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Anton Petunin

Determinants of capital expenditures: Evidence from oil and mining sectors in Russia

Examiner/Supervisor: Associate Professor, Sheraz Ahmed

Examiner: Professor, Mikael Collan

ABSTRACT

Author:	Anton Petunin
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This master's thesis investigates the significant macroeconomic and firm level determinants of CAPEX in Russian oil and mining sectors. It also studies the Russian oil and mining sectors, its development, characteristics and current situation.

The panel data methodology was implemented to identify the determinants of CAPEX in Russian oil and mining sectors and to test derived hypotheses. The core sample consists of annual financial data of 45 publicly listed Russian oil and mining sector companies. The timeframe of the thesis research is a six year period from 2007 to 2013.

The findings of the master's thesis have shown that Gross Sales, Return On Assets, Free Cash Flow and Long Term Debt are firm level performance variables along with Russian GDP, Export, Urals and the Reserve Fund are macroeconomic variables that determine the magnitude of new capital expenditures reported by publicly listed Russian oil and mining sector companies. These results are not controversial to the previous research paper, indeed they confirm them. Furthermore, the findings from the emerging countries, such as Malaysia, India and Portugal, are analogous to Russia. The empirical research is edifying and novel. Findings from this master's thesis are highly valuable for the scientific community, especially, for researchers who investigate the determinant of CAPEX in developing countries. Moreover, the results can be utilized as a cogent argument, when companies and investors are doing strategic decisions, considering the Russian oil and mining sectors.

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Anton Petunin

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ABBREVIATIONS

BCM = Billion Cubic Meters
CAGR =Compound Annual Growth Rate
CIS = Commonwealth of Independent States
FDI = Foreign Direct Investment
FCF = Free Cash Flow
GS = Growth Sales
LTD = Long Term Debt
MB = Million Barrels
MT = Million Tons
PSA = Product Sharing Agreement
ROA = Return on Assets
SME = Small and Medium Enterprise
TD = Total Dept
VAT = Value Added Tax

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1. INTRODUCTION

The necessity of capital expenditures for company value is broadly studied and well established in various academic spheres, such as economics, finance, accounting and etc. Capital expenditures are a critical component due to several reasons. At the macro level capital expenditures are a strategic element of country's gross domestic product, as described in all standard macroeconomic tractates. They maintain national's aggregate demand at a desirable level, foster economic growth and smoothen business cycles (Dornbusch and Fischer 1987). At the micro-level, capital expenditures cause effect on company's strategic decisions (Nicholson 1992) and production plans (Bromiley 1986). Capital expenditures also directly indicate company's performance (McConnell and Muscarella 1985).

Consequently, a large body of scientific research has endeavored best efforts to establish the determinants which explain the level of company's expenditures. The classic papers in this sphere include the tractate by Meyer and Kuh (1957), Dusenberry (1958), Kuh (1963), Jorgenson (1963), Siebert and Jorgenson (1968), Grabowski and Mueller (1972) and Elliot (1973). The significance of the issue and the controversial results of the early researchers have instigated a new round of the studies. The research papers by Nair (1979), Berndt, Fuss and Waverman (1980), Larcker (1983), Fazzari and Athey (1987), Fazzari, Hubbard and Petersen (1988), Waegelein (1988), Prucha and Madan (1989) and Gaver (1992) contributed to the research which is focused on the determinants of the company's capital expenditures.

Given the overall significance of capital expenditures, both macroeconomic and microeconomic levels, there are still unexplored issues and aspects in this scientific domain. The majority of studies are mainly focused on internal determinants of the company's capital expenditures, such as return on investment, cash flow and revenue (Fazzari, Hubbard and Petersen 1988; Gomes 2001; Mustapha and Chyi 2010). However, the role of macroeconomic indicators as the determinants of company's capital expenditures is still underexplored. Moreover, the previous research papers were mainly conducted in the developed countries, such as Japan, US and Canada (Larcker 1983; Waegelein 1988; Sanjai and Welch 1995). Only few authors carried out researches in the developing countries (Teplova 2007; Cherkasova and Smirnova 2012).

The findings of the previous research papers indicated a set of determinants of company's CAPEX. It was generally proved that the CAPEX directly correlates with company's cash flow (e.g., Fazzari, Hubbard and Petersen 1988; Sanjai and Welch 1995; Mustapha and Chyi 2010). The same interaction model can be identified among ROI, ROA and CAPEX (e.g., Gordon and lyengar 1995; Teplova 2007; Waegelein 2014). There were also scientific tractates examining the influence of financial leverage on CAPEX (e.g., Griner and Gordon 1995; Serrasqueiro, Mendes and Nunes 2000). However, the results were controversial in different countries and do not provide a clear model. The major determinants of CAPEX, such as, FCF, ROA and ROI cause the same effect as in the developed and developing countries.

The study object for this research was selected Russia, as the emerging market and due to its geopolitical role, raw-material appendage with the neighbors dependent on its extracted natural resources from West and interested to possess the territory from East. Importance of the mining sector in Russia is incontestable, the economic indexes, global ratings and Russian GDP, consisted almost half from the mining industry income easily can prove it. Russian mining sector is identified as the largest and the most profitable in the country, which is strategically important for further developments of other socio-economical sectors, this makes the mining industry of Russia attractive as a research target. By the reason of the enormous funding and investments required for the mining industry, what makes it easy to get wise the results from the model used in the study, consequently the demand of the research paper was satisfied.

The findings of our research is going to prove the previous scientist results (e.g., Gordon and lyengar 1995; Teplova 2007; Waegelein 2014). It is feasible to expect the outcome which is going to be contained within the preceding observations, due to the emerging country focus research. The new determinants of CAPEX can be discovered as the result of study, what can be determined by the pioneer research in this area under those circumstances. Therefore, the master's thesis makes a strong contribution to the scientific world in several ways. First, it assesses the determinants of CAPEX in the Russian oil and mining sectors which was never tested in the previous research papers. Second, it is the first research paper that tests CAPEX determinants at different levels: macro and company's levels.

1.1. Main objectives of the thesis

The master's thesis studies the internal and external determinants of company's capital expenditures from the period of 2007 – 2013 implementing the panel data methodology. The panel data methodology is the most accurate method, which estimates impact of independent variables on company's capital expenditures. The main goal of the thesis is to identify the significant macroeconomic and firm level determinants of CAPEX in Russian oil and mining sector. The relationship is studied based on six-year period. The set of questions will be covered in the thesis. This set includes the following questions:

1. What independent variables cause impact on the company's capital expenditures in the model with internal factors?

2. What independent variables cause impact on the company's capital expenditures in the model with external factors?

3. What are the firm level performance variables that determine the magnitude of new capital expenditures reported by publicly listed Russian oil and mining sector companies?

4. What are the macroeconomic indicators which determine the magnitude of new capital expenditures reported by publicly listed Russian oil and mining sector companies?

The full set of questions was covered utilizing the same Russian macroeconomic indicators, which cause the equal effect on the company's performance.

1.2. Limitations

In order to obtain relevant results and identify determinants of company's capital expenditures, the empirical part of the master's thesis was designed. However, the model has limitations and cannot provide overall situation in the Russian oil and mining industry.

The empirical part of the study is limited by time and comprises the period from 2007 to 2013. Based on previous research papers (Gomes 2001; Volchkova 2001; Alti 2003), positive correlation between company's capital expenditures and set of internal factors was detected only in stable business environment, excluding financial shocks and market volatility. In 2008 the financial crisis began in US and Europe, it provoked financial

instability and liquidity crises in the bank sphere. The overall financial environment deteriorated and demanded decisive actions from the global community. These dramatic events should be neglected during the evaluation process.

The time frame of the study is relatively small and embraces a six-year period. The following situation reflects the lack of financial data, which is essential for the calculation process. The close review of the Russian oil and mining sectors, its historical background and post period of the Soviet Union, depicted the following trends:

- The privatization of the major Russian oil companies was done with breach of legislation;

- During the 90s oil and mining companies were concerned with off-the book financial schemes, understate operational revenues and overstate expenditure;

- Russian oil and mining companies were exposed to frequent changes of ownership and legal statues;

- International accounting standards were established in small number of companies.

The data sample consists of leading companies; with large number of employees and strong political support, for example, more than 431,000 people were employed by Gazprom in 2013 (Oil and gas in Russia 2014). Consequently, the final results cannot be fully transferred to the whole set of companies, which operate in the Russian oil and mining sectors.

1.3. The thesis structure

The master's thesis consists of eight chapters. The first chapter is introduction and second chapter is designed to provide overall understanding of the Russian and oil and mining sectors. The third chapter provides a theoretical framework and literature review. The hypotheses and research questions are presented in the fourth chapter. The panel data methodology and thesis research are presented in the fifth chapter. The results of the empirical research are revised in the sixth chapter. The discussion is presented in the seventh chapter. The conclusion is presented in the eighth chapter.

2. RUSSIAN OIL AND MINING SECTORS

2.1. Oil and gas sectors in Russia

It is hard to overstate the significance of Russian gas and oil segments, both to global markets of hydrocarbon and Russian economy. Possessing 6% of confirmed global reserves of crude oil and 29% of gas, Russia has 9% of world crude oil exports and 29% of natural gas exports in 2014 (Arytunyan, Borisov and Beloglazova 2015). Nevertheless, Russian gas and oil sector faces a range of challenges, including a weak regulatory framework, low prices for domestic consumers, undeveloped transport system, low rate of investment, obsolete drill equipment and to cap it all, strained relations between Russian and the European Union, resulted in application of sanctions from the world community.

Over the last ten years Russia had a dramatic economic grow and political stability, with overall recovery in major economic sectors. In many aspects, the political and economic situation today demonstrates a weigh more eupeptic picture for stable development than in the beginning of the 90s (Hanson 2003). Nonetheless Russia has a range of serious obstacles in transferring present political and economic prosperity into long-term strategy within a sting rules-based, democratic nation and decentralized market economy (Shleifer and Treisman 2000). Highly centralized both regionally and sectorally, economic upsurge remains fragmentary and is generally based on high global oil indexes and remunerative price for the Russian export commodities. Russian regulatory environment causes a negative effect on small and medium enterprises, imposing unreasonable transaction costs (Pissarides, Singer and Svejnar 2003). Weak property rights and uncongenial business environment reduce the attractiveness of Russia for local and foreign investors in conjunction with capital flight. Finally, Russian export revenue is overly dependent on the natural resource sector, exposes the overall Russian economy to highly fluctuated global commodity prices (Cukrowski 2004).

The extractive industry, especially oil and gas sectors have a significant role in the Russian economy than in other countries. Gas and oil reserves are crucial for the overall Russian economy, as a main export item. The Russian Federal Budget heavily relies on oil and gas revenues. In 2014 more than a half of the Federal Budget was formed by the oil and gas revenue. The structure of the Russian Federal budget for 2014 is presented in the figure 1.

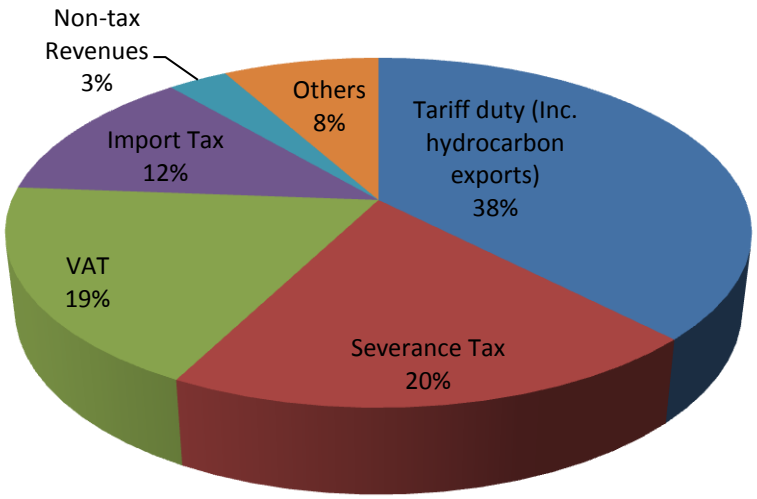


Figure 1. The Russian Federal Budget structure (Federal budget income behavior 2015)

Moreover, former Soviet Union countries, such as Ukraine and Belorussia, depend heavily on export of Russian hydrocarbon for their energy and fuel needs, which provides Russia with an advantageous position in the European region. In 2013 Ukraine reached consumption level of 50.3 BCM of natural gas, but 25.8 BCM was imported from Russia (Gas conflict 2014).

2.1.1 Production

Russia reached its peak volume of crude oil extraction of 570 MT in 1987 and then the production dramatically dropped to 301 MT in 1996, 52.9% of the peak extraction level. In the time period 1991-1994 oil production in Russia declined by around 15% annually Growth in crude oil extraction in 1997 was terminated in 1998 by the sharp fall in global oil prices and the Russian monetary crisis (Cukrowski 2004). Set of underlying economic, organizational and political problems associated with ongoing national transformation had a negative impact on the oil production. In particular, preposterous economic principles and standards prevent investment in drilling-out operation of new oil deposits. Moreover, oil corporations had compulsory commitments to long-term and large investment without predicted tax policies, workable and stable laws, and with strict restrictions on exports. Oil producers had transport restrictions and state limitations on export of crude oil (Magill 2005).

The early 1990s in Russia were characterized by a slump in demand of crude oil resulted in declining of production capacity, low rate of investments and suspension of production. The outdated oil equipment and low investments prevailing in extracting domain made the Russian conditions even worse. Almost 20 years enhances in crude oil production rested on the consolidation of old drilling method and extensive extraction technologies. In the aftermath of circumstances, the technical conditions of the drilling equipment and facilities have fallen below global drilling standards. It was observed that, during the period 1990-2000 year, only 14 percent of the drilling equipment and facilities used in the Russian gas and oil sector met the global standards. It is important to note that regardless of the spikes in oil and gas prices during 3 year period (1999-2002) provided oil corporations with huge revenues, providing them an opportunity to modernize and renovate the equipment and to commit unbeaten exploratory fields, advanced facilities aimed to enhance oil production were not embedded into oil production cycles (Rautava 2002).

The global conjuncture along with tax policy and customs policy influenced at the extraction oil level. Tendency of the production reduction which comes out in the beginning of the world financial crisis in 2008 was penetrated in 2009. Next two years represented as the gathering momentum of the oil production, as the result it reached the 505.2 MT in 2010. In 2011 oil production reached level of 511.4 MT and 518.1 MT in 2012. However the growth in the Siberian, Far East and Privolzhsky federal districts not just compensated the reduction in the Ural federal district, also assure accession. Begin real wide scale reclamation of the Far East and Yakutiya minefields. Bringing into the development of new minefields afford the extraction level came to the 62.9 MT in 2012, that 12.1% out of total oil extraction in the country. In 2013 growth rate remained at the 2012 years level and as the outcome was reached the maximum value 523.3MT during the post-Soviet period (Petroleum complex 2015).

The situation with refineries in Russia is relatively the same. In the beginning of the 90s oil products, such as gasoline, were produced by utilizing straight-run distillation methods, the technology with the lowest expenses and the simplest process cycle. The secondary processes and cracking methods were rarely used. As the result, heavy petroleum products, such as heating fuel, dominated as the major output of refineries in Russia. The refinery products had a low quality comparing to the global levels. On the whole, refineries in Russia, its capacity and technological methods required extensive upgrades (Cukrowski 2004).

The complexity index was introduced by W.L. Nelson in the yearly 60s. The Nelson's index measures the relative value of elements that perform refinery processes. The building expenses for a refinery unit can be calculated based on its upgrading capacity and crude. The index compares the relative costs of required upgrading elements, such as, catalytic reformer or fluid catalytic cracking to the cost of crude distillation unit. According to the Nelson multiply index, Russia was depicted at 3.7, comparing with U.S. – 9.5, Canada – 7.1, EU and Japan – 6.5. It means that the volume of secondary processes and the technical characteristics of Russian oil after refining procedures are relatively low and even do not exceed the overall world rate of 5.9 (Johnston 1996).

2.1.2 Structure of industry

In the USSR oil and gas production was centralized, pegged to strict planning system and conformed to state owners. The entire technology cycle was controlled by the state agencies, i.e. sales, transport, refining and extraction. Until the collapse of the Soviet Union, the structure of the oil production remained constant. In 1991 OAO Lukoil was established, it was the first vertically integrated company in Russia (Cukrowski 2004). In 1992 the Russian president issued a Decree No. 1403, which supported further creation and development of other vertically integrated entities and the whole oil industry in Russia. At that time, the joint-venture companies were established in the gas and oil sector. At the end of 1990th more than 40 joint-venture companies operate in the oil industry (Shleifer and Treisman 2000).

Since the 2000s Russian oil and gas sector has been reformed and represented by 13 vertically integrated companies. Two out of 13 companies are state-owned - Lukoil and Gazprom, totally 13 companies produce more than 88% of crude oil and refining of Russian oil sector. The rest 12% of total oil and gas production was shared between 113 small firms, including 8% of the oil and gas produced by the joint ventures. The gas sector is mostly controlled by the Gazprom, which accounts for 72% of domestic and 18% of world gas reserves (Maksimova 2014).

Today, the Russian gas and oil sector is instantiated by the existence of diversified and large international corporations with strong vertically integrated system of operations including marketing, refining, oil exploration, transportation and production. Such an integrated structure allows oil and gas companies to receive a competitive advantage from the scale of company's operations. Oil and gas industry is grouped into 2 major clusters:

downstream and upstream. The downstream cluster includes operations such as a distribution of oil products in terms of heating oil, raw material, fuel and refining for the petrochemical plants and industry. The upstream cluster includes operations such as an exploitation and exploration of natural gas and oil. The oil and gas companies may focus on a concrete sector or operate in both sectors in the same time (Oil and gas in Russia 2014).

2.1.3 Transport

The government and state authorities entirely control the pipeline system for crude and refining oil and operate as common transport carriers, providing support for all the oil companies. Two companies provide administrative support: Transneftprodukt is responsible for oil products and Transneft is responsible for crude oil pipelines (Cukrowski 2004). The privatization processes in Russia have no impact on these oil structures in the near future, the government retains major share of stocks. The Russian railway system generally transports refined oil products from oil and gas refineries, which are primary distribution, meanwhile the volume of shipped oil product by pipelines is relatively low and continually declining (Makarov and Likhachev 2002). Figure 2 presents Russian pipeline system with primarily oil and gas consumers.

Notes: Blue line – oil pipelines; Red line – gas pipelines; Red dash-line – priority gas pipelines, Black dash-line – halted gas pipelines.

Figure 2. Russian pipeline system (Aron 2013)

The pipeline system is mostly concentrated and developed in western part of Russia and referred to primarily gas and oil consumers in Europe. Major pipelines from eastern part of Russia are located at the border of Kazakhstan and Mongolia.

2.1.4 Prices

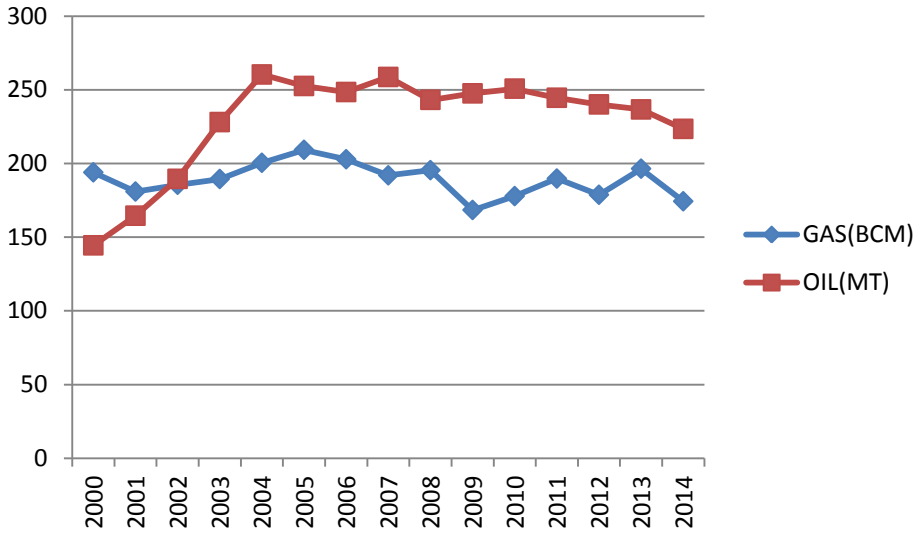
Russian government regulated domestic oil prices until 1995. At the first stage of Russian oil reform, the oil prices fluctuated according to the state setting and government restrictions, or by maximization of company's profits. Consequently, Russian domestic oil prices were comparatively below the global prices in terms of dollar. In 1994 Russian oil price achieved only 27% of the global crude oil price. Only at the end of 1995, Russian domestic oil prices start rapidly growth, associated with price liberalization, suspension of quotas and abolishment of licensing procedures. During the period 1996 –1997 Russian domestic oil had stable price at a rate of 63 dollar per ton, with an insignificant alteration in one dollar (60% of the global price). At the same time, petrol prices for domestic consumers achieved 75% of the global rate. However, in 1998, Russian economy was in a profound crisis, resulted in the devaluation of the home currency. The existed situation instigated sharp oil price declines to 15.5–16.0 dollar per ton in terms of dollar. In 1999-2000 Russian domestic oil prices were gradually growing, but still were comparatively low and achieved fewer than 33% of the global level. Therefore, Russian crude oil prices were liberalized in the same time period, but were not still sensitive towards global prices. The relatively low rate of domestic prices to some degree is a direct result of low oil exports, due to the obsolete equipment and limited capacity of pipelines and extinctive supply methods for the domestic customers (Cukrowski 2004).

Concerning recent years the alteration of the domestic oil price dynamically changed to be at the influence of the world crisis and fluctuated export tariff. Year 2007 shows the price level at 69.3 dollar per barrel. Against the backdrop 2008 was one of the weakest year regarding the domestic oil price for Russia, the prices were under 40 dollars point. It happened due to the middle of the world crisis. After 2011 the world situation started to revert to the previous conditions what triggered the world oil demand and reduction of the export tariff and put the oil prices to the 109.8 dollars per barrel. The tendency of the domestic prices of Russian oil reflects some changes; one of the reasons to it is the north stream exploitation, which gave additional revenues to the country (Russian Economy 2008-2013 2014).

2.1.5 Exports

A total net export of oil products and crude oil rose from 247 MT in 1990 to 276 MT in 2002 (oil products: 90 MT, crude oil 187 MT). As a consequence of a sharp decrease in domestic oil demand, from 270 MT in 1990 to 120 MT in 1999, the volume of exports expanded from 47.7% to 72.8% of aggregate oil production. Due to sharp decrease in oil consumption in the CIS and EU countries, exports of oil and gas were mainly focused on the countries of Western Europe. However, the total capacity of the Russian pipeline system was excessively low; such obstacles hampered oil exports and prevented a rapid development of the gas and oil sectors as a whole. In 1994 the Russian government established a new set of acts, which provided companies with equal rights and an access to gas and oil pipelines. Company's export duties were canceled in 1995 – 1996. However in 1999, export obligations were reinstated and indirect constraints on exports, through establishing volumes to be provided to the Russian customers, were established. Additionally, the Russian Federal government imposed new restrictions on oil exports, because it is way more profitable than Russian customers, which pay less price comparing to the world market participants (Cukrowski 2004).

Over the past 15 years the extraction of crude oil has been growing, placing Russia at the leading positions of the global oil producers. 488.6 MT was extracted in 2008, 494.3 MT in 2009, 505.2 MT in 2010 and 511.4 MT in 2011. Russian exports of crude oil and natural gas for the period 2000-2014, are presented in figure 3.



Notes: BCM - Billion cubic meters; MT- million tons

Figure 3. Export of hydrocarbons (Gas storage 2015; Export of crude oil by the Russian Federation for the 2000-2015 2015)

As presented in the figure above, the export of oil has a strong tendency to a stable growth, since 2004 oil export has almost doubled in comparison with 2000. Despite of the economic crisis, started in 2008, export of natural gas fluctuated only in the price range between 168.4 BCM to 209.2 BCM per year, which predetermined money supply of the Russian reserve fund. Since 2004 the export of Russian crude oil had a stable level of world demand, regardless of oil price spikes associated with the unstable world situation and series of local conflicts in the Middle East.

According to the Russian Ministry of Energy exported 235.0 MT of crude oil and 203.3 BCM of natural gas in 2013, with total export value more than 103.6 billion dollars. Figure 4 presents a pool of consumers of Russian hydrocarbons.

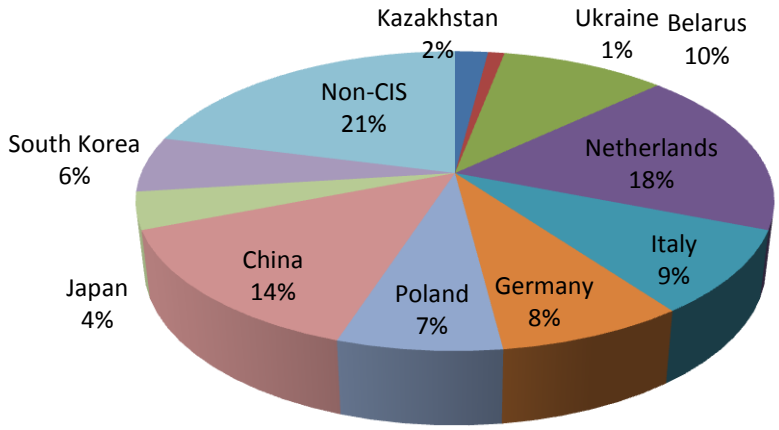


Figure 4. Consumers of crude oil and natural gas (Gas storage 2015; Petroleum complex 2015)

The Non-CIS countries, the Netherlands and China are the main consumers of Russian hydrocarbons. Since 2009 Russia has gradually increased an export of hydrocarbons to the Asian customers, by virtue of the new constructed pipeline systems, such as the Pacific Ocean and the Eastern Siberia pipelines. In 2013, Russia exported 3.1 MT to South Korea and 2.3 MT to Japan, making Asian market strategically important partner and new agreements with Chine's government are significant for further stable development.

2.1.6 Legislation

In 1992, the Subsoil Law was established as the main institutional reform, which provided a uniform set of policies and normative framework for the gas and oil industry in the Russian operation environment. At the beginning of 1995 the federal act “on PSA” was introduced, thereby the legal framework for PSA was established. The production sharing agreement is an agreement signed between an extracting company and the Russian government, concerning the amount of extracted recourses (oil, gas and etc.) for each party. Such contract provides major investors with consistent fiscal and legislative regimes over the period of live of a potential project. Russian fiscal and legislative environment was unstable in the early 90s, the production sharing agreements were a major instrument for attracting FDI in the gas and oil extracting sectors. However, a large amount of contiguous PSA federal policies were revised only in 1999, the Russian PSA legislation is party developed with defective interpretation of policies and laws. The absent of regulatory acts for PSA is the major obstacle restraining FDI and extraction growth. In fact, only three production sharing agreements were in statutory force: Kharyaginskoe, Sakhalin-1 and Sakhalin-2. All these agreements came into operation before the major PSA’s legislation was established (Cukrowski 2004).

Since the beginning of the 2000s the Russian Government settled a reformation plan, which focused on the domestic liberalization of the oil and gas sectors by 2010. The plan comprises three stages. The new system of access to the oil and gas pipeline transport network was established on the first stage. The oil and gas producers must receive equal access rights to the pipeline infrastructure. The hydrocarbons exchange markets were established, allowing large consumers directly cooperate with independent producers. In 2006 Gazprom made a pack with the Russian authorities, to let the prices evolve, with the goal from the authority’s side to enhance the domestic gas situation. Nevertheless, the independent gas and oil producers of Gazprom still do not have an equal access to the pipeline infrastructure. Later, the second stage of the reform plan, the production and transport operations within Gazprom must be separated in accordance with the federal law. The new entity, Gasprom subsidiary, is fully responsible for the oil and gas transportation. Finally, the last stage was established to lead to the overall domestic liberalization of the oil and gas sectors. However, the reformation plan will be completed only in 2015, due to consumer’s protests and social negative reactions to price rise (Russia Energy Report 2013).

In 2012, the Russian Government gas adopted a new tariff plan for entities that produce hard-to-recover reserves. The plan reduces export tariff by 10%, it will apply to bituminous oil, ultra-heavy oil and petroleum produced from the particular regions: Krasnoyarskiy Kray, Sakha Republic (Yakutiya), Nenetskiy Avtonomnyy Okrug and Irkutskaya Oblast', on the Yamal Peninsula and Caspian Sea and continental shelf of the Russian Federation. The Ministry of Economic Development expects that the new tariff for the bituminous and ultra-heavy oil would raise petroleum production by 100 MT per year (Orlov 2015).

2.1.7 Key financial statistics

Market value

The Russian gas and oil market has decreased by 1% in 2014 and reached level of $157.6 billion. During period from 2010 to 2014 Russian gas and oil market had a compound annual growth rate of 7.2%. Table 1 presents the annual market value for period 2010-2014 (Oil and gas in Russia 2014).

Table 1. Market value of Russian gas and oil sectors

Year	$ billion	% Growth
2010	119.2	
2011	159.2	33.5
2012	160.7	1.0
2013	159.2	-0.9
2014	157.6	-1.0

Market volume

The Russian gas and oil market has increased by 0.7% in 2014 and reached a volume of 3.825 MB. During the period from 2010 to 2014 the Russian gas and oil market had a compound annual growth rate by 1.4%. Table 2 presents the annual market volume for period 2010-2014 (Oil and gas in Russia 2014).

Table 2. Market volume of Russian gas and oil sectors

Year	Million barrels	% Growth
2010	3613.8	
2011	3720.2	2.9
2012	3766.0	1.2
2013	3798.2	0.9
2014	3825.0	0.7

Forecast of market value

In 2019 the Russian gas and oil market will reach a value of $121.9 billion, 22.7% decline since 2014. During the period from 2014 to 2019 the Russian gas and oil market a compound annual rate of change will be -5%. Table 3 presents the annual market value for period 2014-2019 (Oil and gas in Russia 2014).

Table 3. Market value forecast of Russian gas and oil sectors

Year	$ billion	% Growth
2014	157.6	-1.0
2015	120.2	-23.7
2016	121.3	0.9
2017	121.8	0.4
2018	123.0	1.0
2019	121.9	-0.9

Forecast of market volume

In 2019 the Russian gas and oil market will reach a volume of 4034.7 MB, 5.5% increase since 2014. During the period from 2014 to 2019 the Russian gas and oil market a compound annual growth rate will be 1.1%. Table 4 presents the annual market volume for period 2014-2019 (Oil and gas in Russia 2014).

Table 4. Market volume forecast of Russian gas and oil sectors

Year	Million barrels	% Growth
2014	3825.0	0.7
2015	3859.2	0.9
2016	3891.3	0.8
2017	3932.6	1.1
2018	3995.9	1.6
2019	4034.7	1.1

2.2. Mining sectors in Russia

According to the Ministry of Energy, Russia reached a level of 352.0 MT of coal production in 2013 (101.3 MT was produced by underground method and 250.7 MT was produced by surface mining). Russia has 376 BT of geologic reserves and more than 260 BT is economically recoverable, embedding 145 BT of lignite (Coal Mining Industry 2015). In the early 90s after the collapse of Soviet Union the situation in Russian mining sector was relatively similar to the oil and gas industry. During the period of Soviet Union, all metallurgical factories and mines were owned by the states. The Soviet Ministers were both the main control center and owner of the mines. The Ministry of Ferrous Metallurgy owned the iron ore mines; the Ministry of Non-Ferrous Metallurgy owned non-ferrous mines, the Coal ministry owned coal mines, the Ministry of Fertilizers owned phosphate mines and etc. The production structure was organized equally according to the region of excavation or the resource excavated (Puchkov 2015).

The Soviet Union established both vertical and horizontal integration systems, for example, the Ministry of Non-Ferrous Metallurgy was responsible for the production of all copper pipes and nickel slabs in the country. The competition between entities was eliminated as well as price fluctuation was strictly controlled by the state price committee. The company's management had no "room for maneuver" or minimal possibilities. During the period 1990-1996 more than 125000 enterprises were privatized, then the tempo of privatizing went down, but even now the privatization process takes place. The majority of Russian mining companies were partly or totally privatized in the begging of 2000th (Lieberman, Kessides and Gobbo 2007).

2.2.1 Production

Since the beginning of the 2000s Russian mining sectors demonstrate stability and a continued growth compared with the period after collapse of the Soviet Union. The Russian mining industry spreads across Asia and Europe. Nowadays, Russia is one of the largest mining countries, producing minerals such as platinum group metals (PGM), diamond, nickel, cobalt, bauxite, tin and coal. Russia dominates world production of PGM, mining more than 40% of world's palladium, 16% of platinum and 22% of world's cobalt and nickel output. It is one of the biggest diamond producers in the world (Russia Economy 2008-2013 2014).

In recent years the national coal mining industry has an explosive growth, due to the rapid development of the Russian economy. High oil and gas prices, the relatively low operating expenses of extracting most minerals, rise of the energy consumption and advantageous geopolitical environment to export to Asia and Europe - all these factors foster upturn in Russian mining industry. Table 5 presents the production of major mineral commodities in Russia (Safirova 2015).

Table 5. Production of mineral commodities in Russia

Commodity	2008	2009	2010	2011	2012
Diatomite	28000	30000	32000	33000	70000
Titanium sponge	347300	226000	265000	246000	420000
Ferrovanadium	120000	802000	135000	135000	125000
Ferronickel	179700	174800	197600	202000	233000
Antimony	35000	35000	60400	63480	73000
Platinum	27000	25900	25700	27300	30200

Notes: All numbers are presented in metric ton.

In 2012, Russia's production of diatomite grew by 113%, ferrovanadium, by 15.5%; ferronickel, by 15.3%; antimony, by 16% and platinum, by 10.7% compared with 2011.

2.2.2 Structure of industry

Russian mining sectors are quite complex, with giant size entities operating next to SME participants. After consolidation and privatization processes of the Russian mining sector has lead to oligarch's control. The major share of the mining sector is divided between a few business giants, who have financial independency and international partners, which provide technologies for perspective mining projects inside and outside the country. The major participants in Russian mining sector are presented in table 6 (Russia Mining Report Q2 2015 2015).

Table 6. Leading entities in Russian mining sector

Ferrous metals	***Non-Ferrous metals***	***Coal mining industry***	***Other mining sector***
EURASHOLDING	*RUSAL*	*SUEK*	*ALROSA*
THE MDM Group	*SUAL-Holding*	*Russian Coal*	*TVEL*
SEVERSTAL-INVEST	*METALLURG*	*RAO EES*	
The MECHEL Group	*Norilsk Nickel*		
UMC	*UMMC*		
UNICOR	*RMK*		

Russian mining sector is consolidated into clusters of companies, and in many operational processes into sub-groups of companies which have vertical integration. These companies can be characterizes as quasi-monopolists, for example, Norilsk Nickel, who produce 65% of Russian copper and 95% of national nickel, RUSAL 75% of total aluminum and UMMC 40% of all copper (Russian and CIS Mining Industry 2014). These companies both produce slabs and extract ore. The Russian government has relatively low level of shares, it controls milling companies and uranium mining through TVEL and diamond excavation through Alrosa (Danilov and Tarasov 2014).

At the beginning of 2013, Russia had more than 17300 companies engaged in quarrying and mining. In producing fuel minerals were engaged 7100 enterprises and producing nonfuel minerals were engaged rest of the enterprises – 10200 companies. Only 200 companies were controlled by the regional or federal government, 15300 were controlled by Russian citizens. Around 400 companies were governed by foreign owners or jointly

controlled by foreign and domestic companies (Main Indicators of Mining and Quarrying, Manufacturing, Electricity, Gas and Water Supply 2012).

The surface mines account for two-thirds of the whole production and one-thirds is underground mines. According to the Ministry of Energy, 420 underground mines and 360 open coal pits are located in Russia. More than 1800 crushing, screening, sintering and dressing plans are engaged in production of mineral commodities. The majority of Russian mining companies use locally manufactured mining equipment with domestic components inside (Coal mining in Russia today 2012).

The coal reserves are mainly concentrated in the Russian Far East and Siberia, with the rest in Europe and the Urals. The biggest coal mining clusters of Russia are localized in four areas (basins): Yakutia, Kuznetsky, Kansk-Anchinsky and Pechorsky. The Kuznetsky is the major basin and accounts for 59% of aggregated coal production in Russia. Figure 5 presents locations of the major Russian basins.

Figure 5. Major coal basins in Russia (Russia Coal Industry: a Major Emerging Market for Joy Global 2015)

2.2.3 Transport

Because of the huge territory of Russia and the undeveloped traffic network, especially in the Russian Far East and Siberia, railway system is the major means of transportation of the mineral commodities. Annually, it freights around 85% of all the mineral commodities, 10% by water transport and 5% by highway transport. In 2001, Russian authorities proposed a new reformation program for the domestic railway system. The main idea of the program is to establish a transparent market environment and separate the regulatory functions from the ownership functions (Pittman 2011). In 2003, the Russian Ministry of Railways delegated revenues and commercial activities to state-owned company OAO RZD. In 2010, the Russian government created competitive environment for long distance and freight operations. Today, OAO RZD is the second largest railway system in the world with 85200 kilometers of track, with 20227 passenger locomotives and 1026600 goods wagons (Key Facts and Figures: Russian Railways 2015).

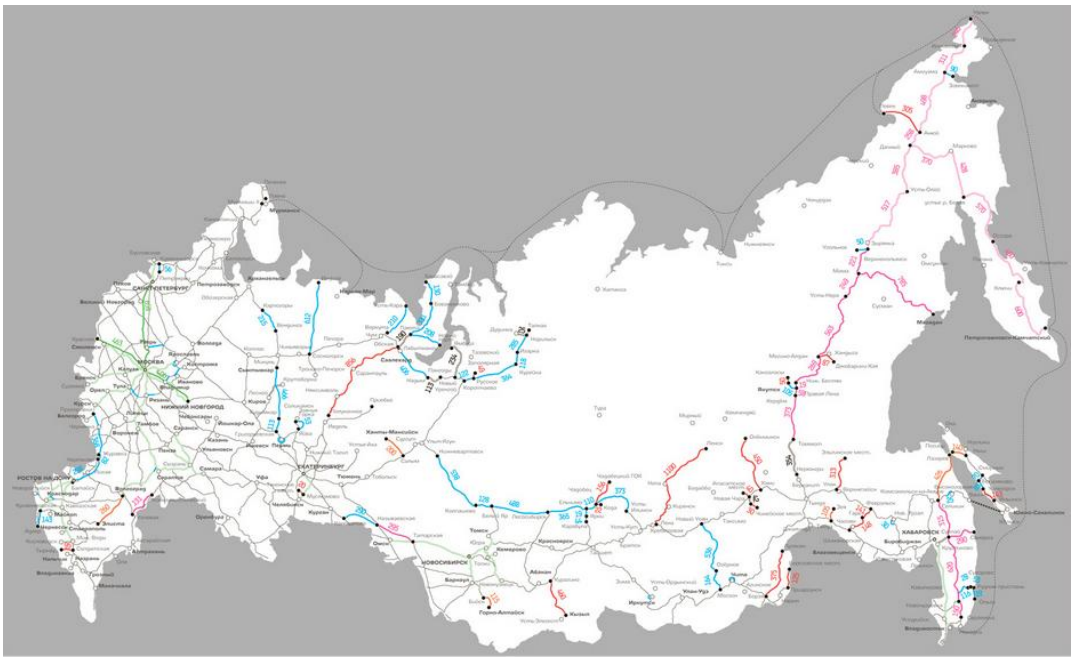


Figure 6. Russian Railway system (Developing Strategy of the Railway System 2009)

The Russian railway system is mostly concentrated and developed in western and south parts of Russia. The major coal basins in Siberia and the Russian Far East have access to the railway tracks and infrastructure.

2.2.4 Prices

The prices for the natural resources in Russia forms under the influence of different factors, such as expenses, balance of the demand and supply, government's regulating measures, global market prices, investment policy, etc. According to the market development the importance of the market rates increase is determined by the supply and demand rules but not by government. Figure 7 depicts dynamic of prices for the forge and caking coal in Russia.

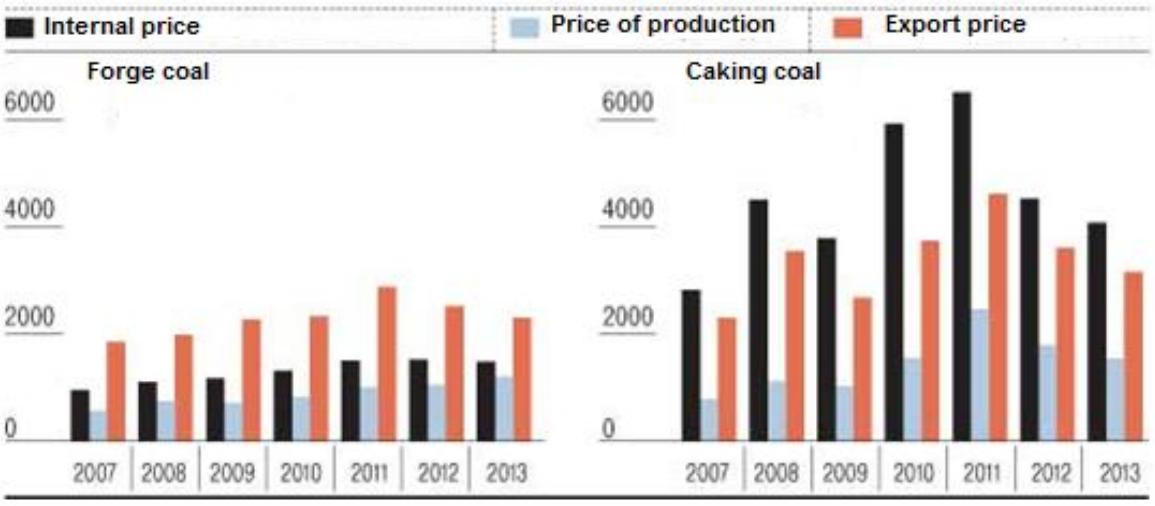


Figure 7. Prices of Russian forge and caking coal (RUB/T) (Coal labeled fall behind 2014)

As we can see in the figure the end at the end of the 2014 the coal prices reached its five year minimum. This condition is governed by the over demand tendency and relatively high export prices.

Concerning other strands of mining sector the annual average price for the gold increased from $696.7 per oz in 2007 till $1670 per oz in 2012. However in the 2013 the growing tendency changed and commodities started to fall in price, inevitably the gold's price decrease to $1411 per oz in 2013. Progressively as global economy emerge from the crisis; the commodities prices keep the growing trend till the middle of 2011. In the 2010 the aluminum price growths in 1.7 times compared with 2009. The price on the pure cooper increased in the 2.6 times from $3453 per ton till $9147 per ton. The nickel price rises in a 2.5 times from $9500 per ton to $24111 per ton. The 2011 was a crucial moment for the fair tendency, stores of the metal resources at the warehouses spiked, the curtailment on commodities demand was observed in the real economical sector, following volume lowering of the overall production at the second part of the 2011 and at

the end of the year the world price for metals slumped 30-40% (Russia Economy 2008-2013 2014).

In the 2012-2013 conjunctures at the global markets for the nonferrous metals proceed to deteriorate, what leads to the following price cutting. Thus, the annual price for the aluminum firstly reduced from $2401 per ton in 2011 till $2023 per ton in 2012 and $1847 per ton in 2013; for the pure cooper prices reduced from $8828 per ton in 2011 to $7291 per ton in 2013 and nickel from $22910 per ton in 2011 to $14101 per ton (Russia Economy 2008-2013 2014).

2.2.5 Exports

According to the Russian Ministry of Energy, in 1994 Russia exported 24.2 MT of coal for $752 million. Since 1999, the export volumes of Russian coal have tendency of stable and steady growth. The figure 8 presents dynamic of Russian coal exports in 2009 – 2013.

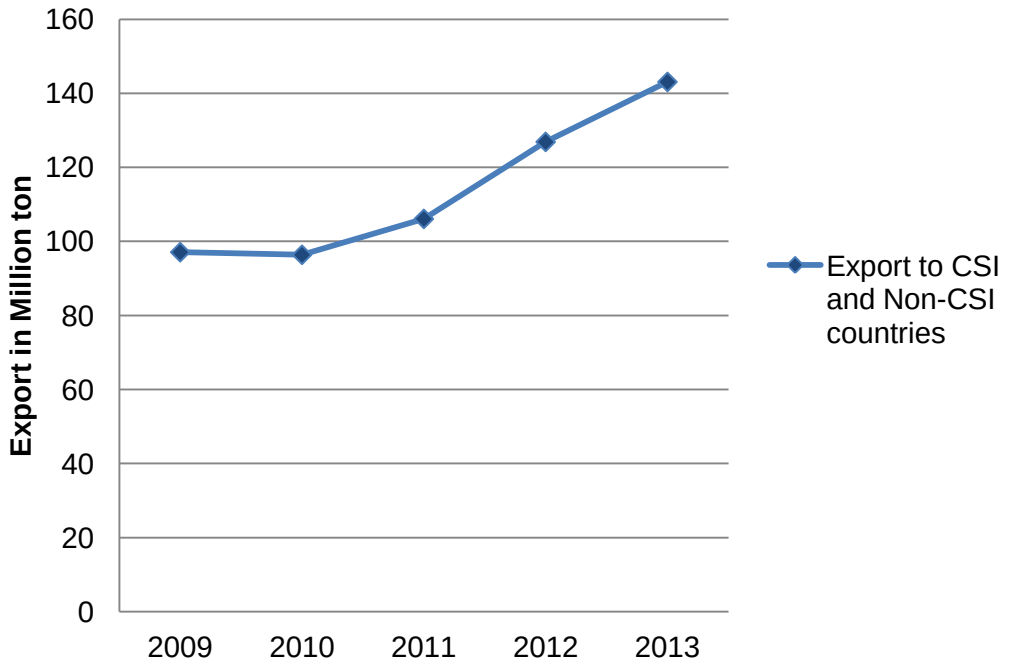
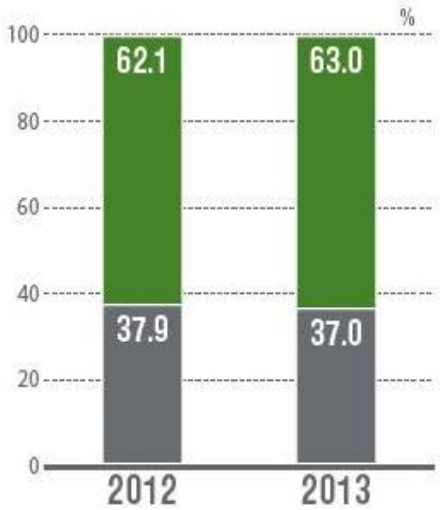


Figure 8. Export volumes of Russian coal (Coal Mining Industry 2015)

In 2011, Russia exported more than 100 MT of coal and reached third place as the world's biggest supplier. In 2012, Russia exported 126.9 MT of coal. Siberian Federal District is a dominant supplier of export coal in Russia, the share of Kuznetsky basin in it is 75.7%. The figure 9 presents share of major suppliers of export coal in Russia by districts in 2013.

Figure 9. The Russian coal suppliers by districts (Coal Mining Industry 2015)

According to the Russian Ministry of Energy 143.1 MT of coal was exported, including 58 MT to the countries of the Pacific Rim in 2013. 90 MT of coal was exported through the Russian seaports, including 48 MT through the Russian Far East seaports. 52.2 MT of coal was exported through the Russian border points. The figure 10 presents exports structure of coal in 2012-2013.



Notes: Green segment – exports trough seaports; Grey segment - exports trough border points.

Figure 10. Exports structure of Russian coal (Coal Mining Industry 2015)

The Russian export figures for the major mining products demonstrate volatility for the last 6 years. The ferrous metals and products made of them take 4.3% out of total value of Russian exports in 2012. The leading items among them were carbon steel products – 34.8%, steel and flat-rolled iron – 25.9%, bituminous coal – 2.5%, mineral and nitrogen fertilizers – 1.45%, aluminum – 1.2%, nickel – 0.71%, concentrates and ferrous ores - 0.47%. Figure 11 presents main export goods of Russian mining sector.

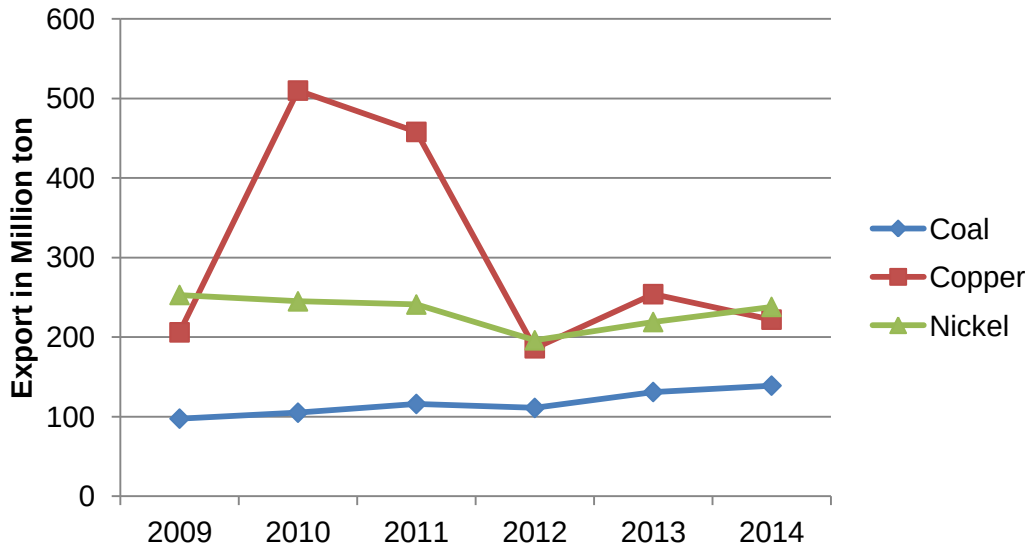


Figure 11. Main export goods of Russian mining sector (Russian Federation External Trade 2015)

2.2.6 Legislation

During the post Soviet period the FDI in Russian mining sector was relatively low. The failures of Norsk Hydro in Kirovsk, Celtic Resources in Yakutsk prevented other foreign mining entities, which were ready to operate in Russia, but had serious problems with state authorities. However, there were several successful cooperation projects between foreign investors and Russian mining companies, such as, Bema Gold with Juliette mine, Kinross Gold with Kubaka and High River Gold and Buryatzoloto (Raiklin 2005). In 2006 Rio Tinto and Norilsk Nickel concluded a co-operation agreement. The new development project and joint venture will be established in the Siberia and Eastern Russian. The first president of Russia Boris Yeltsin issued a degree; enabling foreign companies to sell its produced gold species directly abroad. Furthermore, the new legislative schedule on raw materials incentivized international cooperation between Russia and foreign mining companies (Verzhanski 2014).

However, despite of new legislation exemptions, foreign investors still have bureaucratic acrimonies in Russia's mining sector. In the near future Russian mining sector will be dominated by national mining companies. Russia is the major palladium and nickel producer and possesses massive reserves of copper, platinum and gold. Much territory of Russia remains undeveloped and thus there is a big probability for the exploration of new

natural recourses. Unfortunately, this potentially new recourses are accessible for domestic mining companies. Additionally, export duty on nickel is 3.8%, copper is 10% and platinum metal is 6.5%. In 2010 Russia imposed the levy, which constrains nickel exports and the state authorities revised the gross royalty tax, at the level of 6% for all mining companies. Foreign companies which extract Russian strategic resources, such as gold and copper, must obtain permission from the state committee. Foreign companies cannot mine wide specter of natural recourses: Cobalt, diamonds, uranium, lithium, nickel, tantalum, the platinum group metals and niobium. Legal obstacles prevented foreign companies from cooperation with Russian companies, and insufficient reserves with the bureaucratic obstacles become relatively unattractive (Russia Economy 2008-2013 2014).

In 2012, the Russian authorities revised the terms and conditions that identify strategic importance of natural resources. New criteria have implications for FDI and foreign partners, which face constrains with respect to business operation in Russian strategic reserves. For example, gold mining would be considered as strategic reserve, if it had 50 metric tons of gold. According to the new criteria, gold mining becomes strategic if it has more than 250 metric tons of gold. The Russian Government expects that a new policy will attract new foreign capitals to the Russian mining industry. The Russian joint ventures, such as OAO Polyus Zoloto and OAO Polymetal, will get new benefits in the near future. The share of FDI in Russian mining companies will reach 25% instead of 10% in the coming years. In the same year, the President of Russia enacted the bill, which states that resources of Federal importance, mining and development licenses can be obtained only through the process of auction. The new action system has two advantages compared with system of tenders. The actions are more transparent, with fewer disputes and they provide the Russian government with higher revenues received for the procedures of license (Safirova 2015).

2.2.7 Key financial statistics

Despite of a set of obstacles related to government restrictions Russian Mining sector has a high potential for further development. According to the Metals and Mining in Russia, the industry will reach level of $161 billion in 2018. The Russian government invests more than $130 billion in the period from 2013 to 2030, which provides industry with stable growth of 2% to 3% annually (Metals and Mining in Russia 2015).

Market value

The Russian mining sector had total revenues of $122.4 billion in 2013. During the period from 2009 to 2013 the Russian mining sector had CAGR 8.2%. Table 7 presents annual the market value for period 2009-2013 (Metals and Mining in Russia 2015).

Table 7. Market value of Russian mining sector

Year	$ billion	% Growth
2009	89.2	
2010	125.9	41.1
2011	148.1	17.6
2012	136.9	7.5
2013	122.4	10.6

The volume of industry production increased with CAGR of 3.4% in 5 year period and reached 445.4 MT in 2013. In 2018, volumes of production will rise to 522.3 MT. The performance of mining sector is forecast to decelerate with CAGR of 4.3% in 5 year period and reached value of $151.3 billion in 2018.

Market volume

The Russian mining industry decreased by 7.9% in 2013 and reached a volume of 445.4 MT. During period from 2009 to 2013 the Russian mining industry had CAGR 4.4%. Table 8 presents annual market volume for period 2010-2014 (Metals and Mining in Russia 2015).

Table 8. Market volume of Russian mining sectors

Year	Million metric tons	% Growth
2009	389.7	
2010	446.8	14.7
2011	449.0	0,5
2012	483.7	7.7
2013	445.5	-7.9

Forecast of market value

In 2019 the Russian mining sector will reach a value of $151.3 billion, an increase of 23.6% since 2013. During the period from 2013 to 2018, CAGR will be 4.3% for the Russian mining sector. Table 9 presents the annual market value for period 2013-2018 (Metals and Mining in Russia 2015).

Table 9. Market value forecast of Russian mining sector

Year	$ billion	% Growth
2013	122.4	-10.6
2014	122.5	0.1
2015	130.6	6.6
2016	139.7	7.0
2017	143.1	2.4
2018	151.3	5.7

Forecast of market volume

In 2018 Russian mining sector will reach a volume of 522.3 MT, an increase of 17.2% since 2013. During period from 2013 to 2018, CAGR will be 3.2% for the Russian mining sector. Table 10 presents the annual market volume for period 2013-2018 (Metals and Mining in Russia 2015).

Table 10. Market volume forecast of Russian mining sectors

Year	Million metric tons	% Growth
2013	445.4	-7.9
2014	479.0	7.5
2015	495.8	3.5
2016	499.6	0.8
2017	511.7	2.4
2018	522.3	2.1

2.3 Taxation of oil and mining sectors

Oil and gas taxation system in Russia has a range of serious defects: it excessively pegged to company's revenue, rather than taxes or company's profit, it is exposed to frequent rectification processes and lastly it is overmuch complicated (Sagers 2002). The average oil company pays to the fiscal authorities, local and federal, 30 different payments and taxes, although some regions in Russia impose additional tax rates and payments. In the time period of 1990-2000s oil entities pay more that 50% of tax burden, based on the company's gross revenue. However, at the end of 1990s, the tax burden dramatically dropped in consequence of the ruble's devaluation and oil price escalation. In 2002 the tax burden for the average oil company was 35% of gross revenue (Cukrowski 2004).

Today, export taxes, exercise taxes, and mineral extraction taxes on natural recourses make a sufficient part of revenue for the Russian Government. In Russia, the corporate profit tax rate is 20%, the VAT rate is 18%, the social security tax rate is 34% and the labor income tax rate is 13%. In 2013, government revenues were formed through several major sources: trade taxes – 20.8%, social security contributions – 19.5%, VAT – 14.7%, payments and taxes on natural resources – 12%, personal income tax – 10.4 and corporate income taxes – 8.6%. The tax bases and tax rates determine the volume of tax revenues. The export taxes on natural resources, such as natural gas, oil products and crude oil form revenues from trade taxes. For example, total revenues from international trade consist mainly of export taxes on crude oil – 46.7%, petroleum products – 24.1% and natural gas 9.6% estimated. The coal and electricity are tax deductible. The Russian Government monthly recalculates export taxes on oil products and crude oil in accordance with fluctuations in the index of Urals blend. The oil products have different multiplier coefficients. For example, petrol has a coefficient, which equals to 0.9 for the time period 2014-2016, for diesel fuel it was equal to 0.65 in 2014, 0.63 in 2015, and 0.61 in 2016. The major aim of the Russian government is to provide support for national refineries, reducing the rate of export tax on oil products relative to the rate of export tax on crude oil. In 2013, the rate of export tax on crude oil was $420/tone, which amounts to half of the price of Urals blend. The rate of export tax on oil products depend on the rate of export tax on crude oil (Orlov 2015).

Royalties and taxes on mineral resource extraction are significant revenue items for the Russian Federal Budget. The tax rate on mineral extraction on anthracite was 47 ruble/ton or $1.175/ton, for brown coal – 11 ruble/ton, for coking coal 57 ruble/ton and for blind coal

– 24 ruble/ton. In 2013, 962 ruble/ton was an average price of coal production. The tax rate on mineral extraction is relatively low, for example, the tax rate on blind coal was only 5% of the prime cost. In 2013, the base rate of mineral extraction tax on crude oil was 470 ruble/ton or $11.75/ton. In 2014, the base rate increased till 493 ruble/ton. The Russian government projected a new base rate for 2015 – 530 ruble/ton and 2016 - 559 ruble/ton. The future tax rates are indexed based on the expected inflation rate and the current tax rate. The negative impact of the royalty will be diminished through the multiplier coefficients, such as, depletion or stock coefficients. Furthermore, the Russian Government proposed tax exemptions and reduced tax rates for oil and mining companies in regions such as Nenets Autonomous Okrug, Irkutsk Oblast, Sakha Republic and Krasnoyarsk Krai. The floating tax rates in the combination with tax exemptions and reduced tax rates allow oil and mining companies to redirect extra revenues for the further development and investment projects (Safirova 2015).

Summary

The previous overview shows that mineral resources sector was represented as a protuberant part for the economical and social life of Russia. New governance come to power in 2000 made weightily changes in the mining sector, on the back with the natural resources extraction multiplication trend. In that way the production of oil and gas was associated with the continuous growth. Furthermore the production of mineral resources continuously goes from strength to strength along last decades. The Russian government heavily relies on the revenues from natural resources production, earning from it equals to one-fifth of national GDP, 40% of aggregate oil and gas export revenue and more than 20% of fiscal revenue of the federal budget. Figure 12 presents proportion of oil and gas revenues in the Russian Federal budget.

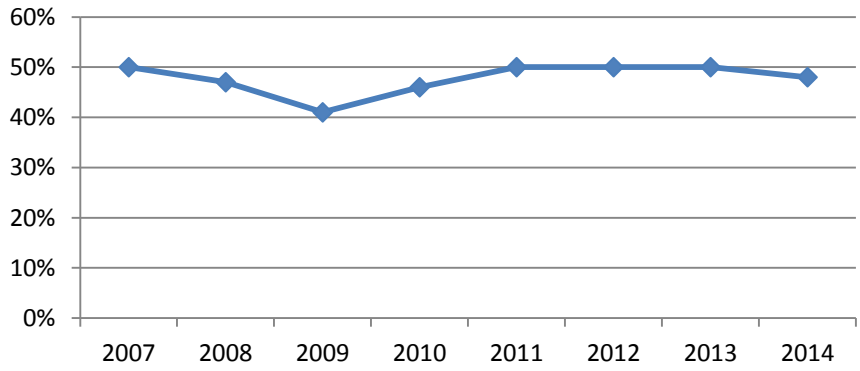


Figure 12. Oil and gas revenues in the Russian Federal budget (Russia Economy 2014)

The governmental restructuration of industry and its privatization lead to the vertically integrated companies and slicing the industry among the national oligarchy. The main players of oil and gas business in Russia are represented by the 13 companies, while 2 of them are owned by government. The mining sector is divided in clusters, which form the quasi monopoly, the Norilski Nickel is one of the brightest examples. Transportation system in the country also belongs to the government, the pipeline system for oil and gas is controlled by the government similarly with railways, which are main transportation systems for the mineral resources.

It is necessary to notice, that the gas and oil production rate is notably higher than discovery rate of new oil and gas fields by an important margin. In order to improve and increase Russian oil and gas production from the present rates, a high volume of financial recourses will be invested to drill out new oil fields and to enhance the capacity of current oilfields with low-level of reserves and exhausted environment. Today the aggregate level of annual investments in the oil and gas sectors amount to $10 billion.

The economical and geopolitical situation of the last years force the changes in the legislation and taxation areas for the mining industry. Therefore a reduction in the tax rates for the extraction and export of the mineral and hydrocarbon products allows companies to initiate the investment. According to the Russian Ministry of Energy, a new policy has been introduced to reach the desirable conditions of gas and oil sector development. “Basic Assumptions of Energy Strategy of the RF for the period until 2030” designed to reverse current fiscal system for the gas and oil sectors and rein in rising tax burden rates. The Russian government reorganizes obsolete oil and gas models, which are primarily focused on short-term objectives and measures to enhance company’s fiscal revenue (Energy Strategy of Russia for the period until 2030 2009).

Now, the government shifts from fiscal activities to policy making, establishing adequate long-run rules for oil sector. However, taking into consideration challenging situation with Yukos few years ago and massive public outcry after that, new government policy will have long-lasting tenacity tests.

3. LITERATURE REVIEW

3.1. Definitions and types of corporate investment

CAPEX (capital expenditures) indicates critical company's capital budgeting decisions such as equipment replacement, plant expansion and etc. The significance of capital expenditures to company prosperity is well known and established in economic, accounting and finance literature (Fama and Miller 1972; McConnell and Muscarella 1985; Kerstein and Kim 1995). It causes positive effects on two major levels. Corporate capital expenditures, at the macroeconomic level, are an important subcomponent of national GPD, business cycles, economic growth and aggregate demand (Dornbusch and Fisher 1987). At the microeconomic level, CAPEX determines strategic projects, development plans (Bromiley 1986) and company's production release (Nicholson 1992). The firm performance is also directly linked to the CAPEX (McConnell and Muscarella 1985).

Taking into consideration macroeconomic and microeconomic importance of CAPEX, a large massive of investors, researchers and institutes have tried to evaluate triggers that predict the volume of corporate CAPEX. The scientific tractates dedicated to CAPEX conventionally can be divided into two sub-groups: classical and modern one.

The early attempts in this field include the scientific tractate "The Investment Decision, An Empirical Study" by Meyer and Kuh, published in 1957, authors assessed theories of investment behavior: marginalist theory – profit motive, the principle of acceleration or theory of technical capacity and institutional theory, which outlines internal finance as a preferable resource. A correlation analysis of cross-section data was a major method of research. 500 U.S. industrial listing companies were chosen as a sample, from 1946 to 1950. Companies from the same industry were spited into three main groups according to the level of capital intensity. The correlations between dependent variable – company's investments (investment into capital goods) and range of independent variables – net profit, capacity utilization, sales, depreciation, the dividend-profit ration and liquidity stock were testified. All variables were normalized by the company's fixed assets. First, authors find out positive relationships between: business improvements and production capacity, which leads to purchase of assets. Second, liquid funds play a major role, when a company is in the declining or stable consistency. These findings allow to interpret business behavior in the long-run and short-run and the cover the behavioral differences between small and large companies.

The scientific paper – 'Capital Theory and Investment Behavior' was published by Dale W. Jorgenson in 1963. In this paper the author practically assessed the investment behavior theory which is based on the Fisher's neoclassical theory of optimal capital accumulation. The author clearly identifies and separates two concerns: company's demand for investment and capital. Investment behavior in the short-run depends on the time formation of lagged reaction to alternation in the capital demand. The author for simplicity made an assumption that the time formation of lagged reaction is fixed. Capital stock and replacement investment have fixed proportion too. A maximization of net worth depends on the capital stock. Stochastic equations with regression analysis were major methods of research. OBE-SEC Survey was the main source of quarter's data collection, providing information on U.S. manufacturing companies, from 1948 to 1960. In the regression model company's capital stocks serve as dependent variable, whereas two groups of factors act as independent variables: market conditions – price of capital goods, rate of interest, price of output and tax structure – proportion of replacement, income tax rate and proportion of interest. The author determined consistent patterns between changes in company's capital stocks, rate of interest and price of output. A decrease of interest rate fosters companies to increase a rate of investment in capital stocks, conversely increase of output price leads to the same company's behavior - investment in capital stocks becomes higher.

The significance of corporate CAPEX and ambiguous findings of the previous scientific papers encourage researchers for the new investigations of determinants and triggers of CAPEX. The article – 'The Association between Performance Plan Adoption and Corporate Capital Investment' was published by David F. Larcker in 1983. The research paper assesses the relationships between modified compensation contracts for executive, which includes the adoption of a performance plan, alteration in corporate capital investment and market performance of company's securities. The data sample consists of companies from related industries, but it was divided into two sub-groups: 204 companies which have a performance plan from 1971 and 1980, 204 companies without a performance plan. To assess the main trend of CAPEX behavior between control and experimental companies, author used Wilcoxon test and paired t-test. Growth rates and annual levels were taken into account, where growth rates were calculated for 10 years time period, starting from 6 years before the implementation of performance plan adaptation. The empirical results revealed that companies implementing performance plans experience spurt of growth in CAPEX and a positive market reaction which leads to

the value increase of company's securities. Additionally, modification in compensation contracts for executive has a strong influence on managerial decisions.

Steven M.Fazzari and Michael J. Athey published article 'Asymmetric Information, Financing Constraints, and Investment' in 1987, where they revaluated the neoclassical theory of appropriate capital accumulated, which was firstly introduced by Jorgenson (1963). The models of neoclassical theory discard the significance of financial variables; however CAPEX may be determined by the financing which company can generate. The authors provide a theoretical framework that embraces asymmetric information and its effect on the financing of company's fixed investments. 637 manufacturing firms with annual data were included in the sample, from 1975 to 1985 years. The data from the sample was adjusted to real terms, using relevant price deflators. The results of the regression model emphasized a range of consistent patterns: companies invest less amount of money if they have high interest expenses, direct correlation between company's growths of internal finance and investments in property, plant and equipment.

The article 'Financing Constraints and Corporate Investment' was published by Steven M.Fazzari, Glenn R. Hubbard and Bruce C. Petersen in 1988, authors expanded and tested traditional model – accelerator and neoclassical approaches of investments, using q model, which supported and provided additional explanations of the research findings. All the data in the sample presented by manufacturing firms, companies were included based on the strict parameters: availability of annual data starting from 1969 to 1984, companies with large merger activities were excluded (value of merger - more than 10% of company's capital stocks). The starting point of the research in 1969 was taken due to availability of the inventory data for the construction of q variable. Authors stated that: company's capital investments become more sensitive to the cash flow changes, when company's internal finance is exhausted. Depending on company's characteristics CAPEX has different sensitivity to the liquidity indicators from balance sheet. Financial effect causes the highest impact on CAPEX, when information problems of capital markets related to the high-retention companies. Companies with financial constraints, CAPEX is more sensitive to marginal tax rates and the average tax burden. Company's financial constrains have clear relationship with conditions of aggregated economy and movements of business cycles, due to changes of company's liquidity and cash flows.

Two independent researchers investigated relationships between CAPEX and incorporation of short-term bonus plans. The article 'Short-term Compensation Contracts

and Executive Expenditure Decisions: The Case of Commercial banks was published by David F. Larcker in 1987, examines changes between executive's CAPEX decisions and incorporation of short-term compensations agreements for the company's managers. The author assessed changes in CAPEX which based on the discretionary items – CAPEX is more preferable by the company's managers than by the company's share-holders. 50 large commercial banks with a precise description of short-term compensations plans were selected as a sample and divided into two sub-groups: experimental and control banks. The compensation plans were obtained through management consulting companies. All the banks in the sample satisfied a range of specific requirements: time of plan adaptation – from 1973 to 1978; matched bank from the sample (size, the Fortune 50). The empirical analysis was used as the basic method of research, matched-pares were compared by using Wilcoxon MPSR Test. The outcome indicates that the incorporation of short-term bonus plans is connected with low decreases in the ratio of CAPEX to company's operation revenues and the ratio of CAPEX to manager's compensations. Year hence article 'The association between the adoption of short-term bonus plans and corporate expenditures' was published by James F. Waegelein, in 1988, the author investigated the same relationships between CAPEX and short-term compensation schemes for company's executives, but based on the industrial companies as a sample. The results revealed the range of trends: CAPEX dramatically increases when a firm incorporates bonus plans for the executives and stock market has positive reactions when company reports new short-term bonus schemes for the top employees.

The article 'The Influence of Long-Term Performance Plans on Corporate Performance and Investment' was published by James F. Waegelein in 2014, the author expands his previous tractate and examines relationships between the incorporation of long-term bonus plans and company's CAPEX. The long-term bonus plan has a set of specific characteristics: the plan is based on the multiple year timeframe – 3 to 5 years; the plan includes earnings per share as a major ration and set of additional indexes – ROA, ROE (Gaver 1992); each executive gets fixed the amount of company's shares; each executive's share has market value at the specified time; the number of shares depends on company's performance. The results of research confirmed positive relationships between company's long-term performance plans and a range of independent factors: M&A, CAPEX and divestiture, supported by long lasting economic goals of the firm and overall economy.

The article ‘Internal Cash Flow, Insider Ownership and Capital Expenditures’ was published by Emmett H. Griner and Lawrence A. Gordon in 1995, authors analyzed relationships between internal cash flow and CAPEX of the company, based on two agency arguments: managerial and pecking order hypotheses. Myers and Majluf (1984) introduced the pecking order hypothesis, which states that level of CAPEX determined by the managers who maximize shareholders wealth, despite of executive’s ownership stake in a company. Based on the managerial hypotheses, executives with limited ownership stake in a company utilize internal cash flow to support specified level of CAPEX bigger than that which provides maximized benefits of outstanding shareholders. According to pecking order hypothesis there is no relationship between insider ownership and CAPEX, but managerial hypotheses associates with inverse relationship between CAPEX and insider ownership. Authors obtained the required information through a mailed request for company’s proxy statements for period 1985 to 1988. The companies from the sample were chosen based on the Fortune 500, which presents list of US leading companies, with industrial nature and are wide utilized in previous research tractates. Two major steps were used to assess the managerial and pecking order hypotheses. First, bivariate associations were tested between insider ownership, CAPEX and internal cash. Second, benchmark equation was proposed as a control parameter for other items that may cause effect on the CAPEX level, such as tax, interest expenses and operation income. The major result of the research is deficiency of relationship between insider ownership and CAPEX, after control procedures for company’s determinants of CAPEX. The pecking order hypothesis was supported by final outcome, while managerial hypothesis had lower support from the results. Managers rely on company’s cash flow to increase CAPEX due to information asymmetries between a potential shareholders and managers, rather than conflicts of interest between current shareholders and managers.

The article ‘Return on Investment and Corporate Capital Expenditures: Empirical Evidence’ was published by Lawrence A. Gordon and Raghavan J. Iyengar in 1995, authors examine relationship between ROI and CAPEX decisions in a company. The relationship between variables was tested under specific conditions which reflect conflict of interests between managers and company’s owners, and conditions when the participants have the same interest and harmonized environment. To test the hypothesis authors considered four control variables which have impact on CAPEX: acceleration principle, capital intensity, growth in sales and flow of funds. To test the underlying dimensions of the four control variables analysis of common factors was implemented. Then the analysis of residual regression was conducted to evaluate regression between

CAPEX and scores of the composite factor. The final regression with obtained residuals was regressed on control variables. The main data for the sample was obtained through Compustat database in period from 1989 to 1992. US industrial companies listed on AMEX and NYSE were presented in the sample. All companies in the sample satisfied the major requirement: current year ROI exceeds company's weighted average ROI, calculated at the beginning of the time period. The main results support the hypothesis that incremental improvement or maximization of ROI is strongly associated with CAPEX, even when it has a clear negative effect on the company's value. Further, industrial competitive factors and insider ownership reduce the ineffective sides of ROI driving CAPEX.

The article 'Determinants of Private Corporate Investment: Evidence from Indian Manufacturing Firms' was published by Surajit Bhattacharyya in 2009, author empirically tests for the existence of CAPEX determinants, such as company's financial strength, internal liquidity and profitability. The author utilized the annual data from Balance Sheets and Profit and Loss Statements of Indian listed companies in the Bombay Stock Exchange. According to the industrial code, all companies were classified into four groups: General Engineering, Cables, Electrical Equipment and Electronics. The timeframe for the research is six year period, from 1992 to 1996. The author's major method is a regression model, in conjunction with OLS method and exogeneity test. Two empirical models were evaluated simultaneously, both with common features. To assess the existence of CAPEX determinants, author evaluated two hypotheses. The first hypothesis states that an increase in company's profitability incites CAPEX. The second hypothesis states that company's financial strength induces investment decisions. The main results support the existence of CAPEX determinants. Internal funds determine level of CAPEX more than company's profitability. The amount of retained earnings has direct relationship with firm's CAPEX. The company's financial strange fosters company to increase CAPEX. Short-run profitability does not cause any effect on company's CAPEX.

The article 'Firm Size and Investment-Cash Flow Sensitivity: The Developing Country Evidence' was published by Marina Mustapha and Ng Huey Chyi in 2010, authors examine relationship between CAPEX and range of company's financial factors. The relationship between dependent and independent variables was assessed under specific circumstances, which reflect company's size and financial strength. To test the hypothesis authors extracted required financial data from the Malaysian Bourse. The sample for the research consists of the top twenty and bottom twenty companies of the FTSE 100-index.

Financial companies and companies with government support were excluded from the sample. The sample presents entities from various industrial sectors. The annual financial data was extracted for the period 2005-2007. The regression model was applied as the major method. The final results confirm findings from the previous research papers. CAPEX in large size companies are highly sensitive to changes of cash flow. The large size companies heavily rely on their internal funds, which are the major resource for growth and investments. Also large size companies have an ability to reschedule their investment projects due to financial and macroeconomic constraints. Large firm's CAPEX shows strong direct relationship with cash flow, but small size companies do not demonstrate the same behavioral model. Company's cash stock has positive relationship with CAPEX, but a coefficient was insignificant. Tobin's Q test did not cause any effect on company's CAPEX in both groups, which is similar result with Kapadakkam, Kumar and Riddick (1998).

Table 11 presents structured set of scientific papers in chronological order, where range of company's internal factors has an impact on CAPEX.

Table11. Examples of scientific papers with set of internal factors

Authors	Sample	Results
Fazzari, Hubbard and Petersen (1988)	US industrial companies, observation period: 1970-1984.	Cash Flow (+), Cash Assets (+), Tobin's Q (+).
Sanjai and Welch (1995)	R&D Investments: US, Canada, UK, EU and Japan. Observation period: 1985-1990.	Cash Flow (+), Financial Leverage: US (-), Japan (+). Tax Payments: Japan (+).
Serrasqueiro, Mendes and Nunes (2000)	Portugal industrial companies, observation period: 1998-2004.	Financial Leverage (-), Cash Flow (+),Revenue (X).
Lee and Hwang (2003)	Korea industrial companies, observation period: 1980-1999.	Market concentration (X), Company size (+), Dividends (-), Financial Leverage (-).
Teplova (2007)	Russian industrial	Cash Flow (+), Tobin's Q

	companies, observation period: 2000-2005.	(+), ROI (+).
Mustapha and Chyi (2010)	20 first and 20 last companies from the list of FTSE 100, observation period: 2005-2007.	Cash Assets (-),Tobin's Q (+), Revenue (+).
Cherkasova and Smirnova (2012)	Russian industrial companies, observation period: 2007.	Investments in prior period (+), Revenue (+),Cash Flow (+),Capital Intensity: Adult Companies (-), Young Companies (+).

Notes: “+” indicates direct significant impact of factor on the CAPEX; “-” indicates inverse significant impact of factor on the CAPEX; “X” indicates statistically insignificant impact of factor on the CAPEX.

3.2. Theories of the triggers of CAPEX and internal cash flow

The first consistent commensuration of the interpretive power of distinguished theories of the triggers and indicators of CAPEX was conducted by Jorgenson in 1963.Using time series analysis of 15 US manufacturing companies over the 20 years author established and ranked the explanatory framework: (4) liquidity,(3) expectations, (2) sales accelerator and (1) neoclassical. Elliot (1973) expanded the Jorgenson’s tractate by conducting time series and cross-sectional techniques using data of 183 non-manufacturing and manufacturing companies. Elliot’s time series and cross-sectional results ranked the liquidity model on the first place. Nair (1979) argued that the arranging of the explanatory models be contingent upon the accounting methods practiced. The explanatory power of neoclassical and liquidity models were compared by Grabowski and Mueller (1972), the letter was statistically and conceptually superior. Fazzari and Athey (1987) documentary confirmed that liquidity models provide strong explanatory power to sets of CAPEX models.

Generally previous researches agreed that company’s internal cash flow is significant identifier of CAPEX level; however a mechanism of this pattern is still unclear. Successors of the agency theory promoted two distinct interpretations for the relationship between CAPEX and company’s internal cash flow. Managerial and pecking order hypotheses are

two explanations. The conflict of interests between company's shareholders and managers does not consider according to the pecking order hypothesis. According to Myers and Majluf (1984), managers have to rely upon company's internal cash flow due to information asymmetries between potential shareholders and themselves. Managers trying to avoid the low-valuation of company's shares associated with capital markets imperfection, thus they rely on company's internal cash flow, whereby holding the possibilities to undertake CAPEX that enhance the prosperity of company's shareholders.

In opposite, the managerial theory pays a lot of attention to the conflicts of interests between company's shareholders and managers that emerge from the splitting of control and ownership. The first researchers who acknowledged disputes between owners and managers were Berle and Means (1932). Marris (1964) placed special emphasis on CAPEX and company's internal cash flow as major aspect for this dispute by proving that managers generally invest higher part of company's earning than the optimal for shareholders. Grabowski and Mueller (1972) claimed that usage of company's internal cash flow for CAPEX financing purpose is manager's explicit process, focused on manager's interests and prejudicial to shareholders.

Capital Expenditures, Internal Cash Flow and Insider Ownership

The conflict between owners and managers was framed into agency theory by Jensen and Meckling (1976). They argued that, managers who have fewer than 100% of the company have opportunities and incentives to realize actions that cause a negative effect on shareholders. The managers exercise incentives because they are not responsible for the pecuniary costs, but they receive non-pecuniary bonuses due to their actions. Larcker (1983) demonstrated positive relationship between shareholder returns, CAPEX and accommodation of long-term bonus plans. Similar outcomes were obtained by Waegelein (1988) for companies that introduced short-term performance schemes. Newman (1989) stated that the level of CAPEX was combined with selection of pre-tax or after-tax earnings methods in compensation schemes for managers. Gaver (1992) proposed that companies introduce long term compensation schemes to consolidate shareholder interests and management incentives in the sets of investment opportunities. Generally, authors endorse views that CAPEX are subjected to the agency theory and incentive-based bonus schemes, which are designed to align the shareholders and managers interests.

There is a limited amount of information dedicated to relationship between CAPEX and insider ownership. However, the stately proportions of research papers that assesses the other impacts of insider ownership. Lehn and Poulsen (1989) found that insider ownership fosters managers to promote decisions that enhance shareholder's interests. Morck, Shieifer and Vishny (1988) examined relations between company's financial performance and insider ownership. Jensen, Solberg and Zorn (1992) found interconnections between debt levels, dividend policies and insider ownership. Agrawal and Mandelker (1987), Sicherman and Pettway (1987), Benston (1985), Walkling and Long (1984) found reasons that that insider ownership causes effect the nature and the level of company's M&A activities. However, based on previous research papers the insider ownership has strong and broad impact on company's policies and decision processes, which lends confidence to the abilities that CAPEX levels depend on influences of insider ownership.

4. RESEARCH QUESTIONS AND HYPOTHESES

4.1. Research questions

The empirical part of the master theses provides substantiated responses to research questions. The following research questions will be highlighted:

1. What independent variables cause impact on the company's capital expenditures in the model with internal factors?

2. What independent variables cause impact on the company's capital expenditures in the model with external factors?

3. What are the firm level performance variables that determine the magnitude of new capital expenditures reported by publicly listed Russian oil and mining sector companies?

4. What are the macroeconomic indicators that determine the magnitude of new capital expenditures reported by publicly listed Russian oil and mining sector companies?

The academic explanation for the main research questions will be obtained by utilizing the panel data model which provided in the latter parts of the master thesis.

4.2. Main hypotheses

The set of hypotheses was created in order to provide relevant answers to the research questions. According to the characteristics of Russian oil and mining sector, especially formation of oil and gas domestic prices, oil and mining companies operate in unique business environment due to Russian legislation, domestic barriers and etc. Contradictory legislation, rapidly changing tax policy, unstable political situation and high corruption level high volatility of oil prices – all these aspects foster companies to rely on their own financial abilities and operational performance. In order to assess this aspect the major hypothesis is created:

Null hypothesis: Capital expenditures of Russian oil and mining companies have no reaction to the changes of external business environment.

Currently, there are no relevant academic studies, which provide a sufficient explanation and describe relationships between Russian macroeconomic indicators and company's capital expenditures. However, based on the previous research papers it is reasonable to expect positive relationships between company's capital expenditures and positive changes in macroeconomic indicators (Sanjai and Welch 1995). The null hypothesis will be rejected, in consequence of CAPEX reaction to Russian macroeconomic indicators. In order to test the null hypothesis, two complementary hypotheses were evaluated:

The hypothesis of internal performance factors

According to the previous research papers which were conducted both in developed and emerging countries, financial and performance indicators of a company have an impact on capital expenditures. The overwhelming majority of analyzed research papers demonstrate a direct correlation between company's CAPEX and set of internal factors such as, ROI, revenue and company's FCF (Fazzari, Hubbard and Petersen 1988). Additionally, the same pattern was depicted with Russian company's sample (Teplova 2007). The major sample in the thesis research consists of Russian oil and mining companies which have the same principles of operational activities and thus we expected positive correlation between company's performance and CAPEX. The hypothesis for this model is following:

The internal factors hypothesis: There is a positive correlation between company's performance and CAPEX.

The hypothesis of external performance factors

Despite of limited information, referring to company's CAPEX and macroeconomic indexes, we expect strong relationship between CAPEX and macroeconomic indexes. The majority in our sample is Russian oil and gas companies, which are tangentially related to the set of macroeconomic indicators, such as oil prices, export and currency exchange rate. The hypothesis for this model is the following:

The external factors hypothesis: There is a positive correlation between macroeconomic indicators and CAPEX.

The obtained results in the next sections of the master thesis will provide explanation and confirm set of hypothesis.

5. METHODOLOGY

5.1. Panel data methodology

The main goal of the thesis is to differentiate the firm's level and macroeconomic level factors which have an impact on the company's CAPEX and estimate obtained results focusing on the Russian market realities. The findings, achieved in the research, will elicit the influence of factors on company's CAPEX, and will provide explanation of the differences among factors depending on the Russian peculiarities, economic and legislative environment. The structure of the thesis study (Figure 13) demonstrates the major stages of conducting thesis research which allows to receiving of positive findings of the thesis study.

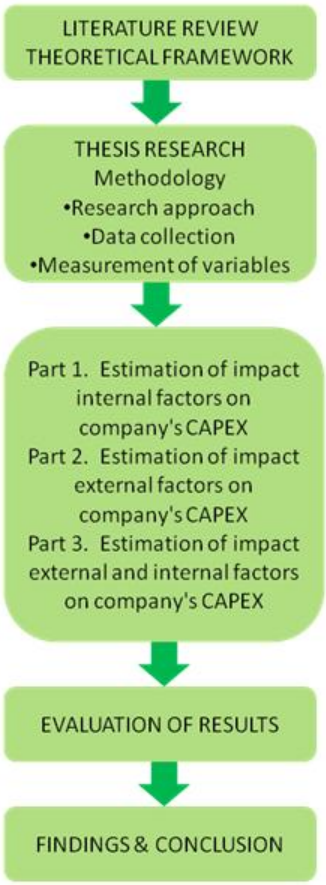


Figure 13. Framework of the thesis study

A quantitative method was elected as a basic approach for the research methodology, according to the major goals and research questions quantitative methodology provides

optimal results with low amount of biases (Fazzari and Athey 1987). The main thesis questions depict the examination of how the internal and external factors of the Russian extracting companies influence on the company's CAPEX. In order to give sufficient and proved answers to the thesis questions, the big amount of relevant data must be gathered and quantitative analysis of the data must be conducted.

A deductive approach used in the research, which starts with the description of the general approach of factors effecting CAPEX and major methods of its estimations, and guides to the particular ideas and hypotheses which are evaluated and examined in the thesis research. Additionally, the comparative method was implemented in the study. The thesis research is held in two separate ways – internal and external ranges of factors – then both ranges of factors are compared to each other. Such method also provides valid results to the hypothesis about the power of influence of factors on company's CAPEX due to the special aspects in the company and Russian environment.

5.2. Data

In order to obtain the sufficient results and provide explanations for the research questions, the Russian company's data has been gathered via Thomson Reuters analytical database and Amadeus data stream. The required data has been gathered in April 2015.

The lists of Russian companies which are taken in the main sample combined in strict order that meets required parameters is appropriate for the empirical study:

- The first criterion is the location and field of activities: All companies in the thesis research have headquarters in Russia and operate in the extracting sector – oil and gas extraction, coal and ironstone mining;

- The second criterion is a company's legal form: All companies which are included in the thesis research are listed companies and all company's stocks are trade via the Russian Trading System (RTS);

- The third criterion is relevant financial information: In the main sample were included companies which have all required financial ratios and metrics, any information gap is inadmissible.

- The fourth criterion is time length of obtained data: All companies have financial ratios and metrics starting at least from 2007 and end at 2013.

Only the annual data has been used in the thesis research, it is related to the special nature of the CAPEX, which characterized by the seasonal nature. Quarter data gives a low rate of the CAPEX in the first quarter and incommensurable rate in the last quarter of the calendar year. Previous research papers (Teplova 2007) indicated that, 70% of Russian companies, which are included into the sample, have clear growth of CAPEX in the last two months of the year (November – December) and only 1-2% of the total volume in January.

Initially, 50 companies were included into the sample with 300 observations; however after the precise assessment procedures 5 companies were excluded from the final sample and 30 observations were removed. In the final stage 45 companies were selected as a core sample for the thesis research, companies were divided into several extracting sectors (Figure 14), according to their main operating activities. Full final sample and description are presented in Appendix 1.

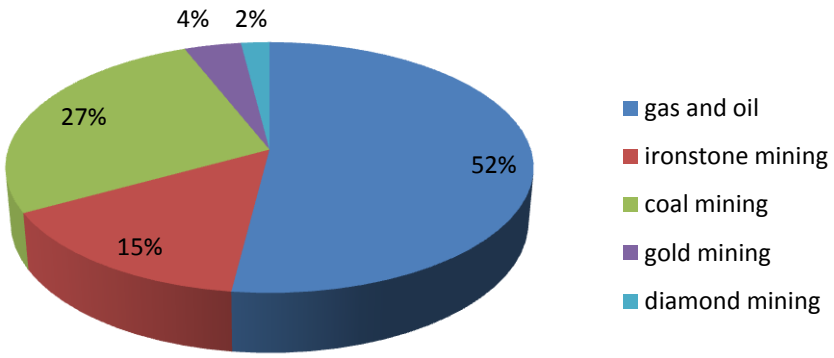


Figure 14. Company's operating segments

According to the figure above, companies operated in gas and oil extracted sector have occupied the major part of the sample, what is equal to 52% out of 45 companies. Coal and mining sector compiles 27% and takes the second place among the company's operating segments. Ironstone mining segment is represented just 15%. Two final segments are taken by gold mining and diamond mining segments and consist less than 3% out of the sample.

6. EMPIRICAL RESULTS

6.1. Preliminary procedures of the data

In order to conduct the panel regression analysis, gathered data of Russian extracting companies has been monitored, filtered and cleaned (Hair et al. 2010). After these procedures the major assumptions of multivariate techniques were satisfied, description of them is expounded below.

In the first place, the data for the research were assessed for the absence of mistakes, which was done by visual screening. Consequently the abnormal variables were excluded from the sample, since this variables cause an effect on the final results. The data was presented graphically: box-plots and histograms, it made possible to visualize abnormal values and remove it from the sample. Additionally, the effect of the abnormal values on the mean was examined with the trimmed mean in terms of 5%, mean value of the variables excluding the lower and upper 5% of sample. The data which had outliers was standardized, according to the value for standard deviation: +/– 3 or outside the required values (Pallant 2007). When all abnormal values were eliminated from the preliminary sample, 45 companies with 270 observations were included in the panel regression analysis.

To test the major hypotheses and provide a relevant justification to the research questions three econometric models were constructed: internal factors model, external factors model and the model of composed factors. All these models are designed based on the findings from the previous academic papers. Several previous scientific tractates used fixed assets and company's sales as control variables for the size of company's capital expenditures (Larcker 1983; Fazzari and Athey 1987; Newman 1989). The structural relationships between sales and CAPEX were assessed by Eisner in 1967, who suggested that company's output and CAPEX have to be in equal proportion to each other. Lev and Sunder (1979) utilized the change in company's sales as the independent variable in the model for capital expenditures. The master's thesis conducted the research with company's sales as an independent variable, based on the recommendations by Fazzari and Athey (1987) and Abel and Blanchard (1986).

The panel regression analysis enables to assess the effect of independent factors on the dependent factor. In the first row, control variables must be incorporated into the model,

and then predictor variables must be attached to the model. To express the fluctuation of the dependent variable the alteration of R-Square need to be observed which reflects the participation of the predictor variables (Hair et al. 2010).

6.2. Model of firm's level factors

The correlation between CAPEX and company's level factors is the first model, which tests the hypothesis. The model's regression equation looks as follows:

Formula1. MFLF regression equation

$$CAPEX_{j,t} = \beta_0 + \beta_1 CAPEX_{j,t-1} + \beta_2 GS_{j,t-1} + \beta_3 ROA_{j,t-1} + \beta_4 FCF_{j,t-1} + \beta_5 LTD_{j,t-1} + \beta_6 TD_{j,t-1} + \varepsilon_{j,t},$$

where:

$CAPEX_{j,t}$ = company's capital expenditures j, made in the t period;

$CAPEX_{j,t-1}$ = company's capital expenditures j, made in the previous period (t-1);

$GS_{j,t-1}$ = company's sales growth j, made in the previous period (t-1);

$ROA_{j,t-1}$ = company's return on assets j, made in the previous period (t-1);

$FCF_{j,t-1}$ = company's free cash flow j, made in the previous period (t-1);

$LTD_{j,t-1}$ = company's long term debt, made in the previous period (t-1);

$TD_{j,t-1}$ = company's total debt, made in the previous period (t-1);

β_{0-6} = unknown parameters;

$\varepsilon_{j,t}$ = random variable;

j = company's number;

t = time point.

Company's capital expenditures *j* in the time point *t* acts as the dependent variables, conversely, CAPEX (t-1), GS, ROA and FCF are the independent variables. The last two independent variables – long term debt and total dept are control variables of the model. Table 12 represents description of the variables and methods of calculation, which were used in the model.

Table 12. Measuring methods of firm's level variables

Variable	Description
Dependent variable	
$CAPEX_t$	*Definition:* **CAPEX** can be defined as funds implemented to acquire fixed assets and do not belong to funds for acquisition purpose. It consists of: additions to PPE (property, plant and equipment), investments in equipment and machinery. $$CAPEX_t = \frac{CAPEX_{j,t}}{Total\ assets_{j,t-1}}$$ where: *Total assets* - sum of long term receivables, total current assets, net property plant and equipment, investment in unconsolidated subsidiaries, other investments and assets.
Independent variables	
$CAPEX_{j,t-1}$	*Definition:* the same variable as CAPEX, but calculated for the previous operation year. $$\mathrm{CAPEX_{j,t-1}} = \frac{\mathrm{CAPEX_{j,t-1}}}{\mathrm{Total\ assets_{j,t-2}}}$$
$GS_{j,t-1}$	*Definition:* **GS** represent changes in sales between two time periods. $$GS_{j,t-1} = \frac{Sales_j - Sales_{j,t-1}}{Sales_{j,t-1}}$$ where: *Sales* – sum of the interim net sales/revenue reported in the last twelve months
Variable	**Description**
Independent variables	
$ROA_{j,t-1}$	*Definition:* **ROA** reflects how efficient management uses company's assets to generate maximum earnings. $ROA_{j,t-1}$ = *(Net Income before Preferred Dividends + ((Interest Expense on Debt – Interest Capitalized)*(1-Tax Rate)/Last Year's*

	*Total Assets*100*
$FCF_{j,t-1}$	*Definition*: **FCF** represents the cash earnings, total dividends paid and net of capital expenditures of the company. $FCF_{j,t-1} = \frac{Funds\ from\ Operations - CAPEX - Cash\ Dividends\ Paid}{\text{Total assets}_{\text{j,t}-1}}$
Control variables	
$LTD_{j,t-1}$	*Definition*: **LTD** represents rate of long term liabilities in company's total assets. $LTD_{j,t-1} = \frac{Long\ term\ debt_{j,t}}{\text{Total assets}_{\text{j,t}-1}}$ where: *LTD* represents all interest bearing financial obligations, excluding amounts due within one year.
$TD_{j,t-1}$	*Definition*: **TD** represents rate of total debt in company's total assets. $TD_{j,t-1} = \frac{Total\ debt_{j,t}}{\text{Total assets}_{\text{j,t}-1}}$ where: *TD* represents all capitalized lease and interest bearing obligations. It's the sum of short term debt and long term debt.

The table 13 presents maximum, minimum, standard deviation, mean and number of observations of variables that were used in the panel regression analysis for the first part of the thesis research.

Table 13. Descriptive statistics

Variable	**Firm's level factors for Russian extracting companies**				
	Mean	Std.Dev.	Min	Max	N
CAPEX	0.085	0.065	0	0.251	270
CAPEX (t-1)	0.091	0.071	0	0.310	270
GS	0.099	0.237	-0.518	0.742	270
ROA	5.623	7.152	-13.3	22.94	270

FCF	0.004	0.077	-1.188	0.195	270
LTD	0.245	0.192	0	0.761	270
TD	0.120	0.129	0	0.486	270

According to the information presented above it is possible to notice a big difference between minimum and maximum values of the variable - return on assets, that fact allows to make an assumption on company's efficiency and operation performance. A set of companies in the sample demonstrates high performance over the long period of time; however other companies stay in a deep stagnation situation, which leads to the low financial performance and ineffective resource allocation. For example, the maximum value of return on assets is 22.94 while the minimum value is -13.3.

The indicators reflecting company's financial stability are LTD and TD. The maximum value of LTD is 76%, while the mean is 24%, which shows that the leverage in the company's balance sheet is relatively low. A current situation can be instigated by overstated credit rates and strict requirements to a potential loan debtor from the bank side.

Company's level factors

First of all, the panel regression analysis for firm's level factors was divided into two sub parts. In the first step, the fixed effects model was assessed. According to the results in table 14, the model with fixed effects is significant p <, 0001 and can be used as explanatory model.

Table 14. Fixed one way estimates: company's level factors

Model description			
Estimation method		FixOne	
Number of cross sections		45	
Time series length		6	
Fit statistics			
SSE	0.506	DFE	219
MSE	0.002	Root MSE	0.048

R-Square	0.676		
F test for no fixed effects			
Num DF	Den DF	F Value	Pr>F
44	219	2.66	<.0001

The R-Square in the model with fixed effects is 0.6762, which means that the model explains 67.6% of changes in the sample of Russian extracting companies. The outcome of the panel regression analysis of the interaction between CAPEX and firm's level factors in Russian extracting companies presented in table 15.

Table 15. Outcome of panel regression analysis: firm's level factors

CAPEX	**Firm's level factors for Russian extracting companies**			
	Estimate	Std.Dev.	t Value	Pr>[t]
CAPEX (t-1)	0.253***	0.038	6.51	<.0001
GS	0.038**	0.013	2.87	0.0046
ROA	0.002***	0.001	3.91	0.0001
FCF	-0.073*	0.038	-1.89	0.0600
LTD	0.084**	0.034	2.41	0.0170
TD	-0.048	0.037	-1.29	0.1986
* significance on level p<0.1; ** significance on level p<0.05; ***significance on level p<0.01.				

The outcome of the panel regression model demonstrates that almost all firm's level factors, except for TD, have effect on the dependent variable CAPEX. Two variables have the highest level of impact: CAPEX (t-1) and ROA. The variable – FCF (p<0.1) has negative relationship with CAPEX, which means that an increase of free cash flow leads to decrease of company's CAPEX. According to the formula of FCF, CAPEX already included in calculation process, low CAPEX leads to a high value of FCF.

In the second step, the random effect model was tested. According to the results in table 16, the model with random effects is insignificant and cannot be used as an explanatory model.

Table 16. Random one way estimates: company's level factors

Model description			
Estimation method		RanOne	
Number of cross sections		45	
Time series length		6	
Fit statistics			
SSE	0.618	DFE	263
MSE	0.002	Root MSE	0.048
R-Square	0.379		
Variance component estimates			
Variance component for cross sections			0.001
Variance component for error			0.002
Hausman test for random effects			
DF	m Value		Pr>m
6	33.39		<.0001

The result of Hausman test is p <.0001, it means that model with random effects is rejected and only model with fixed effects can be used for the interpretation of firm's level factors effects.

6.3. Model of macroeconomic factors

The correlation between CAPEX and company's macroeconomic factors is the second model, which tests the hypothesis. The model's regression equation looks as follows:

Formula1. MMF regression equation

$$CAPEX_{j,t} = \beta_0 + \beta_1 GDP_{j,t-1} + \beta_2 Export_{j,t-1} + \beta_3 Urals_{j,t-1} + \beta_4 RF_{j,t-1} + \beta_5 D/R_{j,t-1} + \varepsilon_{j,t},$$

where:

$CAPEX_{j,t}$ = company's capital expenditures j, made in the t period;

$GDP_{j,t-1}$ = Russian monetary value of produced finished services and goods j, made in the previous period (t-1);

$Export_{j,t-1}$ = Russian monetary value of exported finished services and goods j, made in the previous period (t-1);

$Urals_{j,t-1}$ = price of Russian export brand oil j, made in the previous period (t-1);

$RF_{j,t-1}$ = part of the federal budget assets j, made in the previous period (t-1);

$D/R_{j,t-1}$ = Dollar/Ruble weighted mean currency exchange rate j, made in the previous period (t-1);

β_{0-5} = unknown parameters;

$\varepsilon_{j,t}$ = random variable;

j = company's number;

t = time point.

Company's capital expenditures *j* in the time point *t* acts as the dependent variables, conversely, GDP, Export, Ural, The Reserve Fund and Dollar/Ruble are the independent variables. Table 17 represents a description of the variables and methods of calculation, which were used in the model.

Table 17. Measuring methods of macroeconomic factors

Variable	Description
Dependent variable	
$CAPEX_t$	*Definition:* **CAPEX** can be defined as funds implemented to acquire fixed assets and do not belong to funds for acquisition purpose. It consists of: additions to PPE (property, plant and equipment), investments in equipment and machinery. $$CAPEX_t = \frac{CAPEX_{j,t}}{Total\ assets_{j,t-1}}$$ where: *Total assets* - sum of long term receivables, total current assets, net property plant and equipment, investment in unconsolidated subsidiaries, other investments and assets.
Independent variables	
$GDP_{j,t-1}$	*Definition:* **GDP** reflects Russian economic health and represented as monetary amount of all finished services and goods produced in Russian borders within a year.

	$$GDP_{j,t-1} = \frac{GDP_{j,t} - GDP_{j,t-1}}{GDP_{j,t}}_{j,t-1} * 100$$ where: *GDP* – total ruble value of all services and produced goods per annum, represented in RUB bn.
$Export_{j,t-1}$	*Definition:* **Export** reflects services and produced goods in a particular country, which were shipped to another country for trade and sales. $$Export_{j,t-1} = \frac{Export_{j,t} - Export_{j,t-1}}{Export_{j,t-1}}$$ where: *Export* – total dollar value of all services and produced goods per annum, which were sold to another country, represented in dollar bn.
$Urals_{j,t-1}$	*Definition:* **Urals** is oil brand for or the Russian export oil blend. $$Urals_{j,t-1} = \frac{Urals_{j,t} - Urals_{j,t-1}}{Urals_{j,t-1}}$$ where: *Urals* – annual average price for the Russian export oil blend, per barrel in the dollar equivalent.
$RF_{j,t-1}$	*Definition*: **RF** (The Reserve Fund) represents a part of the federal budget assets of Russia, services to support stable social economic development of Russia. $$RF_{j,t-1} = \frac{Reserve\_Fund_{j,t} - Reserve\_Fund_{j,t-1}}{Reserve\_Fund_{j,t-1}}$$ where: *Reserve fund* – total amount of finance per annum, represented in RUB bn.

$D/R_{j,t-1}$	*Definition*: **D/R** reflects exchange rate between dollar and ruble. $$D/R_{j,t-1} = \frac{Dollar/Ruble_{j,t} - Dollar/Ruble_{j,t-1}}{Dollar/Ruble_{j,t-1}} * 100\%$$ where: *Dollar/Ruble* - annual average exchange rate between dollar and ruble.

Company's macroeconomic factors

The macroeconomic factors were assessed using the same methodological process. The fixed effects model was implemented in the first row. The outcome of the model is presented in table 18, the model with fixed effects for external factors is significant p <. 0001 and can be used as an explanatory model.

Table 18. Fixed one way estimates: macroeconomic factors

Model description			
Estimation method		FixOne	
Number of cross sections		45	
Time series length		6	
Fit statistics			
SSE	0.630	DFE	220
MSE	0.002	Root MSE	0.053
R-Square	0.596		
F test for no fixed effects			
Num DF	Den DF	F Value	Pr>F
44	220	6.69	<.0001

The R-Square in the model for external factors with fixed effects is 0.5964, which means that the model explains 59.6% of changes in the sample of Russian extracting companies. The outcome of the panel regression analysis of the interaction between CAPEX and macroeconomic factors in Russian extracting companies presented in table 19.

Table 19. Outcome of panel regression analysis: macroeconomic factors

CAPEX	**Macroeconomic factors for Russian extracting companies**			
	Estimate	Std.Dev.	t Value	Pr>[t]
GDP	-0.149***	0.034	-4.31	<.0001
Export	5.774***	1.369	4.22	<.0001
Urals	-2.924***	0.718	-4.07	<.0001
RF	0.3148***	0.072	4.36	<.0001
D/R	0.001	0.013	0.16	0.8760
* significance on level p<0.1; ** significance on level p<0.05; ***significance on level p<0.01.				

The results of the panel regression model show that almost all internal factors, except for D/R, have an effect on the dependent variable and statistically significant at 1%. Two factors have negative relationship with CAPEX: GDP and Urals. CAPEX becomes lower, if the value of GDP or Urals demonstrates growth.

The random effect model for the external factors was assessed as a second step. According to the results in table 20, the random effect model is significant and can be used as explanatory model too.

Table 20. Random one way estimates: macroeconomic factors

Model description			
Estimation method		RanOne	
Number of cross sections		45	
Time series length		6	
Fit statistics			
SSE	0.687	DFE	264
MSE	0.002	Root MSE	0.051
R-Square	0.114		
Variance component estimates			
Variance component for cross sections			0.006
Variance component for error			0.002

Hausman test for random effects		
DF	m Value	Pr>m
5	0.00	1.0000

The R-Square in the model for external factors with random effects is 0.1142, which means that the model explains only 11.4% of changes in the sample of Russian extracting companies. The outcome of the panel regression analysis of the interaction between CAPEX and external factors in Russian extracting companies presented in table 21.

Table 21. Outcome of panel regression analysis (RE): macroeconomic factors

CAPEX	Macroeconomic factors for Russian extracting companies			
	Estimate	Std.Dev.	t Value	Pr>[t]
GDP	-0.149***	0.0122	-4.52	<.0001
Export	5.774***	0.033	4.42	<.0001
Urals	-2.924***	1.305	-4.27	<.0001
RF	0.314***	0.684	4.46	<.0001
D/R	0.001	0.012	0.16	0.8699
* significance on level p<0.1; ** significance on level p<0.05; ***significance on level p<0.01.				

Both panel regression models for macroeconomic factors demonstrate the same results, with low level of changes in the variables. Such results can be explained by the range of external factors, which are the same for all companies and cause an equal effect on the company's CAPEX. A comparison of two panel regression models for macroeconomic factors with random and fix effects, allows to select more preferable explanatory model. Model with fix effects has higher explanatory power - R-Square – 0.5964, compared with the random effects model - R-Square – 0.1142. Based on the results of R-Square we can select fix effects model as the major explanatory model for macroeconomic factors.

6.4. Model of Combined factors

The correlation between CAPEX and combined factors is the third model, which tests the hypothesis. The model's regression equation looks as follows:

Formula1. MCF regression equation

$$CAPEX_{j,t} = \beta_0 + \beta_1 GDP_{j,t-1} + \beta_2 Export_{j,t-1} + \beta_3 Urals_{j,t-1} + \beta_4 RF_{j,t-1} + \beta_5 D/R_{j,t-1} + \beta_6 CAPEX_{j,t-1} + \beta_7 GS_{j,t-1} + \beta_8 ROA_{j,t-1} + \beta_9 FCF_{j,t-1} + \beta_{10} LTD_{j,t-1} + \beta_{11} TD_{j,t-1} + \varepsilon_{j,t},$$

where:

$CAPEX_{j,t}$ = company's capital expenditures j, made in the t period;

$GDP_{j,t-1}$ = Russian monetary value of produced finished services and goods j, made in the previous period (t-1);

$Export_{j,t-1}$ = Russian monetary value of exported finished services and goods j, made in the previous period (t-1);

$Urals_{j,t-1}$ = price of Russian export brand oil j, made in the previous period (t-1);

$RF_{j,t-1}$ = part of the federal budget assets j, made in the previous period (t-1);

$D/R_{j,t-1}$ = Dollar/Ruble weighted mean currency exchange rate j, made in the previous period (t-1);

$CAPEX_{j,t-1}$ = company's capital expenditures j, made in the previous period (t-1);

$GS_{j,t-1}$ = company's sales growth j, made in the previous period (t-1);

$ROA_{j,t-1}$ = company's return on assets j, made in the previous period (t-1);

$FCF_{j,t-1}$ = company's free cash flow j, made in the previous period (t-1);

$LTD_{j,t-1}$ = company's long term debt, made in the previous period (t-1);

$TD_{j,t-1}$ = company's total debt, made in the previous period (t-1);

β_{0-11} = unknown parameters;

$\varepsilon_{j,t}$ = random variable;

j = company's number;

t = time point.

Company's capital expenditures *j* in the time point *t* acts as the dependent variables, conversely, GDP, Export, Ural, RF, D/R, CAPEX (t-1), GS, ROA and FCF are the independent variables. The last two independent variables – long term debt and total dept are control variables of the model. The description of the variables and methods of calculation, which were used in the third model are the similar to the first two models and presented in details in the previous tables.

Company's internal and external factors

In the final stage of the research, the panel regression analysis for macroeconomic and firm's level factors was combined together and assessed. In the first run, the fixed effects model with combined range of variables was tested. According to results in table 22, the model with fixed effects is significant p <, 0001 and can be used as an explanatory model.

Table 22. Fixed one way estimates: combined factors

Model description			
Estimation method		FixOne	
Number of cross sections		45	
Time series length		6	
Fit statistics			
SSE	0.489	DFE	214
MSE	0.002	Root MSE	0.047
R-Square	0.686		
F test for no fixed effects			
Num DF	Den DF	F Value	Pr>F
44	214	2.74	<.0001

The R-Square in the model with fixed effects is 0.686, which means that the model explains 68.6% of changes in the sample of Russian extracting companies. The interaction between CAPEX and combined factors in Russian extracting companies is presented in the panel regression analysis in table 23.

Table 23. Outcome of panel regression analysis: combined factors

CAPEX	**External and internal factors for Russian extracting companies**			
	Estimate	Std.Dev.	t Value	Pr>[t]
GDP	-0.063*	0.035	-1.79	0.0745
Export	2.440*	1.396	1.75	0.0820
Urals	-1.226*	0.729	-1.68	0.0938

RF	0.138*	0.073	1.88	0.0613
D/R	-0.001	0.001	-0.40	0.6919
CAPEX (t-1)	0.227***	0.041	5.48	<.0001
GS	0.036**	0.015	2.35	0.0197
ROA	0.002***	0.001	3.49	0.0006
FCF	-0.068*	0.039	-1.76	0.0790
LTD	0.064*	0.036	1.77	0.0779
TD	-0.028	0.040	-0.70	0.4837
* significance on level p<0.1; ** significance on level p<0.05; ***significance on level p<0.01.				

The outcome of the panel regression model demonstrates that two variables have no impact on the dependent variable: TD and D/R. However, only three variables statistically are significant at 1%: CAPEX (t-1), GS, and ROA. All these variables belong to the group of firm's level factors. Macroeconomic factors are statistically significant at 10% level, which may indicates that economic conditions do not cause any serious effect on company's CAPEX.

The random effect model was tested for combined variables as the second model. According to the results in table 24, the model with random effects is insignificant and cannot be used as an explanatory model.

Table 24. Random one way estimates: combined factors

Model description			
Estimation method		RanOne	
Number of cross sections		45	
Time series length		6	
Fit statistics			
SSE	0.604	DFE	258
MSE	0.002	Root MSE	0.048

R-Square	0.392		
Variance component estimates			
Variance component for cross sections			0.001
Variance component for error			0.002
Hausman test for random effects			
DF	m Value		Pr>m
5	86.53		<.0001

The result of Hausman test is p <.0001, it means that model with random effects is rejected and only model with fixed effects can be used for the interpretation of combined factors effects.

Summary

The interrelations between company's CAPEX, firm's level factors and macroeconomic factors were conducted through the empirical research. The data of Russian extracting companies were used as example of developing country. The major strategy of the thesis research is panel recessional modes. The company's financial data was collected through the analytical data basis: Thompson one and Amadeus data stream. The official company's web sites provided additional financial information, eliminated gaps and uncertainty.

Three panel recessional modes were used as the main statistical method for the company's data. The fixed and random effect models allowed to precisely estimated power of the independent variables. The ranges of result were obtained through the thesis research:

- CAPEX is positively connected with company's CAPEX of the previous year, growth sales, return on assets and long term debt. However, increase of free cash flow reduces company's CAPEX;
- Growth of Russian macroeconomic factors cause positive effect on company's CAPEX: export and reserve found. Growth of Russian GDP and price of Urals oil blend have negative impact on company's CAPEX.

- In the combined factors model CAPEX has positive relationships only with internal factors, which may indicates that Russian extraction companies are not vulnerable to macroeconomic factors.

The table 25 presents summery of determinants significantly affect both positively and negatively on CAPEX.

Table 25. CAPEX determinants

Determinants of Company's CAPEX							
Macroeconomic factors				**Firm-level factors**			
GDP	0.149***		Affect negatively	CAPEX (t-1)	0.253***	Affect positively	
Export	5.774***	Affect positively		GS	0.038**	Affect positively	
Urals	2.924***		Affect negatively	ROA	0.002***	Affect positively	
RF	0.314***	Affect positively		FCF	0.073*		Affect negatively
				LTD	0.084**	Affect positively	
* significance on level p<0.1; ** significance on level p<0.05; ***significance on level p<0.01.							

7. DISCUSSION

The major goal of the thesis is to identify the significant macroeconomic and firm level determinants of CAPEX in Russian oil and mining sector. The context of research is confined by strict framework, and Russia acts as an example of the emerging market. The research case is confined by strict framework, the main research question was split into several sub-questions, and in the empirical part of the research three hypotheses were assessed. The major findings of the research were consolidated into several groups, providing substantiated responses to the questions.

Question 1: What independent variables cause impact on the company's capital expenditures in the model with internal factors?
Question 2: What are the firm level performance variables that determine the magnitude of new capital expenditures reported by publicly listed Russian oil and mining sector companies?

In order to answer the first group of questions, the model of internal factors has been analyzed. The outcome of the panel data analysis of the sample of Russian oil and mining companies directly correlates with return on assets, long-term debt, capital expenditures of the previous year, sales growth and inversely correlates with free cash flow.

The previous research papers in this area have obtained the similar results implementing range of distinct samples and environmental conditions (e.g., Fazzari, Hubbard and Petersen 1988; Sanjai and Welch 1995; Teplova 2007; Serrasqueiro, Mendes and Nunes 2000; Mustapha and Chyi 2010; Cherkasova and Smirnova 2012). However, most research papers analyzed companies operating in developed countries, whereas companies operating in emerging markets have not been analyzed enough. Thus, this research paper, which has depicted the significant firm level determinants of CAPEX in Russian oil and mining sectors, contributes to the new area of CAPEX research in emerging countries. The major determinants of CAPEX in Russia are the same as in Malaysia, India and Portugal (Serrasqueiro, Mendes and Nunes 2000; Bhattacharyya 2009, Mustapha and Chyi 2010).

The direct positive relationship between sales growth and CAPEX can be interpreted by the fact that the companies with relatively high level of financial recourses are way more stable and successful, able to invest in PPE and expand its production capacity. This

characteristics allows the entity to develop new oil field and modernize production facilities, which results in the growth of revenue. The indirect correlation between CAPEX and company's free cash flow may be explained by the fact that the formula of calculation this variable includes CAPEX as part of the calculation process. If CAPEX in the formula increases, then the final value of FCF becomes lower. The insignificant variable can also be interpreted by the internal nature of CAPEX. The short-term debt does not provide financial resources for the long period of time. More than one year payback period is essential characteristics for the investment project in the oil and mining sectors.

Question 3: What independent variables cause impact on the company's capital expenditures in the model with external factors?
Question 4: What are the macroeconomic indicators that determine the magnitude of new capital expenditures reported by publicly listed Russian oil and mining sector companies?

In order to answer the second group of questions, the model of external factors has been analyzed. CAPEX variable in the panel data analysis of the sample of Russian oil and mining companies directly correlates with export, reserve fund and inversely correlates with Urals and GDP. The export variable reflects the amount of oil export to the CIS and non-CIS countries. The stable growth of oil exports in the recent years along with high oil prices, allowed companies to increase revenue and operational profit. Such favorable conditions instigate companies to increase rate of the investment rate in the fixed assets.

The Reserve Fund is a component of the state budget assets. It was established to provide the stable economic and national development; it reduces volatility of oil and gas exports earning. It is formed through the oil taxes and export tariffs on oil and gas. The funds of the Reserve Fund may be allocated to finance gas and oil transfers, which allows oil and gas companies to form revenue plan, despite the price volatility and market uncertainty. Such stability in prices enables oil and gas companies to take the long-time investment projects (Reserve Fund Reports 2015).

The Urals and GDP demonstrate a contradictious effect on the company's CAPEX. Several reasons can cause this effect. The data sample embraces a set of companies, which are heterogeneous with different operational sectors. Only 52% of companies in the data set relate to the oil and gas sector, rest of the sample is mining firms. The sharp increase of hydrocarbon prices, leads to escalation of costs for mining companies. The research was focused on Russian extracting companies that also have its own impact on

the results. The mentality of the management in the selected sample is specific. The investment during the flush times extrinsic for them and can show the converse effect.

For completeness of the research results the model of combined factors has been analyzed. CAPEX variable in the panel data analysis of the sample of Russian oil and mining companies directly correlates with capital expenditures of previous year, return on assets and growth sales. These three variables refer to the group of internal factors. The set of external factors does not demonstrate a strong relationship with the dependent variable, in spite of the fact that, variables such as, export and Urals have implicit relationship with CAPEX. The results of the panel data indicate non-responsiveness to the external factors, regardless of it characteristics. The internal factors present a strong correlation in all models, where they were used, which is not true for external factors. As can be seen from the results, Russian oil and mining companies heavily rely on company's performance indicators, such as sales and return on assets, during the process of decision making. The national economic situation does not cause effect on the decision process, the same as currency rate and exports volume.

8. CONCLUSION

The master's thesis was elaborated to identify the significant macroeconomic and firm level determinants of CAPEX in Russian oil and mining sector. Quantitative method was utilized as a basic approach for the research methodology. Three different models were incorporated into the panel regression analysis in order to obtain the sufficient results and provide explanations for the research questions.

The annual financial data about publicly listed Russian oil and mining sector companies has been gathered via Thomson Reuters analytical database and Amadeus data stream. Initially, 50 companies were included into the sample with 300 observations; however after the precise preliminary procedures 5 companies were excluded from the final sample and 30 observations were removed. In the final stage 45 companies were selected as a core sample for the thesis research.

Three regression's equations were formulated and separately tested. The results of regression models detected, that GS, ROA, FCF and LTD are firm level performance variables along with GDP, Export, Urals and RF are macroeconomic variables that determine the magnitude of new capital expenditures reported by publicly listed Russian oil and mining sector companies. These results are not controversial to the previous research paper, indeed confirm them (e.g., Gordon and lyengar 1995; Teplova 2007; Waegelein 2014). Furthermore, the findings from the emerging countries, such as Malaysia, India and Portugal, are analogous to Russia (Serrasqueiro, Mendes and Nunes 2000; Bhattacharyya 2009; Mustapha and Chyi 2010).

The extended core sample may be considered in the future scientific papers (e.g. all companies listed in the Russian Trade System). The wide range of different companies, from various industries, would increase commensuration among them. Moreover, it supports all scientific tractates that were done before. It is also proved that company's investments are highly sensitive to different time periods. Thus, different time intervals could be incorporated in the future research – before, during and after the financial turmoil. This comparison could test the robustness of determinant of CAPEX.

In conclusion, findings from this master's thesis are highly valuable for the scientific community, especially, for researchers who investigates determinant of CAPEX in developing countries. Moreover, the results can be utilized as a cogent argument, when

companies and investors doing strategic decisions, considering Russian oil and mining sectors. The Russian Government, as well as, management could consider thesis results as a platform for further economic growth and sustainable development.

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APPENDICES

List of companies

Company Name	Sector
OAO Gazprom	Oil and gas sector
OAO ANK BASHNEFT	Oil and gas sector
OAO TATNEFT	Oil and gas sector
OAO NK ROSNEFT - DAGNEFT	Oil and gas sector
OAO Saratovneftegaz	Oil and gas sector
OAO Volgogradneftegeofysika	Oil and gas sector
OAO SARATOVNEFTEGEOFIZIKA	Oil and gas sector
OAO SPA "Burovaya technika"	Oil and gas sector
OAO Bashneftegeofizika	Oil and gas sector
OAO Balakovorezinotekhnika	Oil and gas sector
OAO Gazprom Promgaz	Oil and gas sector
ПАО Severstal	Ironstone mining
OAO Beloretskiy Metallurgicheskiy Kombinat	Ironstone mining
OAO Gai Mining and processing Co	Coal mining
OAO Southern Urals Nickel Plant	Ironstone mining
OAO Ruzhimmash	Oil and gas sector
OAO Belozersky LPH	Coal mining
OAO Novotroyitsky Ctement Zavod	Coal mining
OAO Solikamsk magnesium works	Oil and gas sector
OAO Usinskgeoneft'	Oil and gas sector
OAO Novolipetsk Steel	Ironstone mining
OAO MUROMTEPLOVOZ	Oil and gas sector
OAO Kovrov Electromechanical Plant	Oil and gas sector
OAO Novatek	Oil and gas sector
OAO Transneft	Oil and gas sector
OAO AK Alrosa	Diamond mining
OAO GMK Noril'skiy nikel'	Ironstone mining
OAO Magnitogorsk Iron & Steel Works	Ironstone mining
OAO Mechel	Coal mining
OAO Polyus Gold	Gold mining

OAO Raspadskaya	Coal mining
OAO Corporation VSMPO-AVISMA	Ironstone mining
OAO RN Holding	Oil and gas sector
OAO NK Rosneft'	Oil and gas sector
OAO Slavneft-Megionneftegas	Oil and gas sector
OAO Altaykraygazserv	Oil and gas sector
OAO Koks	Coal mining
OAO Kommunarovskiy gold mine	Gold mining
OAO Krasnoyarsk oil production	Oil and gas sector
OAO Novosibirskneftegaz	Oil and gas sector
OAO ORGENERGOGAZ	Oil and gas sector
OAO Primorskugol	Coal mining
OAO Sibir'gazservis	Oil and gas sector
OAO Yakutskaya Toplivno-Energeticheskaya Kompanya	Oil and gas sector