia), 2 Toro 501, 2 Toro 1400, 1 Toro 40, 2 Toro 35, 6 MOAZ (Russia), 1 Charmec (Normet, Finland), Rammer E68 + boom, 1 Raise Boring gear (Ukraine). Additional purchases in 2001 were: 1 Toro 40, 3 Minibur and 1 Rammer E68 + boom[6] (Kärnä, 2001).

The Western mines main production equipment consisted of: 1 Robolt 320, 1 Robolt TPA-90, 1 Cabolt H, 1 Cabolt 530, 1 Para 305, 1 Axera 305, 2 Paramatic 305, 1 Solo H890RF, 1 Solo H689, 1 Solo 506 RTS, 1 Secondary drilling rig, 2 Toro 0011, 8 Toro 500, 4 Toro 40D, 2 Charmec (Normet), 1 Shotcreter (Normet), 1 road grader, 1 Toro 500 + Rammer S86, 2 Solo 1020, 17 Toyota pick-ups[7] (Kärnä, 2001).

The list of main equipment was very similar in both mines. They had about the same quality and amount of tunnelling drilling rigs, long hole drilling rigs, and auxiliary

[6] If not mentioned the producer of equipment is Sandvik Tamrock Finland.
[7] If not mentioned the producer of equipment is Sandvik Tamrock Finland.

equipment for shotcreting and charging. The same applies to their loading and hauling equipment. It can be said that the Western mine was a little bit more mechanized, but that was not regarded as bringing significant differences to the work's productivity (Pulkkinen, 2001).

2.3.4. Production overheads

During the comparison date the production cost of one excavated ore tonne was in Russia 7 USD and 20 USD in the Western mine. Thus, the production costs in Russia were about one third of the production costs of the Western mine.

The comparison figures concern only the cost of excavating one ore tonne. In the production scheme of these mines the ore goes on to be crushed and enriched. The mine sales product in both cases is copper and zinc concentrate, which is further processed in a smelter.

The research failed to discover the production costs of the Russian concentrate. However, in the Western countries the cost of enrichment was about half of the excavation costs. Thus, if the Western mine's excavation costs were about 20 USD/tonne, then the costs for crushing and enrichment would be about 10 USD/tonne. If the same applies to the Russian crushing and enrichment costs, then the comparative cost in Russia for crushing and enrichment would be 3,5 USD/tonne (Kärnä, 2001).

2.3.5. Conclusions

Norilsk Nickel has made an internal study (Norilsk Nickel, 2001), which seems to suggest that work productivity in Russia would be higher than in Canada. The results of the comparative benchmarking seem to indicate that the situation is not so.

When talking about Norilsk Nickel we have to note that this company is one of the largest mining companies in the whole world. This company also had some special rights during the Soviet era to purchase Western mining equipment with hard currency, which was not available to other mining enterprises. Norilsk Nickel had better and more modern equipment than the Russian mines have on average, which were forced to use Soviet made equipment and very often non-mechanised equipment (Pulkkinen, 2001).

However, Norilsk Nickel has started a modernisation programme. This seems to suggest that the top management is not happy with the current work productivity.

The anonymous Russian company in this study is, based on the quality of equipment, comparable to Norilsk mines. The mine is modern and the equipment similar, but its work productivity is worse than in Norilsk. According to expert opinion the Russian mine studied represents a better than average Russian mine and its work productivity is higher than the average for Russia (Pulkkinen, 2001).

The results of this comparison strongly indicate that the work productivity of Russian mines is lower than in Western mines. The results support earlier research that productivity in Western countries is two to three times higher than it is in Russia (Boiko et al. 1999).

However, an astonishing dilemma was discovered: if the production equipment of the compared mines is about the same, what is then the reason for lower productivity? Is the difference in the organisational effectiveness? Are the Russian mines still using the old Soviet organisational practices, which make them less productive than their Western counterparts?

3. TRANSITION OF RUSSIAN MINING INDUSTRY (RMI)

3.1. The development of RMI during Soviet era

The mining industry was an important part of the Russian economy long before the communist revolution in October (November) 1917 (see Malyhin, 2000 and Bakka & Ilichenko, 1995). Imperial Russia was one of the world's largest producers and exporters of iron, and other metals. It is interesting to note that the mining industry had been both a government and private owned industry during the Tsarist era. By Tsar Peter the Great's imperial decree from 1739 state owned mines were banned, and all state owned mines were transferred to private ownership. Later on, this decree was cancelled, and the state once again started to exploit new mines (Malyhin, 2000). Thus, the RMI had been both privatised and nationalised before the 20th century.

Karnouhov divides the developments of the RMI during the Soviet Era into seven different phases. These phases are presented in Table 3. The phases of the development of the Soviet & Russian mining industry as follows:

Table 3. The phases of the development of the Soviet & Russian mining industry

1917 – 1920	War and early communist period
1920 – 1928	New Economy Policy period
1928 -1940	Collectivisation period
1940 – 1945	World War II period
1945 – 1985	Re-construction period
1985 – 1990	Perestroika period
1990 →	Transition period

Source: Karnauhov, 2004.

The Soviet era meant a lot of changes to the RMI. Firstly, the enterprises owned by private citizens were nationalised during Stalin's collectivisation period, and a large number of new state owned mining enterprises were founded. In many cases the original working force for these new mines were prisoners of Stalin's Gulag –system, because the mines were grounded in remote arctic areas of Northern Russia or Siberia. All mines were subordinates to central production ministries in Moscow. The whole country was run according to Stalin's administrative-command system.

In implementing Stalin's administrative-command system the Soviet state got involved in running the different industrial branches of the country. The administrative-command economy can be organised, as historical experience has shown, either by industrial branch or by region (Gregory, 2003). Throughout most of Soviet history, the industrial-branch principle prevailed. Orders for production and delivery of output originated in industrial ministries and in their branches' main administrations. The 1930's began with one industrial ministry, the Supreme Council of the National Economy, and ended with twenty-two industrial ministries in 1941 (ibid). The Supreme Council of the National Economy was split up into three industrial ministries in 1932; those were: the Ministry of Heavy Industry, the Ministry of Light Industry and the Ministry of Forestry Products. The Ministry of Heavy Industry (NKTP) was also responsible for metal production, and the main Administration of Metals Industry (Gump) was formed already in 1931 "for the strengthening of the economic and technical management of the metallurgical industry". Gump's formal report of June 1933 simply declared it was responsible for plan fulfilment and technical management ("extracting optimal indicators") of enterprises producing ferrous metals, iron ore, coke-chemical and fired bricks (ibid).

In the internal structure of a production ministry production was arranged either according to the mineral excavated or the region where the excavation took place. For instance, the Ural iron ore production was arranged at a regional base; the “Uralruda” regional production trust ran iron ore production in the Ural region. The management of “Uralruda” reported to a Moscow based all-union production entity for the whole country’s iron ore production. In the non-ferrous ministry the “Sojuznikel” all-union production entity was responsible for the whole nickel production of the country. Thus, the management of Norilsk Nickel reported to the head of “Sojuznikel” (Galchenko, 1999). The same applied for all other producers of nickel in the Soviet Union. Furthermore, the nickel smelters and other factories producing feinstein, nickel slabs and other products were in the same “Sojuznickel” organisation meaning that production was arranged according to the vertical integration principle (ibid). The same method was used by Finland’s Outokumpu Oy in the 1980’s, when they wanted to explain how they were producing both raw material and end products (see Kuisma, 1985)[8].

Before Gorbachev’s Perestroika policy the Soviet mining industry was managed by several industrial branch ministries. The main mining ministries were: the Ministry of Ferrous Metallurgy for the Production of Ferrous Metals, the Ministry of Non-Ferrous Metallurgy for Non-Ferrous metals, the Ministry of Medium-Heavy Machine Building for Uranium Production, the Ministry for Fertilisers, which oversaw the excavation of phosphates and other minerals to be used in soil fertilisation, the Ministry of Construction Materials, which took care of the production of aggregates, stone blocks and other construction materials, and the Ministry of Coal Production (Gondusov, 1999). In accordance with Figure 1: The mesostructure of the Soviet mining industry at the end of the 1980’s (Gondusov, 1999) the structure of the mining industry at the beginning of Gorbachev transition policy is presented. Note that all six ministries had similar internal structures.

[8] Today, Outokumpu has abandoned the vertical integration strategy, and concentrates only on the smelting and rolling of stainless steel sheets and the developing and marketing of technology (see internet site: www.outokumpu.com).

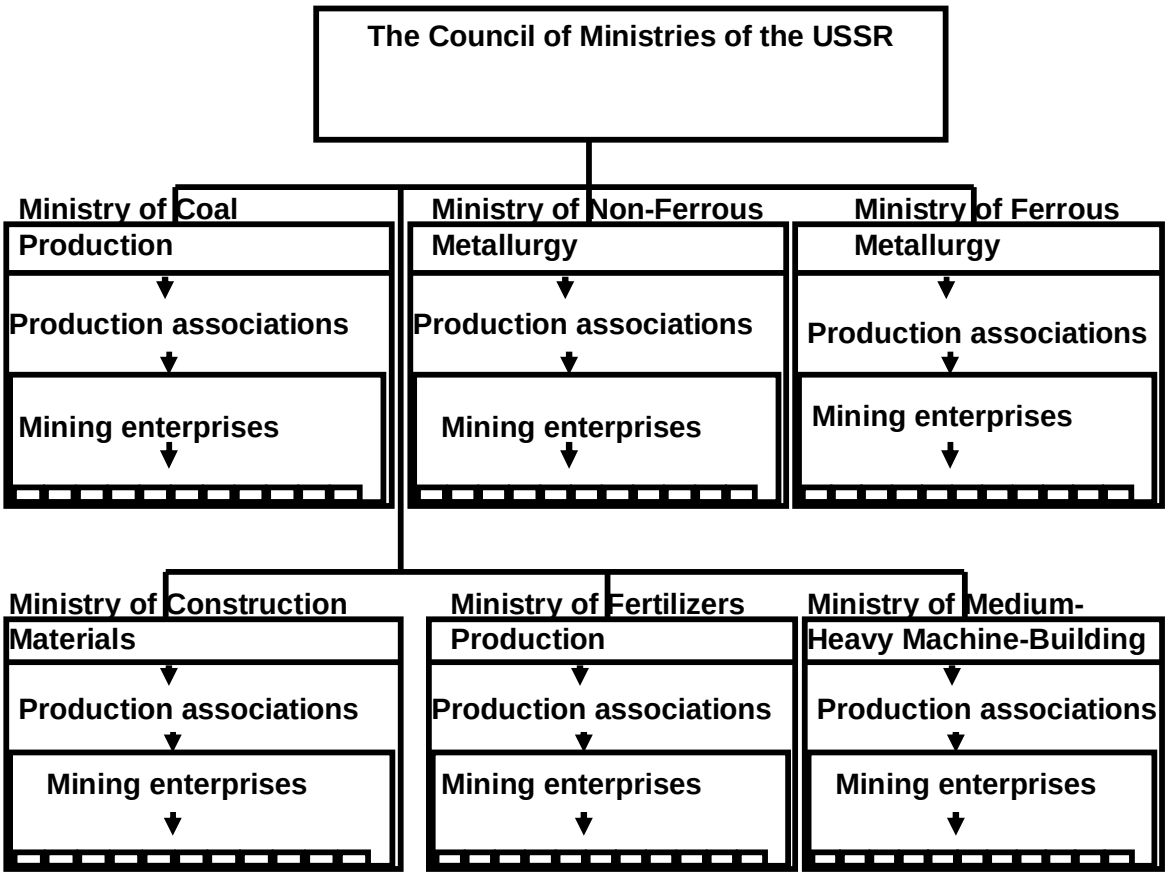

Figure 1: The mesostructure of the Soviet mining industry at the end of the 1980's (Source, Gondusov, 1999)

All the ministries of the Soviet Union were subordinate to the Council of Ministries, and Gosplan, the country's planning organisation, co-ordinated their production. All the different ministries of mining were organised according to the principle of vertical integration (Gondusov, 1999).

Vertical integration meant that all of the minerals and metal ores of the whole country were produced so that one ministry was in control of one metal's production. Thus, the Ministry of Non-Ferrous Metallurgy was in charge of excavating all copper ore in the Soviet Union, as well as its subsequent processing into final products like slabs, tubes, strips etc. The production system was monopolistic (Galchenko, 1999).

The Soviet mining industry was also arranged according to the principle of horizontal integration, meaning that all enterprises on the same level of the value chain were owned by the state, and that there was no competition between the different producers of metals or minerals. Thus, there were no secrets between the enterprises, and all

production methods and practices in-between the enterprises were similar (Gondusov, 1999).

The policy of Perestroika from 1985 gave more authority to enterprises, and reduced the power of bureaucracy (Gregory, 2003). Gorbachev's government undertook two changes that, in effect, destroyed the planned economy system. The landmark enterprise law of July 1987 freed enterprises from ministry tutelage, although some administrative controls remained. With the passage of enterprise law, the industrial ministries and regional authorities no longer controlled enterprises. The end of the leading role of the Communist Party dates to the Politburo's September 1988 resolution eliminating the sectoral departments of the Central Committee and the "*divorcing of the party from the economy*" (ibid).

The two pillars of administrative allocation, the tutelage of enterprises by ministries and interventions by party officials, were liquidated without creating an alternative allocation mechanism. Prices were set by state agencies; property was still owned by the state. Gorbachev created the worst of all worlds – a headless monster without direction left to stumble around on its own – without the ministry or the market. The economy went into free fall (Gregory, 2003). This, on the other hand, could be seen as the jolt which started the de-institutionalisation of the old structure of society.

In consequence, the earlier highly institutionalised Soviet society became less normatively institutionalised due to absence of governmental guidance.

In this report the focus is on the transition period, during which, according to Karnouhov (2004), a new way of taking care of the industry began. Unfortunately, and especially during the first half of this phase, this meant also a lot of destruction in the RMI.

3.2. Phases of transition

The initial situation in the RMI right after the collapse of Soviet Union was similar to other Russian industries; the whole industry was centrally led just like all other Soviet industry branches. All of the mines and metallurgical factories in the Soviet Union were

owned by the state. The production ministries were at the same time the central management and acted as the owners of the mines (cf. Fortescue, 1992).

The phases of the transitional development of the RMI from 1990 onwards identified in this article are: autonomy, privatisation and consolidation. Autonomy is regarded as comprising the Russian liberalisation and stabilisation phases of transition together with the preceding privatisation. Privatisation period is self-explanatory; it is the phase in the early 1990's when Russian enterprises were privatised. The third transitional phase, consolidation, is regarded as the post-privatisation phase of transition, when Russian industry was grouped into larger entities.

The phases of transition are presented in a time line in the following Figure 2. Phases of transition in a time line

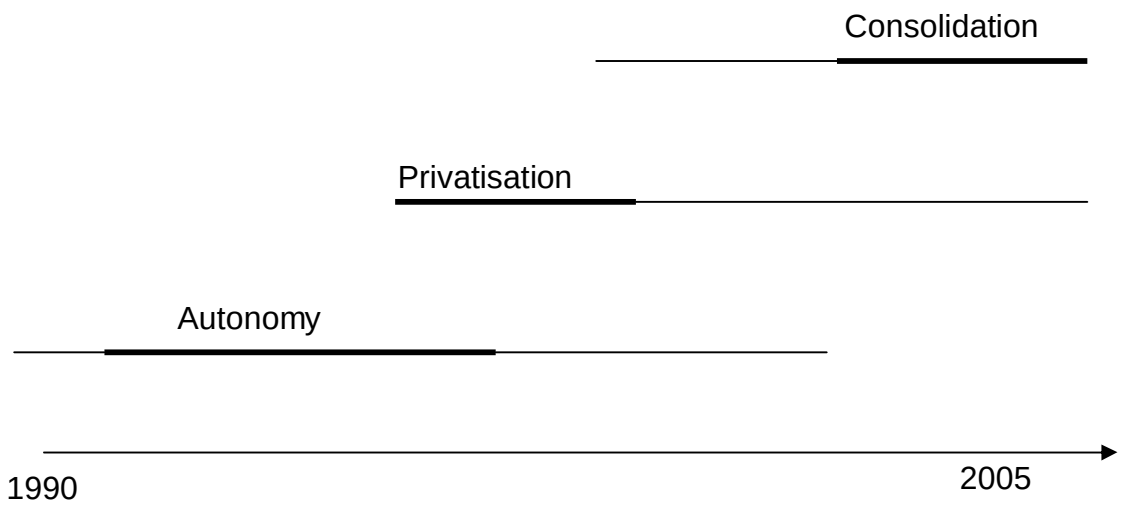

Figure 2. Phases of transition in a time line

3.2.1. Autonomy phase of transition

The autonomy phase took place from 1990 until about 1994. Starting already in Gorbachev's time and continuing during Yeltsin's liberalisation period the Soviet ministerial structure was turned around, and all previous mining ministries were abolished. This era is characterized by the weak and passive ownership of the state through regional property committees. During this time the mining companies for instance received the possibility to independently buy materials and equipment abroad. In some instances they had to also purchase consumer goods for the personnel because of lacking functioning of the market.

In a way the autonomy phase described here includes the norm “khozrachet”, which was introduced by the Gorbachev government in the middle of 1980’s meaning de facto the autonomy of enterprises in the Soviet Union. During the “khozrachet” period in the USSR the enterprises were in spite of the “khozrachet” reporting to their respective production ministry, but after the abolition of the ministries they lost the connection to their peers, and were left alone to learn the ways of behaviour in new circumstances.

It could be added here that all of the above processes shown in Figure 2. Phases of transition in a time line are overlapping and continuous. Privatisation is still occurring in some parts of the mining industry, for instance in the Kuzbass area the local government is actively looking for new owners for old and unprofitable coal mines. The same thing applies to other CIS-countries, for instance Georgia, which announced its mining industry’s privatisation programme in autumn of 2005 (see Boldnisi, 2005). Furthermore, the privatisation process in Russia is not over. Russian regional property funds are offering their assets for buyers in auctions (see Interfax, 2005-01-28).

On the other hand there is some evidence that de-privatisation, or nationalisation as described above, has begun with the Yukos/Khodorkovski case. De facto, Yukos, a privately owned enterprise ended up in the hands of the government, and a fight for Alrosa’s shares is going on between the federal authorities and local Sakha republic’s government (see Interfax 9 September 2005). The Russian government seems to have plans to increase its shares in Alrosa, and possibly even make it the beginning of government mining dynasty. This dynasty could be enlarged by purchasing Norilsk Nickel (WPS, 2006).

3.2.2. Privatisation phase of transition

The privatisation phase is the period during which the mining industry’s enterprises were sold to its first private owners, in other words the mines got their first private owners instead of the government, which during Soviet era had owned all the mines. The new owners during this phase of transition could have been the management, the so called red managers, sometimes together with the personnel, or it might have been private businessmen or privatisation funds etc. or other outside owners of the industry.

Until privatisation the main trend in the RMI was to follow the traditions of the Soviet mining industry. The party organisation did not interfere with production as earlier, but the local regional authorities continued to work with the mines as they used to do during Soviet times. In many places today the local mining towns are totally dependant on the infrastructure of the mine. The mine is often the main employer of the people in the town, and at the same time the major donator to the local city budget. During Soviet times the town's power station, electricity plant, hospital and children's home might be run by the mine (Rutskoi, 2005).

The privatisation period, which started at the beginning of 1990 lasted until 1996, and up to the beginning of 1996 about 125,000 enterprises had been privatised (Klevtsov, 2004). The tempo of privatising the industry has diminished from the early days of privatisation, but even today privatisation still occurs. The main bulk of the Russian mining enterprises were already practically privatised before the year 2000 (Gondusov, 1999).

The privatisation of the RMI can be divided into two phases as follows: First order privatisation and second order privatisation. First order privatisation refers to the sale of the mine from the state to a private owner. Second order privatisation is the sale of the mine from the first order private owner to another private owner. The period of first order privatisation took place from 1992 to 1995 (especially before Yeltsin's re-election in 1995) and second order privatisation from 1995 onwards till today.

The privatisation of the RMI happened in several stages and according to different schemes. In many cases the personnel received privatisation vouchers or mine shares. The largest mining company of the country, Norilsk Nickel, was privatised in a scheme of shares matched against a loan. When the Russian government could not pay the loan, the Interros group took this mining giant under its control (Duncan, 2004).

In practice Interros bought the old Soyuznickel department of the Ministry of Non-Ferrous Metallurgy of Soviet Union along with Norilsk, Pechenganickel, Severonickel and other enterprises. The group that bought it had the old Soviet internal structure, and production was arranged according to the vertical integration model (Rutskoi, 2005, see also Rautio, 2003).

The ownership of the personnel in the mining companies in Russia, which they got through the voucher privatisation, can be regarded as a temporary phase of the privatisation process (Galchenko, 1999).

As a result of the privatisation phase of transition almost all Russian Mining enterprises had new private owners up to the end of the old millennium. There are still some government owned mines like Alrosa (diamonds) or Tvel (uranium). Some analysts have predicted that Alrosa is facing nationalization (Helmer, 2004) due to the increased buying of Alrosa shares by the Russian government (Prime-TASS, 2005)[9]. This increasing interest of the state in the mining industry can also be seen as an indication of a wish to return to the past Soviet structures. Today the Russian Federation owns 50% of the shares of Alrosa, which is a legal successor of the enterprises, organizations and divisions of **NPO Yakutalmaz** (former USSR state-owned diamond mining company); diamond sorting and marketing divisions of the State Committee for Precious Metals and Gemstones (Ministry of Finance of the Russian Federation); divisions of the **Almazjuvelirexport** Foreign Trade Association incorporated into its structure. Both Alrosa and Tvel are government run companies today.

3.2.3. Consolidation phase of transition

The third phase of transition, which has been identified in this study has been going on since the end of 1990s, and is the process of consolidation. The owners of the industry have started to enlarge their assets by purchasing new mines, and are consolidating them into mining houses. As a result, the once sporadic spread of hundreds of gold, diamond, precious stones, iron ore, and coal mines in the mining sector has been consolidated and is now dominated by dozen giant holdings, which have taken the role of previous mining ministries in the meso structure of Russian mining industry.

The remaining private owners of RMI are proceeding with the consolidation process (Gorelov, 2001). What is happening is that the first private owners of the mines are selling their property to large groups, concerns and holding companies, who are grouping their assets in mining companies within their current structures Most probably

[9] The Sakha republic and the Russian Federation governments have had disagreements about the ownership of Alrosa, but by the decision of The RF Supreme Arbitration Court approved on December 20, 2006, a reconciliation agreement, under which an increase in the share capital of ALROSA ensured that at least 50%, will belong to the Russian Federation, 32% to the Republic of Sakha (Yakutia) and 8% to the districts of the Diamond Province.

the consolidation will continue, for instance, more than 550 companies in Russia are involved in gold mining but only around 30 of them have today the capacity to produce more than one tonne a year of the precious metal (MosNews, 2005). In effect consolidation means the loss of autonomy for many Russian mines, which could run their businesses independently at the beginning of 1990's.

According to Boiko et al. (1999) the amount of private companies in the mining sector (coal, ferrous and non-ferrous metals) rose from 1028 in 1992 to 3337 in 1996. Privatisation increased the number of enterprises in Russia. When consolidation started that development moved in the opposite direction: For instance, SUEK, a major Russian holding company in mining business, is a creation of the acquisitions of more than 160 companies (Global Business Reports, 2005, 36). Thus, 160 private mines or mining enterprises have disappeared since the SUEK consolidations.

Similar development can be found in other branches of the industry. Both Gondusov and Makarov report on the increasing amount of both coal (Gondusov, 1999) and gold (Makarov, 2002) producing enterprises at the beginning of the transition and their diminishing trend as a consequence of consolidation during the second half of the 1990's.

3.2.4. Reform as a result of consolidation

Furthermore, as a result of the consolidation, new phases in the transition have been emerging: modernisation of the enterprises, organisational changes in the management systems of the mines and increased focus on environment among others.

For instance, Severstal has a strategic investment plan for Komiugol, their coal mining asset in Northern Russia for 10 years to come worth 1.3 billion euros. The price that the mining enterprise has to pay for this investment is that they have had to halve the personnel of the mines from 21,000 to 11,000 people. One can say that Severstal saved the mines, but lost a lot of human capital (Helsingin Sanomat, 2005).

There are also some visible signs of organisational changes starting to happen in the RMI. Norilsk Nickel was first to announce on September 8th, 2005 that it has launched a programme to reorganise its management structure and bring it in line with current requirements for the management of large-scale international corporations. The

company will be comprised of industrial sectors entrusted with significant powers within the framework of existing corporate standards and strategies (Norilsk Nickel, 2006b)

Furthermore, Norilsk Nickel has been awarded certificates for the development and implementation of its Integrated System of Quality Control and Environmental Management (ISQCEM) in accordance with international standards ISO 9001:2000 and ISO 14001:2004 in the area of "*Management of Production and Projects, Marketing and Delivery of Products (nickel, copper, cobalt, precious metals, sulphur, selenium and tellurium)*". The system is accredited by the international accreditation bodies UKAS (Great Britain) and Road voor Accreditatie (Netherlands) (Norilsk Nickel, 2006b).

Also, as a sign of internatiolization, some mining companies have started IPOs, initial public offerings, e.g. stock issue sales in foreign exchanges. Evrazholding was one of the first to plan to do that in London (Helmer, 2005). One of the reasons for such actions could be the fear following the Yukos case of the owners losing control of their assets to the Russian government. There are reports that the state is planning to increase its involvement in mining enterprises, and even reports about plans to nationalize the whole industry (Gornaya Promyshlennost, 2006).

Clearly, these changes are being made to improve the productivity of Russian mines.

4. RESULTS OF TRANSITION

4.1. Current structure of RMI

The consolidation process of the RMI has lead to its oligarchic ownership. The lion's share of the mining industry is now in the hands of a few business giants that are financially independent and ready for international cooperation in order to develop new, riskier mining projects in and outside the Russian territory (Global Business Reports, 2005). Such conglomerates are for instance Eurazholding, Severstal, Norilsk Nickel, Rusal, UMMC, out of which Norilsk Nickel controls the nickel production, Rusal the aluminium production, and UMMC the copper production together with Norilsk.

However, it is important to notice that the state is an important actor of the RMI. The government of Russian Federation still owns very important mining companies, for instance Alrosa (diamonds) and Tvel (uranium). There are also from time to time

rumours on the marketplace about the state's attempts to increase its ownership in Russian mining companies (Helmer, 2004 and WPS, 2006). Some analysts have noticed that together with Vladimis Putin's nostalgic longing to Soviet traditions, the security officers of earlier KGB, the siloviki, have seized power in the state owned companies, and their sometimes peculiar behaviour is a sign of their commitment to these power organs (Ikonen, 2007). Ikonen notes that according to the Economist newspaper the power organs can seize power in business enterprises, but they are poor company managers. It is feared that the dirty methods of the "siloviki" are driving away potential domestic and foreign investors.

Subsequently, the foreign owners of RMI are sparse. There are not many private foreign owners of Russian mines, but there seems to be a growing interest in Russian mining assets (Luciw, 2005). Earlier, there have been attempts in the world wide mining community to start mining businesses in Russia, but because of their negative experiences, there has been much caution when investing in the RMI (Helmer, 2004b).

The failures of Star Resources at Sukhoi Log, Pan American Silver at Dukat, Archangel Diamonds at the Grip pipe in the Verkhotina field (see Helmer, 2000), Celtic Resources at the Neshdaninskoye project in Yakutsk (Wade, 2002) and Norsk Hydro at the Rasvumchorrr mine in Kirovsk on the Kola Peninsula are not encouraging for the foreign mining companies, who basically are not afraid of the risk of mining in Russia, but of unfair treatment by Russian institutions towards foreigners (ibid).

There are, however, some successful foreign investments into Russia's mining industry. Such stories include Bema Gold at the Julietta mine, High River Gold in Buryatzoloto, Kinross Gold in Kubaka and Harmony Gold in Mnogovershinnoye (Wade, 2002). The Kubaka investment cost 250 million US dollars, and one of the major reasons for its success was the special ukaz by President Yeltsin, which gave the mine the possibility to sell its gold directly abroad, if Russian central bank reserves did not buy the gold produced by Kubaka (Koponen, 1999). The difference in organisational efficiency compared to Russian mining enterprises is significant as noticed by the Russian working on the mine. There are no endless cigarette smoking breaks at work as in Russian owned mines (ibid).

Investment has not been one way though as Russian companies have also begun their global advancement (see Liuhto, 2003). For instance Norilsk Nickel has bought

Stillwater palladium mine in the USA (Redman, 2003), and Gold Fields in South Africa (Aaltonen, 2004, Interfax 2005). The purpose of such purchases is not to protect Russian capital by moving it abroad, but to secure both distribution and supply systems to provide palladium to the U.S. auto industry and, thus, virtually control the world's palladium market (Bregman, 2003).

Furthermore, the new law on raw materials has boosted international co-operation within Russia. Norilsk Nickel and Rio Tinto, an international mining major, announced exploration and joint venture development in Russia in January, 2006. The companies signed a co-operation protocol establishing the formal terms governing the joint venture. The agreement entails the establishment of a joint venture exploration and development company, owned 51 per cent by Norilsk Nickel and 49 per cent by Rio Tinto. Initial exploration efforts will concentrate on opportunities in the Siberian and far-eastern federal districts of Russia (Norilsk Nickel, 2006a).

4.2. Two contrary directions of development

The ongoing consolidation of the private part of RMI is twofold; there are two directions which are contradictory (Butrin, 2004). The first direction is vertical integration as per the old Soviet system. A typical example of this would be the UMMC (Ural Metal and Metallurgy Complex) owned by the mining tycoon Iskander Muhamedov and his allies. UMMC is a vertically integrated business, where the mines owned by the group produce ore and/or concentrate for the smelters of UMMC, only. The slabs produced from the smelters are then used in the polyproducts production of UMMC. Mining is regarded as an intracompany source of raw materials for the group's own factories.

Another direction of the RMI is to regard mining as an independent raw materials business (Burtin, 2004). A typical example of this would be the Russian iron ore mining enterprises of Mihailovski and Lebedinski, who as privatised companies trade only with their own raw materials selling them to processing plants, which are owned by separate business groups. No vertical integration exists there.

The examples above are from non-ferrous and ferrous mining. There are similar examples within other mining branches. The dynamo of the coal industry's drive to independence, SUEK, now Baikal Coal, has kept its focus on mining activities not power generating, while its main rival RAO UES has both coal and power plants, and

uses vertical integration. The same applies to Severstal, who now own Komi Coal and several iron ore mines as well as steel factories, and use Komi Coal's coke coal in the group's production of steel (see Butrin, 2004 and Global Business Report, 2005).

Butrin states that the independent raw materials business has become the norm in other industries than non-ferrous, ferrous and coal mining industries (Butrin, 2004). He presents some examples from silver production (Polymetall) and the non-metallic mineral market (PIK-group). Furthermore, he points out that some companies having the vertically integrated structure as an axiom from Soviet times can have new mining projects, which are separated from that group's vertically integrated business structure. This is evident in SUAL's Srednetimanskoye bauxite project, production which SUAL are ready to sell to the group's external sources.

The Russian vertical integration holdings structure has not proved to be very effective (Butrin, 2004) and one can say that it is against the global practices of Western mining companies (Global Business Report, 2005). It is common practice in Western countries to concentrate on the core activity, and everybody prefers to outsource (ibid). The Russian mesostructure with vertical integration has a Soviet background, and the vertical integration model in use in Russia today is a very specific model of vertical integration (ibid).

The further development of the RMI is at the crossroads of these two directions. Most probably the increasing interest of Western mining companies in Russian mining assets will lead to a shift in the focus of the independence of mining as business.

4.3. Roots of vertical integration

The RMI has consolidated itself into groups of companies, and in many instances into groups of companies which are vertically integrated. These companies are quasi-monopolies such as Norilsk Nickel, which produce 60% of the country's copper and 95% of its nickel, Rusal 70% of all aluminium, and UMMC 35% of all copper (Global Business Report, 2005). They both excavate ore, as well as produce slabs from it. In some instances they have companies outside mining and metallurgy. Furthermore, there are virtually no longer any independent mines in Russia. Almost all of them are parts of bigger companies, usually holding companies.

There has also been a trend of vertical integration in other Russian industry branches e.g. in the car industry (Reers and Kumm, 2006), the carbon and graphite industry (Metal Bulletin, Jun 2005), natural gas (Quast and Locatelli, 1997), the petroleum industry (Nefte, 2003), the agricultural industry (Struck and Strubenhoff, 2003), and the agricultural products market (Serova and Khramova, 2001). This process has been favoured by the policy makers (Struck and Strubenhoff, 2003) and President Putin has declared that Russia needs more vertical integration and horizontal links between elements of the state (Voskoboinikova, 2003).

The roots of vertical integration in the Russian industrial structure are historical: The communist party planners of Soviet society had contradictory ideas about vertical integration during the decades of communist rule in Russia. In the 1930's vertical integration, which during that time was very typical in Western societies was seen by Russian planners as a source of technological backwardness (Silver, 1984). However, this approach was changed later on, and the Soviet firms came more and more to adopt an extreme degree of vertical integration that came to be called *universalism* (ibid). Universalism in practice meant that all the parts and components of the end-product of a firm were produced in-house. No sub-contracting plants existed (ibid).

Today's vertical integration has been formed in the latter half of the 1990's and the drivers of this change are twofold: industry-led or government-led integration (Lembruch, 2001). The industry-led integration has taken place on a formal level by conglomerates through backward or forward vertical integration[10]. The government-led vertical integration has stayed informal, and usually on the level of regional governments, where the politicians of a certain region have wanted to gain dominance over local industries. This government-led integration has also been called regional *feudalism* (ibid).

Sinelnikov (2005) presents a possible reason for vertical integration, when analyzing the situation of Russian stone block and tile production industry and its transition. He states that the old traditions are so rooted in the minds of the industry's executives, that

[10] Vertical integration can be seen as static or dynamic according to its nature (Punkka-Sihvonen, 2000). Static integration means the extent to which the enterprise engaged in in-house production. Dynamic vertical integration can be divided into two directions: backward integration moves toward the production supplies, and forward integration towards distribution (Wu, 1992).

they do not see any other possibility for the production arrangements than the production of the final end product, e.g. the tiles, not the stone blocks. According to their "taken-for-granted" beliefs only tile production can be profitable. Thus, they ignore the experience of some highly-industrialised countries such as Finland, Italy, Norway, Spain and Sweden, where block production is very profitable and there are numerous firms, which only produce the blocks, e.g. the raw material. These countries then export their blocks to countries, where other companies are producing the final end product, e.g. tiles for example the USA and Japan (ibid). Global Business report (2005) states that the vertical integration model in Russia has a Soviet background due to the fact that the processing plants were designed for specific types of raw material, which were produced in certain mines. Consequently, during consolidation the new owners wanted to merge together both the raw material mine and the processing plant, which could use the raw material coming from the mine in question (ibid).

A reason for vertical integration can also be uncertainty (Suominen, 1991). In Soviet Russia cooperation between different ministries and Glavks (main production administrations) proved to be so difficult that the different ministries started to become self-sufficient by means of vertical integration (Silver, 1984). Thus, they were avoiding the uncertainty that came with the malfunctioning of the planned economy. In a market economy vertical integration has been linked to oligopoly in the mesostructure of an industry.

Also, there are numerous politicians and political movements in Russia, who opposed the participation of Russia in global trade as a raw material producer (Institut, 2006). These organisations and individuals raised their voice against Russia becoming similar to Africa, a poor producer of raw material for Western countries. The Russians want to add value to their product in Russia before exporting the end product abroad.

4.4. Holding companies in Moscow

The privatised part of the RMI is now owned by new holding structures, which are mostly situated in Moscow. In a way these holding companies can be regarded as remnants of the past. As during the Soviet era when Soyuznikel ran the whole of the country's nickel production in a vertically integrated fashion, it is now Norilsk Nickel, which is doing the same. Power has returned to Moscow, because the key personnel of

these enterprises are located there, and they have the authority to sell the metals and buy equipment for them (Popov, 2005).

The consolidation process has affected the mines so that they are now parts of big companies, which control them from their head offices. The mines' role has diminished, and they employ a position of the production unit. The mines have lost their direct contacts with banks, insurance companies and other structures, and the holding company's head office has taken charge of such operations. Furthermore, the sales of ore and purchases of equipment have usually been transferred to the head office of the concern (Popov, 2005).

It is now the head office of the holding company that takes care of such operations (Fortescue and Rautio, 2005). The mine has close contacts with other mines belonging to the same holding, but not to other competing mines. The processing plants in its own holding company are its closest partners. The local authorities have also taken up a very important position in the organisational field for the mine in question.

4.5. Management companies

One interesting and very much Russian feature (accepted by the country's legislation) in today's mining industry in Russia is the use of so called management companies to run the business. These, so called UK's (Upralyayuschaya Kompaniya, Управляющая Компания, Management Companies) are legal companies, which do not own the mines reporting to them. The mines report to the UKs, which might own a mining licence, but the actual running of the mine is carried out by the mining complex, which is owned by an offshore company. This structure enables the owners of the mine to secure their ownership of the mine in case the government has ambitions to take over the mine from its Russian owners. The idea behind this kind of arrangement is that the UK is owned by private people, close to the owners of the mine. Under the law the responsibility for any errors by the management lies with the UK. Thus, if charged by the tax authorities the mine with its legal owners cannot be punished nor confiscated by the state; it stays under the control and ownership of the Russian businessmen behind the offshore companies. The UK's would bear the consequences of legal sentences. These structures started to appear at the time of Yukos court case (Subbotin, 2005). One example of a UK is the Rusal organisational structure (see Rusal, 2006).

Such a structure could be regarded as the owners' strategic attempt to oppose the dictate of the state, and guard against attempts of the state to nationalize the company as happened in the Yukos case. The formal structure of a UK is allowed in Russian legislation.

Figure 3. The management company's structure illustrates the structure of a UK company with regard to the owner of the mine, and to the mines themselves.

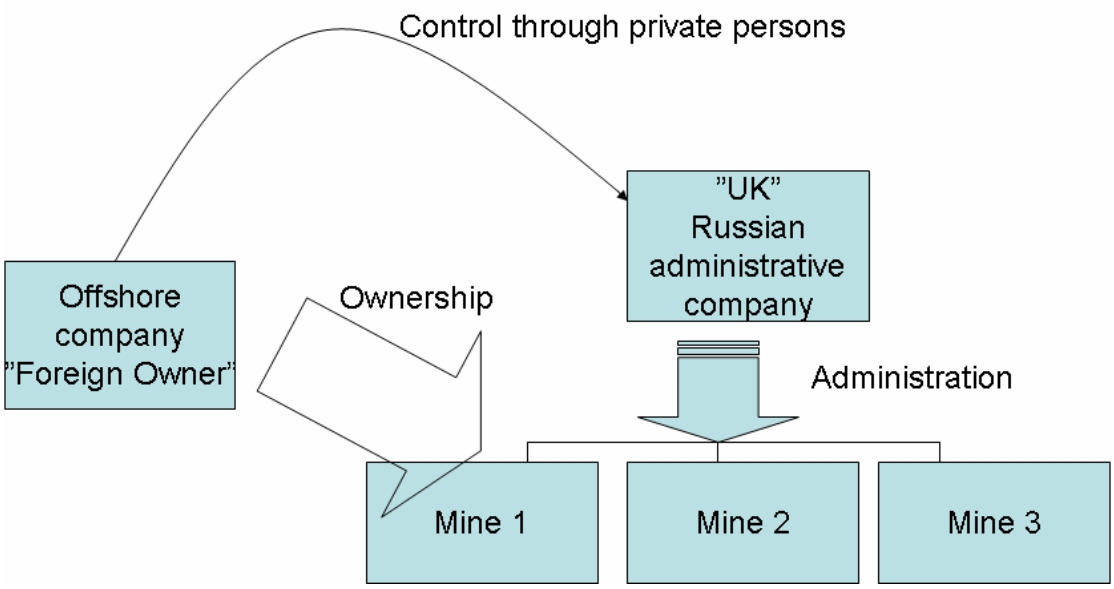

Figure 3. The management company's structure

4.6. Current trends in the Russian mining industry

Gilbertson has defined five current trends in the RMI as follows[11] (Tredway, 2005): renewal, consolidation, partnership, diversification, and international valuations. These trends, among others, will be discussed below.

The first of Gilbertson's five trends is renewal. According to Gilbertson, Russian companies are tightly held by a small number of shareholders that are all trying to build better and stronger enterprises. They recognize that many of the production facilities are old, and in need of upgrading and replacement to meet modern environmental and production efficiency standards (Treadway, 2005).

[11] Brian Gilbertson, President of Rusal, major Russian aluminium producer, and previous President and creator of BHB Billington, world's largest mining company.

The need for renewal is also stated by other Russian mining executives. When the researcher interviewed Oleg Mihailov, the general director of Karelsky Okatysh (iron ore producer in the Karelian Republic in the town of Kostomuksha), he noted that the Russian state finance default in 1998 sent the wrong signal to many enterprises because is gave them profitability on false pretences. Generally, there were no structural changes in the mining enterprises in the 1990s, and those changes should have been made at the end of 1990s when the mining enterprises experienced good profitability following the Russian rouble devaluation (Mihailov, 2001). Earlier in this thesis we have used the term modernisation to describe this phenomenon.

Second in the trends in Gilbertson's list is consolidation. There are major mining companies in Russia such as Norilsk and Rusal, but the consolidation process that characterized the emergence of the Western resource majors has yet to be played out (Treadway, 2005). In this study this trend has been identified to have started after the privatisation period of transition.

Partnerships is the third trend. Along with the almost signed memorandum of understanding, MoU, with Rusal, Gilbertson says the opportunity also exists for local or international partners in the new smelter project and other major ventures (Treadway, 2005). In particular, the law regarding mineral resources pushes foreign partners to cooperation with Russian mining companies (see Norilsk Nickel, 2006a).

The fourth trend is diversification. Ten to 15 years ago, large institutional investors in the West wanted "pure plays", or single commodity companies, and even single geography companies, from which the investor could mix and watch his ideal portfolio. Today, the global majors are all diversified by commodity and country (Treadway, 2005).

The final trend according to Gilbertson is international valuations. Often, assets that are not well known in the Western capital markets, particularly in developing countries, are accorded low valuations despite being of high quality (Treadway, 2005).

One may also note that Gilbertson, a foreigner, was the CEO of a Russian mining company[12]. Hiring foreign executives is quite a new phenomenon in the RMI, although this might cause unexpected difficulties for them as in the case when Western oil company's executives were regarded as spies, because they might have looked at oil field maps that are classified information according to Russian security officials (see Kaurala, 2005).

One peculiar aspect in the RMI's development trends was not mentioned by Gilbertson. That is the alliance of the mining business and local power structures. According to Delovoi Kuzbass magazine (2005) three mining enterprises of the Kuzbass region signed a cooperation agreement with the local regional (oblast) government in April, 2005. Yuzhkuzbassugol already signed this agreement for a second consecutive time with a regional government, and Sibuglemet with Raspadskaya ugolnaya kompaniya joined them. According to this agreement both the enterprises and the town, where the companies work will be developed according to agreed principles. Furthermore, before these companies a group of local companies had already signed similar cooperation agreements. According to Delovoi Kuzbass among them were: SUAL, Mechel, Kuzbassrazrezugol, Sibirsky Delovoi Soyuz, Severstalresurs, Prokopyevskygol and Belon, i.e. practically all the producers of coal in the region.

Similar information can be found in other regions. Interfax reports from Chita in April, 2005 that the administration of Russia's Chita region, which is home to the giant Udokan copper field, and Arctic mining and smelting giant Norilsk Nickel, had signed a cooperation agreement. Ravil Geniatulin, the region's governor, and Maxim Finsky, Norilsk Nickel's deputy CEO, signed the deal, which covers mineral development, the drafting of wide-ranging environmental programmes and the creation of favourable terms for attracting investments and putting them to effective use. Norilsk Nickel reiterated its willingness to provide financial support for social programmes in the Chita region and the region's administration pledged to monitor the use of the company's funds (Interfax, 2005c).

Both of these agreements reveal a very interesting state of affairs in Russia. Local regional governments use the RMI to pay off the social programmes the region cannot afford. In other words these are examples of the social responsibility of the RMI, often

[12] Gilbertson quit the Rusal job after the merger with Sual in February, 2007.

being the only local industry in remote locations with sustainable and constant profitability.

5. CONCLUSION

Based on the material presented in this report it is possible to say that the Russian mining industry has gone through an extraordinary transitional development from the collapse of Soviet Union till today, which results in the following:

1) Two contrary directions of structural transition

The mesostructure of the RMI is divided into two: the first is the vertical integration as per the old Soviet System. In this structure mining is regarded as an intracompany source of raw materials for the group's own factories. The mines are located lowest on the production chain, which aims to the production of finished products, not raw material.

A second mesostructure of the RMI is to have mining as an independent raw materials or commodity trade business. These privatised companies trade only with their own raw materials selling them to processing plants, which are owned by separate business groups. No vertical integration exists there.

However, in both cases the individual mines in the Russian periphery have lost their autonomy, and are now parts of larger holding companies.

2) Centralisation of power back to Moscow

Power has returned back to Moscow. Before the transitional period of Russian mining industry there were about 6 mining ministries, which were monopolies. The Yeltsin government privatised all the enterprises belonging to all of these ministries and thus, founded several hundreds, thousands of independent mining enterprises. These mines were running their own businesses based on autonomy and independence from the centre.

After 15 years of transition, the thousands of private mines in the Russian periphery are now parts of about a dozen mining conglomerates, which have taken the role of earlier Soviet branch ministries. The autonomy of the privatised mines has been liquidated, and the mines are now in the same position, in which they were before the privatisation. The key elements of a business entity are run by their head offices in Moscow (financing, sales, purchases, investments), and the mines have only a production unit status in their organisations.

It might be added here, that the siloviki have taken over the governmental sector of Russian mining industry. The siloviki are also located in Moscow, and the governmental mines are reporting to their own central offices there.

3) Re-appearance of Soviet structures

Old Soviet structures have re-appeared. Centralisation of power and the vertically integrated structures are examples of these. It can be also added that the model of vertical integration in Russia has proven to be not very effective. Furthermore, similarly to the Soviet Union, the local mining companies are taken care of the social welfare of the own regions. They are paying so called voluntary taxes to the local administrations' budgets in their hopes not to have problems with the local governor in the periphery, and his staff. The separation of the state from the economy has not taken place; although it was one of fundamental goals of transition (see Sutela, 2004).

4) Low productivity

The new owners of the RMI have made investments in order to streamline and modernise the old Soviet mines. In some cases this has not been enough to improve the profitability, because the old Soviet managers are partly still in power, and according to the benchmarking study presented in this report the essential problem of Russian mines' productivity lies in the management of the mines. Shortly put, the mines' central administrations are overcrowded. In order to improve the productivity the mining industry needs to remove the old Soviet era managers from power, and start to streamline the corporations' internal organisations. This might prove to be difficult to do, because the local governors' will not be happy about the increased unemployment rate in their regions.

5) Globalisation of mining business

The favourable trend of Russian mining industry has continued after the devaluation of Russian rouble in 1998. Since that the industry has had low production costs due to weak rouble. At the same time the increasing prices of metals have heightened the profitability of the mining business, and given the possibility for the Russian mines to start to acquire assets in other countries. The Russian mining enterprises have purchased mining companies in other CIS –countries and Western mining companies. The major mining companies have also penetrated the Western stock exchanges, and released through IPO's minor quantities of their shares to Western investors. Most probably the Russian mining companies will in the future continue their efforts to globalise their activities by acquiring mining assets in Western countries.

However, the Russian own mining industry is owned mainly by the domestic actors. Foreign companies have so far purchased minor mining companies, and they have been banned from big ventures. Foreign mining companies have not been allowed to purchase share in strategic mining companies. In order for a foreigner to participate in the mining business one would need a Russian partner, who owns more than 50% of the shares of the venture. It can be estimated that, if the Putin regime will be in power after the forthcoming Duma elections and the new president elected in spring of 2008 will continue the Putin policies in the mineral resources industry, the foreign companies will have only limited possibilities to become major players in the Russian mining industry.

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