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The Russian Oil Could be this time a blessing?

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Abstract

This thesis aims at investigating the dependency of the Russian economy on natural resources, underlining the causes and the possible consequences of this growth model. The analysis tries to evaluate if the Russian manufacturing has contracted the “Dutch Disease”, that is, if a boom in the oil and gas industry has led to a process of de-industrialization, directly through the resource movement effect and indirectly through the spending effect. In this investigation I will emphasize the role played by the learning curves as a crucial factor in determining the comparative advantages of a country, and why an excessive reliance on exports revenues may reduce the welfare of a nation in the long run. To conclude I want to say that Russia is an incredible case study testifying how being rich of natural resource endowments should be a dream for the wealth of a country, but in the majority of the cases turns into a nightmare.

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List of Abbreviation

AHF: Agriculture, Hunting and Forestry

Bbl: Barrel

Bcm: Billion cubic meters

Bn: Billion

Bor: Bank of Russia

BP: British Petroleum

BRIC: Brazil, Russia, India, and China

Btu: British thermal unit

CIA: Central Intelligence Agency

CIS: Commonwealth of Independent States

EU-27: European Union

FDI: Foreign Direct Investment

GDP: Gross National Product

GRP: Gross Regional Product

IMF: International Monetary Fund

LNG: Liquefied Natural Gas

MIT: Massachusetts Institute of Technology

Mmt: Million Metric Tons

NEP: New Economic Policy

PGR: Proven Gas Reserves

POR: Proven Oil Reserves

PPP: Purchasing Power Parity

R&D: Research and Development

R/P: Reserve to Production Ratio

SOE: State Owned Enterprise

Tbd: Thousand barrels daily

Tcm: Thousand Cubic Meters

Tmb: Thousand Million Barrels

UK: United Kingdom

USA: United States of America

USSR: United Socialist Soviet Republic

VIM: Vehicles, Instruments and Machineries

WTI: West Texas Intermediate

WTO: World Trade Organization

Introduction

The matter of the thesis is the attempt to provide an analysis of the structural changes that the Russian economy has experienced in the last two decades. In particular, the attention is paid on the growth model that has been leading Russia to likely contract the “Dutch Disease”.

This phenomenon is commonly faced by countries abundant of natural resources, for which, their exports’ revenues of these commodities constitute more than 20 % of the gross domestic product. Some notable examples are: natural gas in Netherland, crude oil in the United Kingdom, Nigeria, Norway, and Middle East countries, and different kind of precious metals like gold in Australia, Canada and New Zealand.

The symptoms of this disease are a boom in the extractive sector, a gradual contraction of the manufacturing sector - the lagging sector - which is put under pressure by an overvalued currency, and a constant growth of the service sector which increases its weight in the economy. In the end the de-industrialization process happens inexorably both directly and indirectly, leading to a total dependence on the export of this commodity, without any possibility of coming back on track cause of the learning curves.

To verify if such a negative scenario fits Russia, the structure of the thesis has been planned as follows.

Chapter 1 - Historical perspective - aims at emphasizing the role played by the government in linking the destiny of Russia to the crude oil. This resource has been the main source of wealth not only during the recovery in 2000, but since the beginning of the XX century and during all the Cold War so that the collapse of its price and production in the 1990s have been the reason why Russia has faced a so deep recession lasted for more than ten years.

Chapter 2 - Rising dependency on exports and imports- introduces the descriptive analysis on Eurostat data concerning the Russia’s trade with the World and especially with the

European Union 27 between 2009 and 2010. In this section it will be confuted that the Russian foreign trade is totally based on the exports of oil, gas and metals, and that the share of manufactures exports as % of merchandise exports is clearly declining, emphasizing the loss of competitiveness of the domestic industry.

Chapter 3 - The Dutch Disease: a real threat? - is the core of the thesis. In this section, first of all, the theory concerning the Dutch Disease and the model developed by Max Corden and Peter Neary in 1982 will be applied to the Russian case. Secondly, I will empirically test if the Dutch Disease's symptoms are already working in the Russian economy. More precisely the first step will aim at verifying if the exchange rate has experienced a real appreciation, that is, if the Ruble is a commodity currency. The second step aims at investigating respectively the output growth by sectors, the percentage change of the people employed by sectors, and the nominal monthly wages by kind of economic activities. Ultimately the role played by the foreign direct investments in the production of these idiosyncrasies will be analyzed.

Chapter 4 - Rising threats to growth sustainability - aims at critically appraise the growth path pursued by Russia. Here a comparison will be made with the Chinese model, which is useful to underline the weaknesses of the Russian one. The analysis will focus on the oil and natural gas reserves, investigating the possible ways out to an incoming oil depletion. At the end possible scenarios will be envisaged.

Finally the last section summarizes all the principal conclusions of the thesis.

The Russian case is a really interesting case-study to understand whether the abundance of natural resources is a blessing or not.

Chapter 1

Historical Perspective

1.1 The dawn of the oil age: URRS, an energy superpower

The story about Russian oil started in 1860 when the Baku's oil-well was for the first time exploited. Already at that time - following the recent accurate reconstruction of Marshall Goldman(2008) - in St. Petersburg existed a market for kerosene and the competition to drill and pump petroleum was getting always wider. In 1873 the foreign company, the Swede Robert Nobel started to produce, refine and market the Baku petroleum according to a new technique, and in 1887 it succeeded in extracting 2 million tons, almost double the quantity of the previous years.

The oversea competitor, the United States, the first World oil producer, led by its major producer John D. Rockefeller, dominated the market, and thanks to a production of 1.4 million metric tons higher than the Russian one, started to export the commodity all around the world¹. Russia to boost its domestic production and to curb Russian imports of American kerosene, increased strongly the import tariffs on petroleum products, and it was the beginning of a long exchange of strategic snip-snap that is going to surround the history of this commodity. In 1888 the Russian oil exports were relatively more important than the American ones only in Asia. In fact United States exported 75 % of its surplus to Europe and only a 16 % to Asia, against respectively a 59 % and 38 % of Russia². In the first year of 1900 Russia for the first time, and not the last, as we will see further, became the first oil producer in the world with a production of 11.987 million metric tons, almost 2 million higher than the United States. In those years the level of oil exports reached the peak level of 22 % of the total production, and for Russia it was a period of big earnings, but unfortunately for the Russians it lasted for few years. The Russian technique to exploit the oil was old and inefficient, they used wooden tools, and not metal, so as they couldn't drill deeper than 300

¹ Marshall I. Goldman, *Petrostate: Putin, Power, and the New Russia*, Oxford, University Press, 2008, p. 17

² Ivi., p.20

feet. In comparison the American companies were able to extract more than 1800 feet deeper³. This reasonably led to a cut of Russian production and exports, and the Bolshevik Revolution of 1917 made the rest.

A long period of oil stagnation surrounded Russia till twelve years later when the production passed to a new peak of 13.7 Million Metric Tons in 1929, another of 18,5 in 1930 and 22,4 in 1931. The total oil exports amounted to almost 20 % of the total production, and they satisfied the 17 % of the Western European demand⁴.

The Soviets controlled all the oil production chain by the Supreme Council of the National Economy thanks to three operating trusts: Azneft, Grozneft and Embaneft. These three entities acted like one and promoted the oil exports and other foreign activities. Lenin was the first that understood the importance of oil as an export commodity to improve the economic condition of the Russian Federation. His first goal was to apply the New Economic Policy as a strategy to re-launch the economy after its stagnation thanks to its main export, the crude oil.

The NEP was important in the oil-boom because it authorized to extend the concessions to drill the new oil fields to foreign companies. Lenin's strategy funded its ideas on the fact that nationalization of private property and the expulsion of foreigners companies was a great mistake, and that without the help of foreigners, exploiting the oil wells would have resulted impossible. As we will see, during history all the governments that will follow in this country will use always this same technique. Once the output had recovered thanks to the Western aids, as in 1930, the majority of the foreign companies were expelled and the concessions were revoked as it had happened in 1917. Once Lenin got the knowledge about the new technologies, the Western companies were not anymore welcome. This practice will remain a main characteristic of Russian politic strategy, in fact as we will see further on, the main performer will be just President Putin, who came to the power in 2000.

³ Ivi, p. 22

⁴ Ivi, p. 26

The communist party in those years understood that the earnings were linked to the production, but still more to the price, which was fixed by exogenous forces as supply and demand. According to Goldman, Russia in 1930 was more inclined to use its export commodity not for political purposes as the soviet government sustained, but for the windfall of profits. The oil exports already at that time counted for 18 % of the total foreign earnings⁵. But with the 1930's oil-glut the price collapsed and the Russian wealth fell as well. The price remained around the level of 2-3\$ per barrel with rises and falls till the first oil shock in 1973 when it had an increase of almost 300% passing from 3 \$ per barrel to 12 \$ on average⁶. That was the first time in which the oil was used as a weapon to blackmail the West, and it was the most important moment for Russia to show again its hidden energy power on the global scene.

During the second War World, Russia, due to Hitler's invasion, lost a big part of its production, almost 40%, and it had to sustain big expenditures to recover to the previous level. When the output of its main oil field, the Volga-Ural, began to decrease, the need to increase the level of production led to the discovery and exploitation of new oil-wells in the West Siberia Tiumen Region. To understand the importance of this exploitation, in 2007 this region that is divided into 2 other districts, Khanty-Mansiysk and Yamalo-Nenets, accounted for almost the 90 % of the natural gas and the 60 % of oil resources, respectively 4,5 % and 57 %, and 86 % and 9 %⁷. This was the main discovery till the oil-field in the Volga-Ural area. However the backwardness in the drilling and pumping techniques was always evident, in fact Russia lost big part of its oil revenues cause of its inefficiency.

This will be a recurring characteristic of the soviet system, lagging always behind the western companies. This is a problem still present nowadays, and it will be explained in details later on. A possible rough explanation of this technology and innovation's narrowness could be found in the central planning system where it has been always lacking of economic

⁵Ivi, p. 32

⁶I. Skeet, *Opec: twenty-five years of prices and politics*, Cambridge, Cambridge University Press, 1988, p. 104

⁷Deutsche Bank Research, the Russian regions, September 18, 2009

incentives and creative thinking, where the quantity was always preferred to the quality of the output⁸. This aspect of the Russian economic system that has almost always affected its main industry, the oil extraction till its dawn, is still stronger in other sectors that haven't represented and don't represent the higher windfall profits and that hasn't received the same huge flows of investments. Often this tendency produced consequent side-effects such as the necessity of imports technology from the West and the inability to rely on the local producers of goods and especially on the local high-tech sector.

The other choice in order to avoid this import-trap is to entrust the exploitation of the oil fields to Western companies, leaving the control of the supply of this strategic commodity to the foreigners and also losing a big part of the revenues. This will represent a path-dependency for the economic growth of Russian Federation, without the possibility to find another solution to this dilemma. As we will see its power has been and will be linked to this resource through the thick and thin, so as to be sometimes a blessing and sometimes a curse.

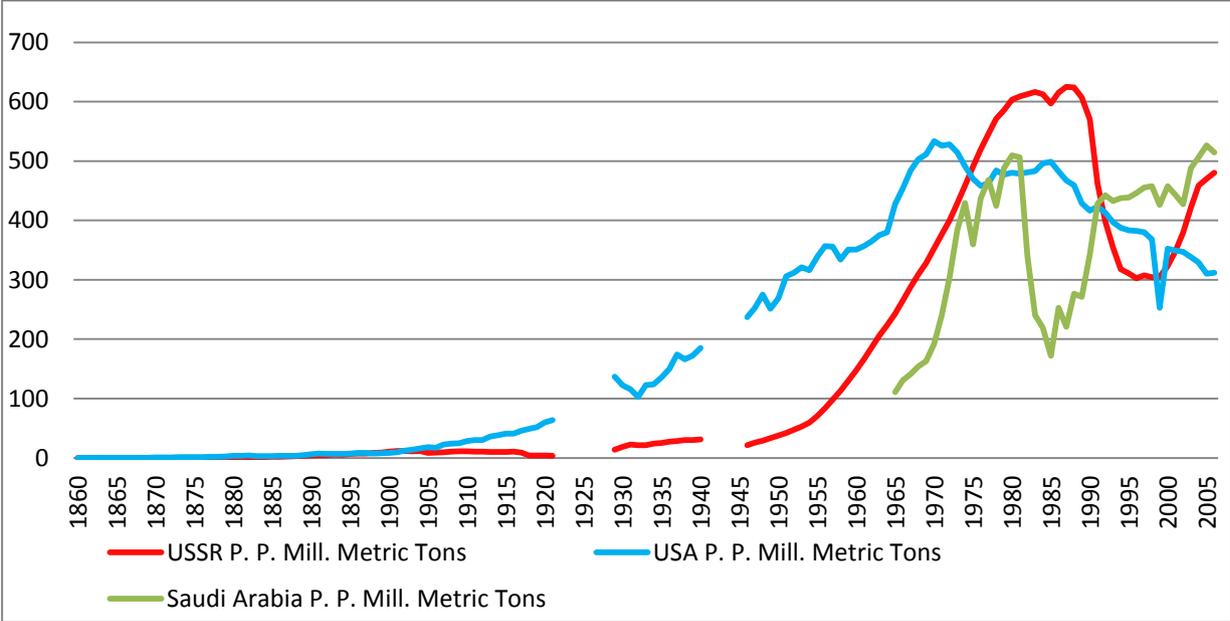
Notwithstanding all these impediments and delays, according to fig. 1 the USSR reached in 1976 an out-put of 10.466 barrels/day so as overcoming USA with a production 9.736 bbl/day and Saudi Arabia with 8.762 bbl/day, and becoming again the first largest oil producer worldwide. This supremacy held on till the collapse of the Soviet Union in 1991, where the output shrank by a 30 % from its peak of 12.601 bbl/day in 1987. This was even worse if we look at the level of output in 1996, the negative change in percentage was almost 50 % compare to the Soviet Era.

This peak of oil production was largely due to the new Tiumen region's fields in West Siberia, which benefited from the higher oil prices, and so higher investments, after the first oil shock in 1973 and the second one in 1979 caused by the Islamic-Khomeini revolution that led to 100% price-increase, passing from 14 \$/bbl in 1978 to 35 \$/bbl in 1979. This was a

⁸Marshall I. Goldman, *Petrostate: Putin, Power, and the New Russia*, Oxford, University Press, 2008, p. 40

brief story to understand in a better way on which basis Russia in 1992 tried to meet up again after the collapse of the Soviet Union.

Fig. 1 Crude Oil Production History: Main Historical Producers



Source: BP Statistical Review of World Energy

1.2 Transition: Privatization, Hyperinflation, and Crisis

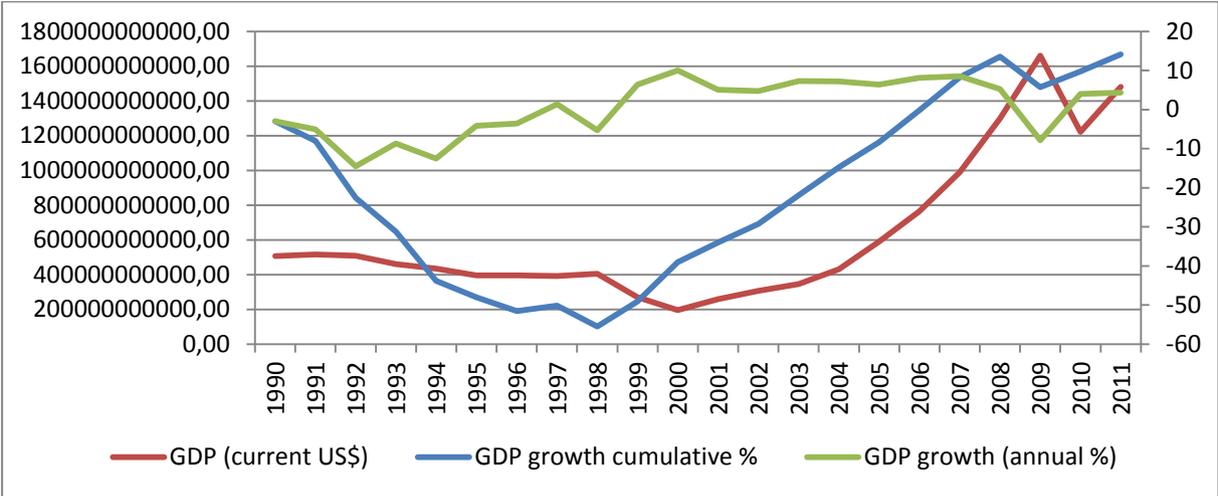
The USSR’s collapse in August 1991 provoked the chaos inside Russia and in all the other countries that had to face the transition from a communist system, central planned, to a free market economy. The Russian economy passed, according to the CIA analysis, to have 50% of the United States GDP in 1980 to almost 10 % in 1992⁹. The worst years for the Russian economies were just those after the collapse. According to fig. 2, we can see that the GDP growth showed till 1999 from 1990 eight years of recession, in which, looking at the GDP growth cumulative, it shrank more than 50%, regressing till the level of Portugal, the poorest country of the European Union at that time.

⁹Ivi, p. 56

The way of transition could be pursued by two main strategies, “Shock Therapy” or “Gradualism”, which both followed three main steps: liberalization, privatization and stabilization, according to a large debate that at that time divided the economists¹⁰.

The main critique to the shock therapy was that making the right reforms is important as well as making them at the right time and following a precise order. This was the main problem that faced the Russian Federation and many other CIS countries during the transition. As the story has taught us, looking back at Poland, Czech Republic and also China, even if it wasn’t a state inside the USSR block, the gradualism was the best choice to pursue, but unfortunately and also cause of the high pressure of Western World, Russia took the shortest path, which resulted the most winding.

Fig. 2 Slow down and Recovery after the USSR’s collapse of 1991



Source: World Bank Database 2012 (Left Axis Trillion US \$, Right Axis GDP growth in percentage)

The three big problems that Russia had to face were hyperinflation, an overvalued exchange rate and a wild privatization. These first two topics were quite linked, and from that I will start my analysis.

¹⁰To have an exhaustive overview on this debate see Marie Lavigne “ *The Economics of Transition: From Socialist Economy to Market Economy* ” McMillan Press LTD, London, 1995.

The Inflation in 1990 was almost around 15 %, but with the prices' liberalization it jumped to triple digit, resetting all the savings of Russians. The first government's goal during the transition was just to reduce the inflation to a reasonable target, and according to IMF the best way to ensure this was by keeping the nominal exchange rate fixed, even if it was over-evaluated. The IMF considered that a devaluation of the Ruble would have led to a still higher inflation so as bringing the economy to the default¹¹. To pursue this strategy Russia received lot of loans in foreign currency, mainly dollars, to sustain its exchange rate, buying rubles on the foreign exchange market. But this strategy provoked only a worsening of the situation, increasing the foreign debt, and making the manufacturing sector and its exports still less competitive.

Another factor that contributed, was the policy about interest rates. To fix the inflation, the Central Bank of Russia increased sharply the interest rates, reducing the money supply. This brought only a reduction of the investments in the economy, amplifying the recession. The contraction of the money supply even brought to a non-market economy, where the workers were paid in nature, and the barter started to be used for the goods of first necessity¹².

The icing on the cake in this chaos was the wild privatization of the public enterprises. Without any supervisor for a fair competition and with a galloping corruption, the public enterprises were sold out to a small clique by rigged auctions. This clique, also called "the oligarchs", was composed by people of ex KGB, the secret police at the time of the USSR, or by the so called "bankers". This fixed auctions took the name of loans for shares. The state to repay the interests on debt cause of its hard up position, needed to borrow money to private banks, and it was made by a special agreement that stated that if the government wouldn't succeed in repaying the loans, the banks could have the rights to purchase shares of public

¹¹Stiglitz Joseph E., *Globalization and its Discontents*, W. W. Norton & Company, 2002, *Italian translation, La Globalizzazione e i suoi Oppositori*, Giulio Einaudi Editore, Torino, 2002, p. 148

¹²Ivi, p. 158

companies as compensation¹³. This led to a selling-off, which allowed the oligarchs to take the control of these industrial giants for ridiculous amounts.

By this point, the oligarchs, cause of the low liquidity, and the high cost of money, didn't try to revitalize these giants, but they dismembered the companies, trying to get the highest profits. This then was translated into capital-outflows to offshore banks as in the case of Cypriot banks, and thanks to the overvalued exchange rate, this made the oligarchs billionaire¹⁴. The oligarchs weren't entrepreneurs, but rent seekers, that is, trying to find leaks in the government's policies, and take profit from them.

In this context the energy-giants, like the Ministry of Gas Industry and the Ministry of Fuel and Energy saw a different destiny. The former was transformed into Gazprom and only partially privatized, the latter was transformed into Rosneftegaz, but later was dismembered into other 4 main companies and then in much more entities. This led to a slow-down in the oil out-put, and so to a growing deficit of the current account and of the fiscal balance. The production shrank about a 40 % between 1991 and 1998. The final shock given to the oil industry was made by the crash of the price, which decreased sharply to 12 \$/bbl from 19 \$/bbl between 1997 and 1998. This made the oil business not always profitable and it was quite difficult even to cover the distribution's costs.

As this was the fatal shock for the oil output, so it was also the fatal blow for the Russian government, which declared the default and the unilateral suspension of payments in January 1999. According to J. Stiglitz "the Ruble depreciated in real terms more than 45 % compare to the level of July 1998"¹⁵. The Russian default produced a chain reaction to all the developing economies, which led to a sharper increase in the international interest rates on their loans than it happened during the Crisis of South-Eastern Asia in 1998. Also Latin America was hit by the Russian default, which brought Argentina, Ecuador and Colombia into

¹³ Marshall, *Petrostate: Putin, Power, and the New Russia*, p. 64

¹⁴ Ivi, p. 152

¹⁵ Stiglitz Joseph E., *Globalization and its Discontents*, W. W. Norton & Company, 2002, *Italian translation, La Globalizzazione e i suoi Oppositori*, Giulio Einaudi Editore, Torino, 2002, p. 151

a new crisis, and worsened the Brazilian recession¹⁶. As we could see, the proportions of the Russian crisis were global, and to see a glimmer of recovery the next government should have been able to use again its lost production capacity.

1.3 The Petroleum Export Recovery

The situation at the end of the 1990s was terrible, according to a World Bank Research more than 40 % of the citizens owned less than 4 \$ per day, and the poverty passed from 2 % in 1989 to 23,8 % in 1998, according to parameter of 2 \$ per day¹⁷. Only two factors, happening simultaneously, succeeded in giving the right stimulus for the recovery, they were the skyrocketing price and the export bonanza. In 2000, the prices hit 33 \$ per barrel, double than it was 1998. This was due to the rising impact of China and India on the global economy, and their growing demand for energy. China alone from 2001 to 2005 was the responsible of 30-40 % of the increase in oil consumption, and the emerging markets together accounted for almost the 80 % of the total increase¹⁸. This, as we will see better later, is a recurring reason for the continuous rising of commodity prices.

This new bull trend permitted the oligarchs to realize that it would have been much more profitable to invest into exploration and production instead of making asset-stripping and finding investments abroad. This was also facilitated by the lower exchange rate so as making Russian products cheaper to export, and by a flatter profit tax of only 13 % compare to the previous one of 30%, which wasn't paid by almost all Russians. This obviously led also to an increase in rent seekers, and their weight on the economy: according to the World Bank database, in 2000 the oil and natural gas rents as percentage of the GDP were respectively 20 % and 24 % compare to 13,5 % and 11 % in 1999. Furthermore if we compare this with statistics in 1995, the increase results much higher, almost triple for both resources, and for the windfall of their owners.

¹⁶Ibidem.

¹⁷Ivi, p. 154

¹⁸Marshall, *Petrostate: Putin, Power, and the New Russia*, p.79

All these events positively correlated with the economic recovery and the revived importance of petroleum as key factor for success were put all together by a man who was able with an impressive iron hand and a clear view to manage the situation, and to put Russian federation on the right path to regain the previous glory. This time not as a military giant as during the Cold War, but as an energy superpower. The new state of head after Boris Yeltsin in August 1999 was Vladimir Putin, previously head of the FSB, the modern KGB. The goal and the strategies to reach it were clear even before its nomination, and when he came to power, he started to implement them. In a dissertation made at the Mining Institute of St. Petersburg¹⁹, he summarized its view in three main points²⁰:

1. The Russian government has to reassert its control over the country's abundant natural resources and raw materials.
2. The Russian government has to succeed in building up industrial champions to be competitive in the domestic and global markets.
3. The Russian government should act in the interest of the nation, and the individual property owners (the oligarchs) should reach compromises and reflect the national policies.

As Marshall writes "in Putin's Thesis, he acknowledged that Russia would have a hard time becoming a competitive manufacture"²¹. In addition to these three points, another two must be mentioned and these will let us understand why the manufacturing sector will show years of slow-down.

4. Foreign Capital investments are welcome, but the operating control has to remain to the Russian nomenclature.

¹⁹ The dissertation was made in 1997, before he came to power, and after was emphasized by another article that was translated in January 2006 by Harley Balzer in Problems of Post-Communism.

²⁰ The analysis of these three targets is based on the explanation of the article made by Marshall I. Goldman in the book Petrostate.

²¹ Marshall, *Petrostate: Putin, Power, and the New Russia*, p. 98

This first point is important because it limited the possibility of Western companies, owners of more advanced technologies, to enter the Russian market, and often this was still stronger in the natural resources sector. This will produce a lot of conflicts and problems inside the country between the government and the local oil companies about merger and acquisition, joint-ventures and majority-share with Western ones. This obviously is going to obstruct the potential growth, the refining capacity and energy efficiency of Russian companies.

5. The market alone can't work and it was a mistake to rely on the private owners; they try to achieve only self-interest, going against the interests of state and society. Private monopolists obstruct innovation.

This last point in addition to the first three, makes us understand that Putin believes in the market, only if led by a hand that is not anymore invisible like Adam Smith has taught us, but well visible, and it is called state. This will drive Russian Federation thanks to its new leader to a new form of market economy, no more pure Communist or Capitalist, but a blend of both, the State Capitalism. It will be in these recent years, and in the next future, the new form of governance used by a great part of emerging markets, which see only the advantages of a faster catch-up to the West, but not the traps and the dangers that this path hides²². In the specific case of Russia, as it is going to be investigated in details in the next chapters and as it has been overviewed by the historical perspective, it is going to meet or it has already experienced higher dependency on natural resources, a possible threat of Dutch Disease, and a rising corruption and inequalities.

According to all this, Putin in 2000 started its campaign of re-nationalization with any means in his power, often not following "a civilized way". The old Ministry of Natural Gas, Gazprom passed in 2005 under a total state-control, by acquiring 51 % of the shares, but it resulted easy as it was only single entity. A harder challenge was to re-take the control on the Oil

²²The Economist, The Rise of State Capitalism, 21 January 2012, p. 11

industry, which had been dismembered in a lot of entities, and the oligarchs weren't prone to let them go back to its previous owner. But conversely in December 2004 Yugansneftgaz passed under Rosneft, state owned enterprise. Also Yukos followed the same destiny, dismembered and englobed, after a judicial war that brought the CEO, Mikhail Khodorkovsky and many other general managers in jail.

Sibneft, another oil company, owned by the famous oil baron Abramovich, was sold (72 % of the share) to the SOE Gazprom in 2005, even if there were many other Western companies as Chevron-Texaco, Shell and Total that would have paid much more than 13 \$ billion²³. So Gazprom was renamed in Gazpromneft and it started to control also a big part of the oil production, in addition to the gas monopoly. Putin didn't limit its acquisition to the oil and gas sector, and it took the control over industries as aircraft, aviation, heavy machinery, telecommunication, electricity, diamonds and exports, obviously acquiring majority stake according to the capitalism system.

Putin's strategy took place, and the Petro-state Capitalism started to work always on a wider global scale.

²³Marshall, *Petrostate: Putin, Power, and the New Russia*, p. 123

Chapter 2

Rising Dependency on exports and imports

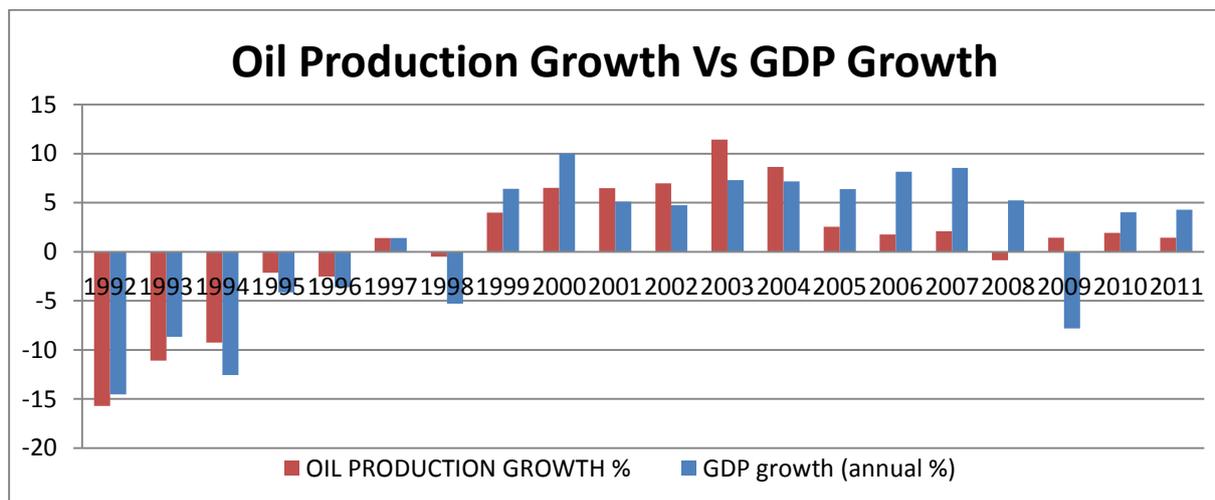
Introduction

In this chapter I'm going to analyze the issue concerning the rising dependency of Russia on both sides exports and imports. This research is divided into two main sections. In the former I will investigate the natural resources' exports and the imports of vehicles, instruments and machinery of Russia and this research will be refuted. In the latter this confutation will be strengthened by the descriptive analysis of Russian trade with EU-27, which, as it is demonstrated, reflects perfectly the image previously given of the Russian economic model, exporting for importing.

2.1 Natural Resources and V.I.M.²⁴

As we could see in chapter 2, Russia has always been reliant on natural resources, and when it has succeeded in exploiting them, it has faced long period of prosperity. After the USSR's collapse Russia has faced a great period of depression, and has started to recover only thanks to its most important resource.

Fig. 3 Oil Production Growth and GDP Growth



Source: World Bank database

²⁴ Vehicles, Instruments, and Machineries.

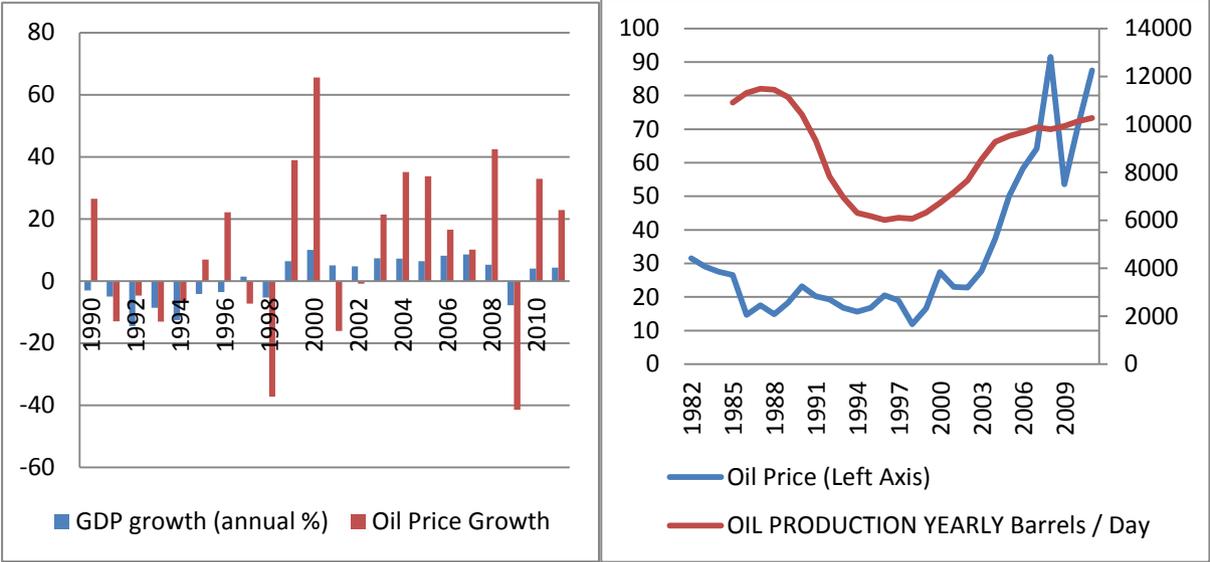
According to fig. 3, we can see that there is a high correlation between the Russian GDP growth and the oil Production. The growth production or de-growth has always affected positively and negatively the Russian economy. When it touched the lowest record of -15,7 % during 1992, the GDP shrank by almost the same amount. In three years the oil production was reduced about -36 % and the GDP followed it by -35 %. Conversely after the devaluation of 1998 and the Russian default the economy started to recover. From 1999 to 2008, before the recent oil shock and the sub-prime crisis, the economy grew at a rate of 7 %, reaching its peak in 2000 showing a double digit growth of 10%. But the correlation between the production and the GDP growth is not unique. As we know from history, the production has always been boosted by rising oil prices, which makes the investments in the sector more profitable, leading to new oil-wells discovery, and improvements in the refining capacity. According to fig. 4A we can see how the crude oil price affects also the Russian economic growth. Between 2003 and 2008 the price increased on average of 26 % every year, showing the peak in 2008 with a growth of 43 %, bringing the price to 91,48 \$/bbl as average of that year. Contemporaneously the economy showed its best performance in the last 20 years. During the crisis of 2009 the price collapse and this provoked a still harder recession for the Russian economy, which had a growth rate of -7.8 %, much lower than the average of developed economies -3,4 %, and also than the average of emerging markets that escaped recession, and only reduced their rate to + 2 %. If we look at the comparison with 2008, Russia had a change in absolute value of 14 percentage points. Between Brazil, Russia, India and China, the BRIC countries, only Russia fell into recession, all the other faced only a reduction of the growth rate. Brazil, the only one that makes its natural resources one of its weapon as Russia, passed to -0,6 from 5,2, but loosing less than one-third of what Russia lost. China passed from 9,6 to 9,2 and India even grew faster, passing from 4,9 to 9,1²⁵.

This data can let us understand that a country that relies on exports of only a commodity as Russia does, is highly prone to external shocks, and that those provoked effects still more devastating for these economies. Brazil that is less dependent on its oil exports than Russia

²⁵ World Bank database 2012.

suffered fewer damages, and India and China, which are not, were subjected to only a small decline or even the case of India to a higher growth rate.

Fig. 4A Oil Price Growth and GDP Growth **Fig. 4B Oil Price and Oil Production**



Source: World Bank database

According to fig. 4B we can observe that the graph verifies the positive relation between oil price and the oil output. When the price started to decrease in 1982, halving in 1986, the production simultaneously started to collapse and its recovery have been seen only in 1999 when the price started to increase again. These three graphs prove clearly how the Russian GDP is strongly dependent to its production, and as so, in turn, reliant on the price, which is exogenous and quite often volatile. The oil price and the production don't affect only the GDP, but as it will be investigated in chapter 3, these two variables influence a majority of all the Russian macro-economic indicators.

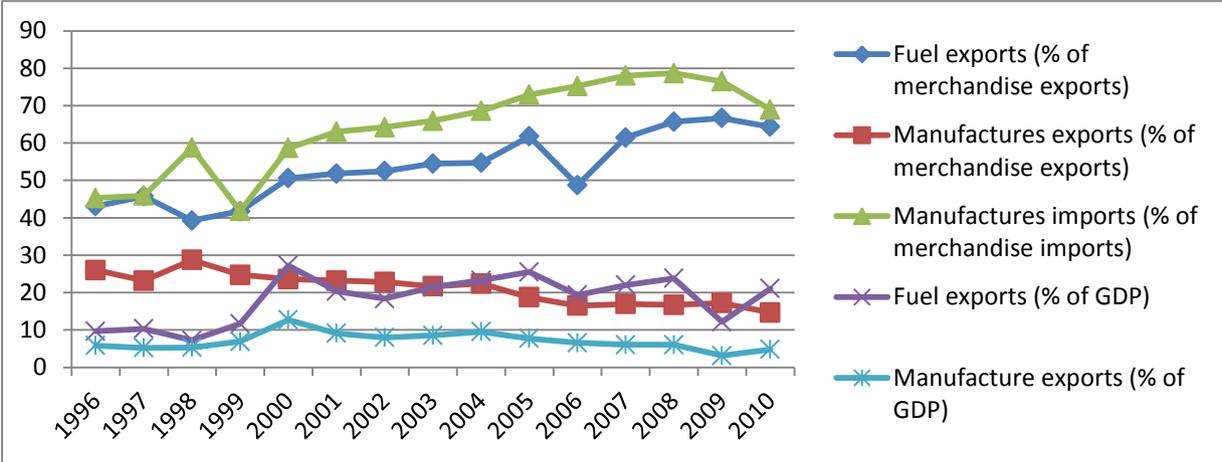
This correlation between oil price and government budget surplus is still more evident. In 2009 the central government debt was + 8,7 % of GDP. According to a research made by Spilimbergo the government budget's revenue increase by 0,40 % of GDP by an increase of 1 \$ in the price of a barrel of Ural(Over an average price of 24 \$/bbl)²⁶. This affects heavily the growth's sustainability in the long run, making the economy and the fiscal balance totally

²⁶A. Spilimbergo, Measuring the performance of the fiscal policy in Russia, 2005, IMF WP/05/241

prone to external shocks. In addition according to Gurvits, this fragility is still bigger because he found that under the current tax system the fluctuations in the government’s revenues related to the oil-exports swing between – 4 % and + 9 % of the GDP increasing the risk of sudden slow down or even worst recessions²⁷.

Another perspective that has to be taken into account is the weight that the natural resources exports have on the GDP and on the trade balance.

Fig. 5 Fuel & Manufacture’s exports as % of Merchandise Trade and GDP



Source: World bank database

According to fig. 5 we can see that the fuel exports passed from accounting almost 43 % in 1996 to 64 % in 2010, an increase of 21 % of its weight on the merchandise trade. To confirm this also the IMF affirmed in 2005 that “Crude oil, oil products, gas, and coal together accounted for almost 60 % of Russian’s total export revenues, respectively 32 %, 11%, 12 %, and 2 %”²⁸. To evaluate its weight on the GDP, I’m basing my research and my calculations on the World Bank data. The World Bank made also another study in 2004 that stated that Rosstat data were substantially underestimated. According to this, the weight of

²⁷E. Gurvits, Fiscal and monetary policy in the conditions of unstable international cyclical situation, 2006
²⁸ International Monetary Fund, 2005, “Russian Federation: statistical appendix”, IMF Country Report No. 05/378 (Washington: International Monetary Fund).

natural resources exports were in 2005 almost 20-25 % of Russian Gross Domestic Product²⁹. As the figure shows, the impact of natural resources exports on GDP passed from 9,6 % in 1996 to 21 % in 2010. Notably important is to see how this value fell in 2009 when the oil price collapse. We can say that keeping fixed the oil production and its quantity exported, a decrease in the price of 41 %, led to a 11,5 % lower impact of the oil exports revenues on the GDP in 2009, almost 12 % compare to 24 % in 2008.

This figure gives also a complementary perspective on the manufacturing exports weight on GDP and on the merchandise trade. We can say that it passed from having 26 % of the weight on the merchandise trade in 1996 to have 14,5 % in 2010. Also looking at GDP weight, it lost ground, passing from 6 % in 1996 to 4,8 % in 2010, reaching the bottom in 2008 with a weight of 3, 14 %.

We can also see a side effect, loosing importance the domestic manufacturing sector, the foreign one has gained shares, in fact the imports of manufacturing products passed by having 45 % of the total merchandise imports to 69 % in 2010, reaching a peak of 79 % in 2008. This, as the presuppositions could leave us realize, reflects the remarkable impact of Putin's strategies. The strategies were well implemented and the targets were achieved.

Another effect that can be discerned by the figure, but that here I'm going only to touch briefly, is the impact of the exchange rate on the imports and exports. In 1999 when Russia devaluated the Ruble of almost 45 % in real terms, as Marshall writes "the drop in imports may have hurt the Russian consumers and businesses that depended on imports, but it was a windfall for Russian manufactures who suddenly had the domestic market to themselves"³⁰. According to this, the industrial production rose by 6 % between 1998 and 1999, and by 10 % between 1999 and 2000; the weight of manufacture imports decreased by almost 20 % between 1998 and 1999, but it recovered in 2000 to the previous level, stating that Russian manufacturing sector weren't able to satisfy the growing demand. In

²⁹ This stake according to a Ahrend's research in 2006, should be corrected for transfer pricing and increased; he found also that the role of the oil sector, and particularly privately owned oil companies, has been vastly more important in driving economic growth than thus far recognized.

³⁰ Marshall, *Petrostate: Putin, Power and the New Russia*, p. 171

fact the manufacturing exports weight on GDP passed from 5,31 % in 1998 to 12,71 % in 2000. The graph underlines that the devaluation had also a strong impact on the fuel exports weight on GDP, which rose from 7,3 % in 1998 to 27, 3 % in 2000.

The rising recent appreciation of the Ruble will produce the opposite effect on the manufacturing sector, and it will be better investigate in the next chapter “The Dutch Disease” at the paragraph “Ruble as a Commodity Currency, Real Appreciation”.

We have been able to understand by chapter 2, that the Russian manufacturing sector has always faced problems in satisfying the domestic demand for technologies as vehicles, instruments, and machineries, essential for the industrial production. These three categories are also important because they are necessary for related industries to produce more advanced technologies. During the first period of the USSR’s era, just after the Second World War, Russia was on the cutting edge for military technology, aerospace, and heavy industry. The summit was touched the 4 October 1957 with the launch of the Sputnik 1, the first artificial satellite in the orbit of Earth. But the progressive exacerbation of the Cold War led to a growing closure of the Soviet Block, and to a backwardness in the innovation’s field. This backwardness can be explained by five main reasons:

1. The lack in the Soviet system of economic incentives for creative thinking and innovation.
2. The preference for quantity instead of quality in a central planned economy.
3. The impossibility to get the Western technologies cause of the closure of the Soviet market and cause of the unwillingness of the USA to share its most advanced technologies to the enemy.
4. The Industrial production was mainly in the heavy sectors, as steel and coal, which weren’t prone to innovation and core changes.
5. The industries often were state owned enterprise (SOE, or as Putin called them, the national champions), which, according to many researches, are much more

inefficient in the allocation of resources as capital than the private ones, and even they grow more slowly³¹.

6. Linked to point 5, the small-medium enterprises are more inclined to produce radical changes and innovation, and the Soviet System had a preference for the big giants, because it was the only way to manage a central planned economy.

Many of these reasons are still valid to explain why Russia is still lagging behind many other advanced economies and also behind many other emerging ones, even if it is rich of natural resources as few countries in the World. Those errors, Russia have brought with itself till nowadays, and a lot of them have worsened. I want to underline as point 5 and point 6, under Putin's strategy has got worse off, and according to what he said in its speech's election "Russia has to command these companies and once again integrate them vertically into industrial conglomerates, so as they could compete better with Western multinational corporations"³², the situation is evolving in the direction diametrically opposed to pursue efficiency, innovation, and manufacturing growth. In addition to become less competitive, Putin's State Capitalism brings to favor well-connected insiders instead of innovative outsiders, so as boosting corruption and inequalities.

In fact looking at the Corruption Perception Index Russia was ranked as 71 in 2002, but its position worsened, passing in 2011 to 143 on 177, classified at the same level of Azerbaijan, Belarus, Comoros, Mauritania, Nigeria, Timor-Leste, Togo, and Uganda³³.

Also the population's inequalities worsened, the Gini coefficient passed from 35,7 in 2002 to 42 in 2010, and the dangerous level up to 40. These are still heavier if we look at the regional disparities. Basing on Gross Regional Product per Capita, according to a Deutsche Bank research, the average GRP per capita in 2007 was 6.300 \$, but with a strong standard deviation. In fact Moscow Region, the second largest for GRP per capita showed a value of 26,225 \$ against Rostov Region with only 4,300 \$, which both are classified within the top 9

³¹The Economist, The Rise of State Capitalism, 21 January 2012, p. 11

³² Marshall, *Petrostate: Putin, Power, and the New Russia*, p.97

³³ Transparency International Statistics 2012

economic Regions³⁴. Another indicator that shows this trend is the growing income shares held by the richest 10 %, 20 % and by the poorest 10 % and 20 %. Respectively the share of the richest 10 % and 20 % passed from 27 % and 42 % in 2002 to 33,5 % and 49 % in 2008. Conversely the lowest 10 % and 20 % passed respectively from 2,84 % in 2002 to 2,56 % in 2008 and from 6,88 % in 2002 to 6,04 % in 2008. So this shows how the richest income threshold is growing faster and faster every year, and how the poorest threshold 10 %, but also the 20 % is not growing but decreasing their shares. This is impressive because according to a study of the Congress of the United States, usually also the lowest threshold grows even if at a lower rate than the highest ones. But this in Russia doesn't happen, on the contrary there is a de-growth of the lowest threshold.

We can say, thanks to this overview, that the disadvantages are already present and evident, and only in the following chapters we will analyze if these have already outweighed the advantages.

2.2 Russia's trade analysis with World and EU-27

In this paragraph I'm going to investigate the Russian trade with World and mainly with EU-27 because it reflects perfectly the general trends, and brings out some cronyisms of the Russian economy. Mainly I will underline the cronyism of the Russian model, which is based on the total dependency of natural resources' exports to secure the access to products that without imports, Russia could never enjoy.

I will try to individuate the main intra EU-27 partners and the main product categories of Russia using the data collected by the Eurostat database following the harmonized system of classification. This Research will mainly adopt statistics about 2009 and 2010.

According to table 1 we can notice that the trade partner EU-27 owns the first position both for imports and exports with Russia Federation. The European Union gets almost 47 % of the total Russia's Trade in 2010. Russia has a surplus of trade balance with World, almost € 128

³⁴ Deutsche Bank research, The Russian Regions, 18 September 2009, p. 9

billion, and also with EU-27, almost € 48 billion in 2010. By this we can say that EU accounted for more than 37 % of the Russian trade Surplus. However as we will see further, this share is going to be reduce in years.

After it, there are lots of countries with medium-small shares, but nobody owns the same weight as EU-27 has. We can notice that China has great shares, owning the second place in the rank with almost 9 % of the total, followed by United States with 5 %. Also Ukraine is an important partner for Russia, even if it is not a big country to compare with Europe, China and USA³⁵.

For example if we look at China, it is more oriented on the export side with Russia, instead of the import one. In fact it owns with Russia a positive trade balance, showing a second position in the Russian imports world ranking, but a third place for exports. As usually USA shows a trend of import oriented country, in fact it shows a negative trade balance with Russia, owning the second place for imports, but only a sixth place for exports. The fourth place of Ukraine is justified more by the import side than the export one, even if it shows a higher ranking for exports than imports.

Table-1: Russian Major import and export partners in 2010

Rk	Partners	Mio euro	%	Rk	Partners	Mio euro	%
World (all countrie				World (all countrie			
		175.090,5	100,0%			303.577,1	100,0%
1	EU27	87.979,7	50,2%	1	EU27	136.056,6	44,8%
2	China	24.664,9	14,1%	2	United States	18.314,1	6,0%
3	Ukraine	9.263,2	5,3%	3	China	17.720,6	5,8%
4	Japan	6.722,4	3,8%	4	Turkey	14.809,0	4,9%
5	Belarus	5.899,1	3,4%	5	Ukraine	11.322,0	3,7%
6	United States	4.965,3	2,8%	6	Japan	11.135,5	3,7%
7	Turkey	3.850,6	2,2%	7	Belarus	8.622,7	2,8%
8	Brazil	3.458,4	2,0%	8	Kazakhstan	8.304,4	2,7%
9	South Korea	3.447,3	2,0%	9	South Korea	4.433,7	1,5%
10	Kazakhstan	3.334,5	1,9%	10	India	3.463,9	1,1%
11	Switzerland	2.149,4	1,2%	11	Iran	2.602,4	0,9%
12	Hong Kong	1.241,1	0,7%	12	Singapore	2.314,6	0,8%
13	India	1.174,9	0,7%	13	Thailand	2.246,5	0,7%
14	Canada	963,6	0,6%	14	Brazil	1.445,1	0,5%
15	Norway	954,7	0,5%	15	Norwav	1.358.2	0.4%

Source: Eurostat database 2012

³⁵These numbers are the mean of the shares from the import and the export side, that is the shares of the total trade.

2.2.1 The spreadsheet of trade distribution across EU gateways (Imports)

This part aims to investigate Russian's main trade gateways in Europe by the import side comparing 2010 with 2009.

In 2009 , total imports from Russia to EU sum up to € 105,7 billion³⁶ and in 2010 they increased passing to € 145,5 billion, most of which is going to Germany, Nederland, Italy, France and Poland, which could be considered the main import partners, which accounted for almost € 58 billion, more than 55,4 % of the total in 2009.

In 2010, overall imports to the main five partners increased reaching € 80 billion, but decreasing a little bit in shares showing 54,9%. All the main partners increased their imports, but not all with the same rate. For example Poland showed a strong increase, overcoming Italy, and becoming the third main partner, with a growth rate of 44% in comparison with the Italian one of 12 %. However also Germany and Nederland showed a high imports growth rate, respectively 42 % and 52 %.

Table-2: Total EU imports from Russia 2009 and 2010

EU 2009	Germany	Nederland	Italy	Poland	France	TOT
105.707.123	15.583.079	12.689.588	12.134.156	9.085.004	9.047.365	58.539.192
100%	14,74 %	12,00 %	8,59 %	11,48 %	8,56 %	55,37 %
EU 2010	Germany	Nederland	Poland	Italy	France	TOT
145.561.360	22.135.466	19.397.768	13.624.968	13.044.227	11.696.063	79.898.492
100%	15,21 %	13,33 %	9,36 %	8,96 %	8,04 %	54,9 %

Observing the main product-import categories we can see that in 2009 section 5 mineral products, which comprehends crude oil, natural gas, coal, and electricity, accounted for most of the European imports almost € 88 billion, 83 % of the total imports and 89 % of the main four product-import categories. It is followed by section 15 base metals that counted almost € 6 billion, 5,5 % of the total imports, section 6 chemicals almost € 3 billion, 3 % of

³⁶ All the values inserted in the table have to be multiply by 1000.

the total imports, and section 14 jewellery , pearls & precious stones almost € 1,5 billion, and 1,4 % of the total imports.

Table-3: Total EU imports from Russia per product (2009)

Products	Value in 1000 €	Value in %	% on TOTAL Imports
Section 5	88.090.246	89,16 %	83,8 %
Section 15	5.930.280	5,97 %	5,58 %
Section 6	3.232.029	3,24 %	3,04 %
Section 14	1.534.813	1,5 %	1,42 %
TOT	98.787.368	100 %	93,37 %

In 2010, imports for the main sections increased, and each one keep stable its position. This growth as we will see later is due to an increase in the price of the commodities as gas and oil and not to an increase in the quantity imported. This can happen because the demand for commodities as oil and gas is quite inelastic. The change in Russian revenues between 2010 and 2009 is around € 31 billion for section 5, € 3,8 billion for section 15, € 1,3 billion for section 6, and € 1,7 for section 14, for a total of € 37,8 billion.

As we can see the total value of the main four product-import categories increased their shares, passing from 93,4 % to 94,29 %, meaning that the Russian comparative advantages in those sectors are tightening, so it is not happening a process of export-diversification. Even though section 5, oil-gas-coal grew about 35 % between 2009 and 2010, its weight on the main four sections decreased, passing from 89 % to 87 %, losing 2 % of shares.

Table-4: Total EU imports from Russia per product (2010)

Product	Value in 1000 €	Value in %	% on TOTAL Imports
Section 5	119.565.538	87,09 %	82,13 %
Section 15	9.767.473	7,07 %	6,66 %
Section 6	4.587.051	3,35 %	3,16 %
Section 14	3.283.889	2,40 %	2,25 %
TOT	137.203.951	100 %	94,29 %

We notice that this strong increase for section 5 is due to the contributions of Nederland and Germany as first, but also to Poland and France.

About section 15, the strong growth is due to the contribution of Germany, Nederland and Italy respectively.

According to table 5 we can state that the weight on the total imports of the main import-partners reflects the weight of the shares for the specific product-category oil-gas-coal.

Table-5: Trade Distribution of imports from Russia (Product 27: Mineral Fuels)

	Germany	Nederland	Italy	France	Poland
2009	14.28 %	12.77 %	12.12 %	8.94 %	7.29 %
2010	14.74 %	14.53 %	8.88 %	8.87 %	8.41 %

Going deeper into the analysis, as shown on table 6, when we investigate the relevant product categories, we see that product 27 in section five is divided by other three main subcategories: Oil, Gas and Coal.

As we can see about oil only Poland has increased its shares from 2009 to 2010 by 1.38 % against Italy - 0.85 %, Germany - 0.36 % and France - 0.26 %.

About coal we see that Nederland has tripled up its shares and Italy with France have doubled up their shares. It is due to the sharply decrease in the UK consumptions, which passed from 35.65 % to 16.82 % of the total shares. In fact coal had a small increase in the total EU consumption.

About imports of gas, we can see that Italy, which was the main importer of gas from Russia decrease its shares passing from 40 % to 28 %, almost 12 % percentage points lower. This is due to the supply's diversification that it is implementing, above all increasing the imports from North Africa. This shares are gained, not by the main trade partners, but with the neighbor-countries as Czech Republic, Hungary and Slovakia.

Table-6: Trade Distribution of EU imports from Russia (Product Level Sub-Category)

		Germany	Nederland	Italy	France	Poland
2009	Coal	14.84 %	5.17 %	3.53 %	2.5 %	11.25 %
	Gas	0 %	0 %	40.05 %	0.04 %	2.56 %
	Oil	28.88 %	32.33 %	15.54 %	30.5 %	10.86 %
2010	Coal	15.03 %	16 %	6.26 %	5.27 %	14.36 %
	Gas	0.02 %	0.01 %	28.27 %	0.07 %	3.50 %
	Oil	28.52 %	32.58 %	14.69 %	30.31 %	12.24 %

As first conclusion we can say that all the main four product categories exported by Russia to EU-27 are natural resources or their close derivatives, and that the relative weight is still higher than the World Trade. As we have seen previously the weight of natural resource exports revenues were around 65 % with World and with EU-27 this value increases till 83 %. Even though these decreased of almost 1,5 % between 2009 and 2010, the weight of the main four product-categories, natural resources and chemicals, increased their weight on the total, reaching a critical level of 94 %.

Summarizing briefly the critical situation, section 5 accounts for 82 % of the EU total imports from Russia in 2010. As result, the other 20 categories own less than 20 %. And if we add also the value of base metals, the other 19 sections account for less than 12 %. Product 27 is a very dominant import sector accounting more than 90% of imports in 5 countries as France 90,60 %, Greece 90,49 %, Latvia, Romania, and Bulgaria; for more than 80 % in 8 countries as Nederland 89,47 %, Italy 80,61 %, Estonia, Sweden, Finland, Czech, Slovakia, and Hungary; and for more than 70 % in Germany 79,45 % and Poland 73,21 % in 2010.

The base metal sector has however a quite dominant position, above all in those countries that not own a so high shares in mineral products, it shows a level higher than 20%, as Denmark 32%, Latvia 21,19 %, Estonia 20,35%; and in our main partners however it is quite

important, owning a level higher than 10%, as Germany 10,71%, Belgium 15,07%, Italy 10,47%, Nederland the lowest with 8,43 %.

2.2.2 The spreadsheet of trade distribution across EU gateways (Exports)

Looking at the European exports to Russia, they reached €64 billion and €85 billion in 2009 and 2010 respectively. The y/y change counted for almost €14 billion or 15%. A trade balance among the EU-27 and Russia deepened by €20bn from €41bn up to €61bn from 2009 to 2010, which represents almost a 40% increase. Total trade grew by 36% from €170bn in 2009 to €232bn in 2010. About this we can say that there is a correlation between growing exports revenues and growing imports expenditures. The former, counting only for natural resources, increased by € 37,8 billion, and the latter, counting alone for Vehicles, Instrument, machineries, and Chemicals increased by € 13 billion on the total increase of € 14 billion. The growing purchasing power is related heavily to the import side and not to the domestic demand.

Continuing with the data analysis, the main groups of exports are 'agribusiness' and 'Vehicles, Instruments, Machinery' or VIM. Exports of agribusiness in 2010 from the EU to the Russia counted for more than €9bn, VIM exports in turn reached €51bn, almost 60 % of the exports shares.

Table-7: Total trade flows between the EU-27 and the Russian Federation in € 1000

EU - RF (in EUR 1000)	2010	2009	Absolute change $T_1 - T_0$	y/y change (in %)
Total EU-27 Imports	147,069,379	105,706,493	41,362,884	39.13
Total EU-27 exports	85,529,671	64,747,007	14,632.77	15.43
Trade balance	-61,539,707	-40,959,486	-20,580,220	-39.19
Total trade	232,599,050	170,453,501	62,145,549.05	36.46%

Table-8: Agribusiness & VIM in 2010

Mainsections	Value in €1.000
Agribusiness (Section 1-4)	9,198,726.22
VIM total	51,118,095.47
Vehicles (section 17)	11,517,030.17
Instruments(section18)	3,024,807.93
Machinery (section 16)	27,377,531.15

According to table 9, we notice that the main gates through which European goods flow to Russia in 2010 were Germany with its exports of € 26 billion following by Italy and France. The five biggest gates in total account for € 51 billion alone, which is almost 60% of all the EU exports to Russia.

Regarding our main gate, roughly 30% of all EU exports to Russia are made by Germany.

Table-9: Main gates for the EU goods exports to Russia

2010	Absolute	Relative	2009	Absolute	Relative
85,529,671.56			64,747,007.25		
Germany	26.269.556,20	30.71%	Germany	20,609,148.53	31.83%
Italy	7.887.877,66	9.22%	Italy	6,417,866.35	9.91%
France	6.289.609,05	7.35%	France	4,909,586.95	7.58%
Netherlands	5,753,741.09	6.73%	Netherlands	4,217,615.87	6.51%
Poland	5,042,126.31	5.90%	Poland	3,593,551.61	5.55%
Total	51,242,910.31	59.91%	Total	39,747,769.30	61.39%

Source: Eurostat database

According to the table 10 we can see that the most significant part of the EU exports to the Russia is held by Section 16 which represents machineries with a 32 % of the total in 2010.

Table-10: Main type of goods exported to Russia in 1,000€

2010:	Absolute	% of total	2009:	% of total	y/y change
85,529,671			64,747,007		in %
		imports to the			
		EU			
Section 16	27,383,133.84	32,02%	21,219,397.52	32,77%	29,24%
Section 6	13,075,685.19	15.29%	9,660,776.12	14.92%	35.35%
Product 30	6,395,220.07	7.48%	4,335,363.03	6.70%	47.51%
Section 17	11,517,030.17	13.47%	7,633,751.80	11.79%	50.87%
Product 87	9,915,067.58	11.59%	5,359,826.73	8.28%	84.99%
Product 39	3,501,662.07	4.09%	2,522,470.45	3.90%	38.82%

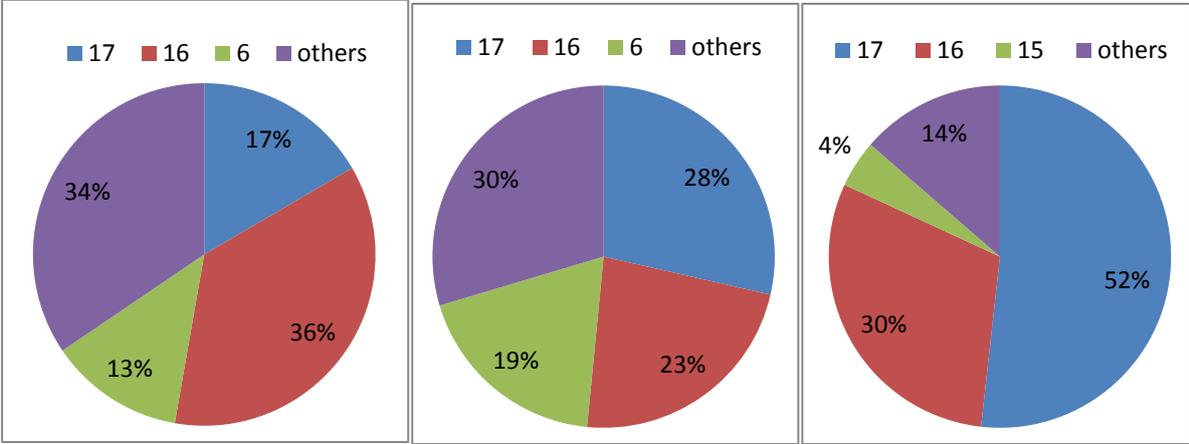
Total	52,583,885.0	60,76%	38,513,924.0	59,48 %	36.53%
	4		6		

Also section 6 chemical products have a quite important share almost 15 % in 2010. The section is divided further into subcategories-products. Product 30 represents pharmaceutical products and it owns a share of 7,5 % almost on the total, the 50 % of the category's value. Section 17 vehicles owns a shares of 13,5 %.And Product 87 is 'non-rail rolling stock' shows an 11,6 % of shares. Product 39 is 'plastics & articles' has an impact of 4 %. Finally, the last row shows us the total value of products above and its share on overall exports. The value of the main categories machineries, vehicles, and chemicals increased their shares and also their value between 2009 and 2010. The table above also shows us the change of export of each product in time. For example, exports of product 87, where cars are included, has grown by more than € 4 billion from 2009 to 2010 and increased its share on overall exports from roughly 8 per cent up to 11.5 per cent.

Taking a look at our country gates and its specialization on main products, key countries for product 87 non-rail rolling stock are Germany, the United Kingdom, and Slovakia. In 2010, almost 41 % of production of product 87 was exported from Germany, Slovakia and the UK each exported 10 per cent of all EU product 87 exports to Russia.

According to figure 6 we see that 66% of all Germany's exports to Russia consist of only three sections – machinery (section 16), vehicles (sec. 17), and chemicals (sec. 6). The largest share is represented by machinery, 36% share on all German exports to Russia.

Fig. 6: Germany, United Kingdom and Slovakia’s main exports categories as %



According to table 11, it depicts exports of two most significant export sections, machinery and vehicles. Machinery and vehicles exports counted for more than 36% and 13% respectively of the total EU basket exports to Russia in 2010.

Focusing on Germany, the Russian main trade partner, its exports of machinery and vehicles alone count for almost 53% of all Germany’s exports.

Regarding the C/2 column, it expresses the export specialization on product. For example, Romania, Hungary, Sweden are very specialized gates for machinery. Slovakia and the UK are very specialized export gates for vehicles. Taking Slovakia as an example of vehicles exporter, the country is much specialized in vehicles manufacturing. Almost 52% of all the exports to Russia are vehicles. Specialization is also seen in C/2 where Slovakia has a value of 38% and its imports are by 38 percentage point above EU vehicle exports. Slovakia exports are by 38 percentage points more focused on vehicle exports than the EU average.

Our main gate, Germany, has slight specialization in section 17, reaching + 3.12 percent points above the global EU basket. (EU basket is an overall export flow to Russia for EU-27 countries all together). It is important to mention, that Germany exports almost 41% of

product 87 as global shares of the EU basket to Russia, and 41 % of all EU-27 exports of product 87 in 2010 went from Germany alone.

Table-11: Specialisation and Concentration

Section 16 C/1 table		C/2 table	Section 17 C/1 table		C/2 table
Romania	53.99 %	21.98%	Slovakia	51.77%	38.30%
Hungary	51.53 %	19.52%	UK	28.57%	15.10%
Sweden	46.74 %	14.73%	Czech Republic	20.67%	7.20%
Czech Republic	44.01 %	12.00%	Sweden	19.40%	5.93%
Netherlands	42.53 %	10.52%	France	20.78%	7.31%
Deutschland	36.17 %	4.16%	Romania	19.01%	5.54%
France	19.30 %	-12.71%	Deutschland	16.59%	3.12%
Section share on the EU X	32.01 %	0.00%	Section share on the EU X	13.47%	0.00%

The value share of vehicles on overall exports to Russia is 13.47 %; The share of machinery on overall exports to Russia is 32.01 %

2.2.3 Conclusion

According to this analysis we can see that the five major partners of Russian imports are those also for exports, and they are Germany, Netherland, France, Italy and Poland. The European imports reflect perfectly the comparative advantages of Russia in natural resources as Oil, gas, coal and various metals and precious stones. The total value of Russian fuel exports to EU-27 accounted for more than 80 % between 2009 and 2010 and if we add also the metals as steel and ore, the value reaches 90 %.

This states how Russia is totally reliant on its natural resources exports and how conversely EU-27 is reliant on Russian exports. This is due to the fact that for the European Union is quite difficult to find other sources of supply of oil and natural gas, because they are mainly

transported by pipelines almost all owned by the SOE Gazprom which manages nearly a monopoly. At the same time once expensive pipelines are built and natural resources production exploited, Russia will be reliant on its customers as these are on the suppliers. This theory has been valid only when EU-27 has behaved as a single entity through its foreign trade policy. But now with the growing demand of the emerging markets, mainly by China and India, this threat doesn't affect anymore the Russian strategy for the security of demand. In fact Russia has always tried to impede European Union to diversify its supply, for example boycotting pipelines that should pass through other countries and not on its territory. This would have allowed the European Union to better react against the Russian monopolistic policies so as owing a stronger power in the bargaining the distribution prices for oil and gas.

This new security of the demand for Russia leads to the security of rising prices and so to a lower probability of external shock, which has always brought Russia to long recession. According to a Deutsche Bank research between 1990 and 2005 China has helped the World Commodity consumption growth of Aluminum, Copper, Oil, Soy oil and Sugar by respectively 15 %, 14 %, 7 %, 14 % and 6 % alone; whereas India affected them respectively by 5 %, 7 %, 5 %, 11 %, and 7 %³⁷. This growth of demand has brought the commodity prices still higher.

According to The Economist, China's share of World commodity consumption in 2010 was almost 50 % for Iron ore, 45 % for coal, 42 % for lead, 41 % for zinc, 40 % for aluminum, 40 % for copper, 39 % for Nickel, and 12 % for Oil³⁸. This shows how the market is still growing, and until China keeps growing at double digit, this bull trend doesn't seem to be possible to come to a halt. Even more the situation is forecasted to deteriorate cause of the Iran behavior and its impact on the supply of oil. Iran, reacting to the American Embargo and European demands-cuts due to the raising concern on nuclear weapon, is reducing its production and is threatening to close the Strait of Hormuz, through which pass 20 % of the

³⁷Deutsche Bank Research, Brazil, Russia, China, and India: how the waking giants are reshaping the world, March 2008

³⁸The Economist, Special Report on the World Economy, 24 September 2011, p. 24

global oil's needs³⁹. This creates anxiety in the market and it is pushing up the price of oil which saw in February 2012 a peak of 120 \$/bbl, which represents an average trend higher than that in 2008. This issue is worsening also because of a low spare capacity, which would be insufficient to offset a possible crisis.

This trend, as we have mentioned previously in the analysis, drives the Russian economy to a GDP growth rate around 4 % - 4,5 % and according to this expectation to a higher rate, so as continuing to push up the purchasing power of Russians.

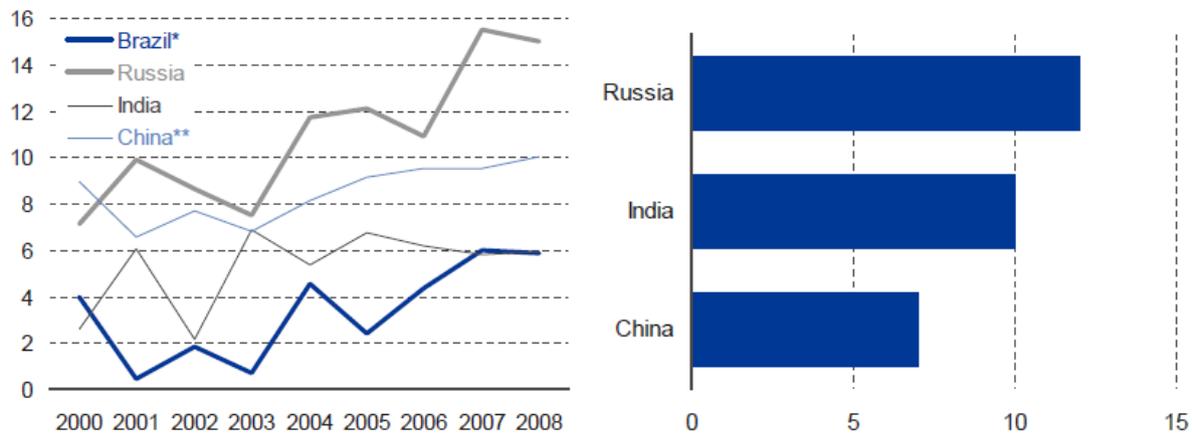
According to fig. 7A the private consumption of BRIC countries is rising, and the best performer is Russia with an increase in the private consumption of 15 % yearly in 2008, five percentage points higher than China, and almost more than double of India and Brazil. From 2000 till 2008 Russian private consumption grew yearly on average around 11 %. This has a strict relation, especially in the case of the Russian Federation, with the growing internal demand for foreign products.

In the graph 7B, we can see also how the deliveries growth of German Machineries is strongly correlated to the soaring private consumption of BRIC countries. According to this analysis Germany, as we have seen the main trading partner for the import and export side but especially for vehicles, machineries and chemical, has increased its deliveries of machineries to Russia about 12 % from 2007 and it is forecasted to last until 2015.

This confirmed unfortunately for Russia the growing reliance on imports for technologic products. These, to be manufactured domestically, need high investments in R&D and an economic environment prone to create competitive advantages through the learning by doing model and industrial cluster system which have always been the basis for the innovation process and a dynamic-diversified growth in the manufacturing sector.

³⁹The Economist, High Drama, 25 February 2012, p.65

Fig. 7A Private Consumption Growth Fig. 7B Deliveries' Growth of German Machineries in 2007-2015



Source: Deutsche Bank research (March 2008, p. 9) *Total Consumption. **Household consumption

This said, we can proceed to investigate if, beyond this strong dependency on the natural resources exports' revenues and on the imports of high quality manufacturing products from EU-27, there is a real threat for the Russian economy to contract the Dutch Disease.

Chapter 3

The Dutch Disease

Introduction

In this chapter we will discover if the main cause - the Dutch disease phenomenon - for the “ Natural Resource Curse ” is real or not, which is if oil dependence⁴⁰ is a blessing or a curse in the Russian Economy.

⁴⁰According to different papers, the terms abundance and dependence are used as synonymous; but in others it is paid attention to the big differences that exist between the two meanings, and to the different types of result that comes from, if it is used one or the others (Cause of we are analyzing the issue by not an econometric model, which needs a clear specification of the variables, but by a general overview of the

The Natural Resource Curse was for the first time used by Richard Auty in 1993, which referred to the theory that economies rich in resources show fewer economic growth and development than those poorer of natural resources.

To explain why the dependency on natural resources exports is such a negative phenomenon, we will investigate two main fields of research, macroeconomic policy and political science.

According to Ross, the latter research field - political science - is subdivided into three other possible reasons: cognitive expectation, societal explanations and weakening of state institutions⁴¹. The basic idea that links together these three ways is the mismanagement of the natural resources and their revenues by the government and its politicians.

In this paper, however, I will pay more attention on the former research field, the macroeconomic aspect, even if, in Russia, the political aspects play a very important role, as we have seen in the historical overview. To analyze better what the main reasons of this macroeconomic aspect are, I will divide them according to a working paper of the International Monetary Fund, which affirmed that the Natural Resource Curse is caused by three main phenomenon.

According to Oomes and Kalcheva⁴², the most important explanation is the so called “Dutch Disease”, but it is not the one.

The term Dutch Disease for the first time was coined in 1977 by The Economist, and it referred “to the adverse effects on Dutch manufacturing of the natural gas discoveries of the

previous economic theory, I will use them as synonymous, so as focalizing on oil importance in the Russian Economy as a whole).

⁴¹BorkòTamàs, The Suspicious of Dutch Disease in Russia and the ability of the government to counteract, Working Paper No. 35, ICEG European Center, December 2007, p. 4 ; see also Ross, Michael L. (1999): The Political Economy of Resource Curse, World Politics, January, pp. 297-322
<http://www.polisci.ucla.edu/faculty/ross/paper.pdf>

⁴²N. Oomes and K. Kalcheva, Diagnosing Dutch Disease: Does Russia have the symptoms?, IMF WP/07/102, April 2007, p. 4

nineteen sixties, essentially through the subsequent appreciation of the Dutch real exchange rate”⁴³.

In addition two other possible factors can bring economies to face the Natural Resource Curse:

1. Large windfalls of revenues from natural resources tend to give rise to rent-seeking behavior and fights over the distribution of these revenues, which in turn impede growth, as productive resources are drawn into non-productive activities.
2. Resource rents tend to be volatile, which leads to uncertainty that is a deterrent for future investments and for a sustainable growth.

According to these reasons, lots of studies have been done to analyze if there is evidence of this issue in the economies of natural resources producing countries. Always in the past there has been discordance between different researches, in fact studies led to state a positive impact of natural resources abundance on the Welfare of a nation, and others to a negative impact.

One of the most important empirical researches that investigated the resource curse theory, and its impact, was written by Sachs and Warner in 1995⁴⁴. They discovered that resource-rich countries grow slower than resource-poor countries, on average⁴⁵. More precisely they calculated that resource-abundant countries experienced a de-growth of 0,39 % per year, almost 7 % of the GDP per capita in 20 years.

⁴³ The Economist, The Dutch Disease, November 26th 1977, pp. 82-83. However later Ellman in 1981 found that the real problem in that specific case was not the real appreciation, but the rising government’s expenditures on public services which were not sustainable.

⁴⁴Sachs J. D., Warner A. M., Natural Resource Abundance and Economic Growth, NBER Working Paper 5398, 1995

⁴⁵This research, based on 97 developing countries as for example Nigeria and Venezuela, strong oil-producing economies, and heavily reliant on these exports, discovered that real GDP growth per capita for these economies was negatively correlated to the ratio of resource exports on GDP during 1970-1989.

But conversely to this analysis, recently two Swiss economists, Christina Brunnenschweiler and Erwin Bulte investigated the same research problem and they discovered a totally opposite scenario⁴⁶.

They found in their empiric research analyzing almost 80 countries between 1970 and 2000 that:

1. Resource abundance, constitutions, and institutions determine resource dependence.
2. Resource dependence doesn't affect growth.
3. Resource abundance positively affects growth and institutional quality.

It is reasonable to think that the possible case of the Russian economy fits with the second explanation of the two Swiss researchers because Russia has started to recover from the recession thanks to the oil production recovery and to the increase in the oil-price in 2000. But also, as it has been explained in the historical overview, the first result of this study seems to describe perfectly what happened in Russia when Putin came to power. In fact Putin was who determined the natural resources dependence, or that who reunified the energy industry under the state control to boost the economic growth. So we could say that in this specific case, the institutions determined the dependence on the resource.

This is a crucial point, because, according to empirical researches⁴⁷, if a country owns bad institutions, these will bring the natural resource abundance to be a curse, and on the other

⁴⁶Mainly they focused on three different concepts that are necessary to explain to understand why some resource-rich economies grow and others de-grow. According to this paper an important distinction has to be done. Usually there is an overlapping of meanings between resource abundance, resource rents, and resource dependence, but they are not equivalent. In fact as Brunnenschweiler and Bulte write "exists a discrepancy between the theory behind the curse, and the empirical work used to support it. While abundant resource rents are a crucial element in the theory, most previous analyses rely on a measure of resource dependence, and our analysis suggests that resource dependence may not be a proper exogenous variable. Treating resource dependence as endogenous, we find it to be insignificant in growth regressions, with no effect on institutional quality. While we find resource abundance to be significantly associated with both growth and institutional quality, the association runs contrary to the resource curse hypothesis: greater abundance leads to better institutions and more rapid growth ".(Brunnenschweiler C. N. and Bulte E. H., The resource curse revisited and revised: a tale of paradoxes and herrings, Journal of Environmental Economics and Management, 2008, p. 261)

hand, the dependence on these exports revenues will worsen as well the quality of these institutions, so as leading to a vicious cycle⁴⁸.

So we can say that till this point, the natural resource seems to play a role more close to a blessing than to a curse, but some signals as the increasing oil-export dependence, rising rents revenues and widening inequalities, let us see the possible negative path that Russia is pursuing.

According to this introduction, the next paragraphs will focus on the Dutch Disease as main cause of the Natural Resource Curse, analyzing if the actual short-run advantages will be greater than the long-run disadvantages.

3.1 Dutch Disease: Theory, Causes and Consequences

My analysis will be based on the core model presented by Max Corden and Peter Neary in 1982, which divides the economy in three main sectors: the energy sector or also called the booming⁴⁹ sector (B), the manufacturing sector or the lagging sector (M), and the service sector or the non-tradable sector (S)⁵⁰.

The main assumptions⁵¹ of the model, are:

⁴⁷Mehlum H., Moene K., Torvik R., Institutions and the resource curse, *Econ. J.* 116 (2006) 1–20.

⁴⁸This last effect is caused “ directly by a fight to control the resource rents, and indirectly by removing incentives to reform, improve infrastructure, or even establish a well-functioning tax bureaucracy. (Harford T., Klein M., Aid and the Resource Curse, The World Bank Group, Private Sector Development Vice Presidency, Note #291, Washington, DC, 2005)

⁴⁹According to Corden and Neary the main analysis is made on an extractive sector, even if it is applicable to any other sector that shows a boom caused by technological improvements.

⁵⁰The core model is the basic model on which many other more specific models can be built, and it will be used to understand how the effect of an energy boom affects the other two sectors of the economy, the manufacturing and services’ one.

⁵¹W. Max Corden and J. Peter Neary, Booming sector and De-industrialization in a Small Open Economy, *The Economic Journal*, Vol. 92, No. 368, December 1982, p. 826; Other specific cases has been analyzed as in Corden 1984, who extended the research on the effects created according to a wider range of assumptions, as for example A) international capital mobility, B) Immigration, C) Endogenous terms of trade effects, D) Domestic absorption effect, E) Classical Unemployment, and F) Dynamics: spending, saving and investment.

1. The model is closed and real, and ignores monetary aspects; this implies that only relative prices are determined, and domestic output and expenditures are always equal.
2. There are no distortions in factor market, that is, real wages are perfectly flexible, and that full employment is always maintained.
3. The booming sector and the lagging sector face given world prices, while the service sector does not⁵².
4. Output in each sector has a factor specific to that sector, that is capital, which is immobile, and a factor that is mobile - labor - , which equalizes the wage rate in the three employments.
5. Factor prices are flexible and all factors are internationally immobile.

The boom in the extractive sector can be provoked by three main causes, and they lead to similar effects but not identical. The first is an exogenous technical improvement⁵³, which leads to a shift in the production function, and it will be used as a main tool for the core model's analysis. The second is a discovery of new supply of natural resources⁵⁴, and the last, but not least, is an exogenous rise in the price of the energy sector in the world market⁵⁵.

According to these assumptions, the model works as follow.

The energy sector(booming-B) thanks to these reasons above explained, has seen a boom of output, which leads to an increase in the aggregate incomes of the employees in that sector.

⁵²The price of oil is supposed to be exogenous because it is determined by the adjustment mechanisms of the global demand and supply of oil. Obviously if Russia curbs its output, this will produce an increase of its price and vice versa. Said this an increase of the Russian oil output will not produce a reduction of the price of oil globally.

⁵³In the Russian case, as we have seen in the historical perspective, the technological improvement went always from outside, thanks to Western companies that owned better technologies. Usually the Russian governments attracted them showing the possibilities of huge revenues, but always after gathering what they were searching for, the technology, they used some legal expedient or unconventional methods to push them again out of the country.

⁵⁴As in the Russian case the rich Siberian oil fields.

⁵⁵This seems to be a clear trend of the last decade as for the future as explained in the previous part.

Through this we can have two types of effects, the Spending Effect and the Resource Movement Effect.

- The Resource Movement Effect: cause of the rise in the marginal product in the Booming sector⁵⁶, the demand for labor in B rises, drawing out labor force from the manufacturing sector and from the Service sector into the booming one.
- The Spending Effect: this effect can be direct or indirect, that is respectively provoked by the employees and the owners of the booming sector, or by the government through the tax's revenues which increase their spending on services.⁵⁷. Given a positive income elasticity for the Service sector⁵⁸, the prices of the services sector relative to the tradable sectors rise so as bringing a real appreciation⁵⁹. So this ratio can be considered as an approximation of the real exchange rate, so that it is possible to forecast a real appreciation of the domestic currency and a corresponding shift of the labor force into the non-tradable sector from the tradable one.

These two effects combined together bring to an important consequence through two paths.

The first is *direct de-industrialization* and implies a movement of labor force from the lagging sector into the booming sector reducing the output in the lagging one. This effect doesn't involve the service sector and it doesn't require an appreciation of the real exchange rate.

⁵⁶At a constant wage in terms of tradable.

⁵⁷This indirect effect is very important for the reallocation of the resources inside the economy. It is crucial to analyze on which commodities the tax's revenues is spent, because it can worsen the effects of the Dutch Disease. According to Oomes and Kalcheva, an increase about 1% of the Russian government's consumption leads to an approximate 1,5 % real appreciation of the Ruble. (IMF Working Paper, April 2007, p.13)

⁵⁸The marginal propensity to consume services is crucial to understand the weight of the spending effect on the real appreciation of the Ruble.

⁵⁹This is one of the most important consequence for the analysis. It is due to the fact that the prices of the tradeable sector, energy and manufacturing, are exogenous, so an increase of the price in the service sector lead to an increase in the ratio : $\frac{P_{non-tradeable}}{(P_{tradeable})}$, so as creating a real appreciation of the Ruble.

The second one is *indirect de-industrialization*. It is due to the fact that there is an excess of demand for the service output created by the spending effect, improving the real appreciation. This draws the labor force from the lagging sector to the service one, bringing the so called indirect de-industrialization effect.

As a conclusion, the main consequence of an increase of the extractive-oil sector output is a decline of the tradable sector output. This is caused by the change in the income distribution, that is, the real rent of the specific factor-capital, in the lagging sector gets lower. This is the essence of the so called Dutch Disease.

The side effect on the service sector output is ambiguous, as it has been showed, it is positively correlated to the spending effect, but negatively or positively to the resource movement effect. So If the spending effect tends to be stronger, the result will be an increase in the service sector output and in a stronger real appreciation⁶⁰.

The final effect on the real wages is also ambiguous; it is positive correlated to the resource movement effect, but both, negative and positive, on the Spending effect.

Usually in the case of extractive industries as the oil sector, it is assumed that the resource movement effect is small or irrelevant because it employs a very small part of the employed population⁶¹.

⁶⁰This has been deepened in Corden and Neary, which demonstrated that there is a correlation also between the resource movement effect and the spending effect. In fact when the income distribution changes, and it is assumed that the marginal propensity to spend on the service sector is identical and positive between all the factors, then the spending effect is not correlated to the resource movement effect and it will be always positive. But in the case in which the marginal propensity differs, the spending effect will depend on the resource movement effect by income distribution, and it could result, if the initial losers own a big share of the expenditure, in a final negative spending effect.

⁶¹In the Russian economy the mining and quarrying sector, according to the Federal State Statistics, employs around 1,5 % of the total employment in 2010, almost 1 million of people. Even more if we count only the oil and the gas sectors, this is still lower, almost 1 %. In addition in the Russian economy, and in the specific case of the extractive sector, there is a high rigidity of the labor market. This is due to the fact that the oil industry is located in Regions as Tyumen and Siberia, which present an environment adverse to human development, and even more a big shares of the new discoveries and oil fields are in the extreme North, which to be exploited

According to this, the case we are in is the so called “ Enclave “, where the labor force can only move between the Manufacturing and the Service sector. I want to remember that the specific factor –capital - is always fixed, so as only the mobile factor - labor - can move between sectors. So in this new model as written by Neary the booming sector doesn't participate in domestic factor markets⁶².

This could be a suitable model to relate for our analysis.

According to this new model, there is no more Resource Movement effect, so the labor force is not drawn into the booming sector from the manufacturing and the service sectors, other words there is no more direct de-industrialization. Only the Spending effect acts on this mechanism, and it leads to a real appreciation of the exchange rate, so as the de-industrialization happens by an indirect way. In this way at the end the output of the manufacturing sector declines while it increases in the service sector⁶³.

To understand how the Dutch Disease can affect the economy and which forms it assumes, it is important to underline that the assumption on factor mobility, both labor and capital, are crucial for the analysis⁶⁴.

required offshoring platforms that are practicable only few months per year cause of the arctic climate. This can let us state that the Resource Movement Effect is irrelevant in our case.

⁶²Corden W. M., Booming Sector and Dutch Disease Economics: Survey and Consolidation, Oxford economic Papers, New series, Vol. 36, No. 3, November 1984, p. 362

⁶³ The final effect on the real wages is still ambiguous because it depends only on the spending effect, which increases the output of the service sector, so as increasing the nominal wages, but also the price of the goods increases as well. So if the increase in the price is higher than the nominal income, the final effect will be a reduction of the real wage, if not, it will lead to an increase of the real income. This is strongly correlated to the shares of the service goods in the basket purchased by the Russian people, if they have a strong weight there is a high probability that the real income will fall.

⁶⁴ To complete the overview on the assumption I will briefly explain what happens in the case of specific factor mobility, capital, between the manufacturing and the service sector. In this case it is assumed also that capital can move between only two sectors, manufacturing and service, and that the former is capital intensive and the latter labor intensive. This model is called the Paradox Model because the boom-effect leads to a trend of *pro-industrialization* of the manufacturing sector by the resource movement effect. This effect can be offset through the real appreciation provoked by the spending effect, but however the final result could be an improvement of the lagging sector's output.

It is also important to comprehend another case, in which all the factors, capital and labor, are mobile between all the three sectors. The results will be dependent on which sectors are capital intensive. In fact according to Corden and Neary“ only in the case in which the capital-labor ratio in the manufacturing sector is intermediate between those in the other sectors is the de-industrialization the assured outcome”⁶⁵.

This last specific case can also be suitable for the Russian model because as we have seen the Energy sector, and in particular the oil industry, is heavily dependent on the level of technology. The exploitation of oil-wells in offshoring zones is getting harder and harder and requires huge capital investments⁶⁶. In addition to this, we have also seen how the oil sector is low labor intensive, so as reinforcing our presumption that the oil sector is more relative capital intensive than the manufacturing one.

In our specific case, we conclude that the Russian economy could fit the theoretic scenario which involves the Dutch Disease explained by the enclave model⁶⁷.

However even if the enclave can explain well the Russian case, it doesn't own the assumptions on free capital mobility and capital intensity. So another model could be still better, and it is the enclave (free labor mobility between manufacturing and service sector) with free capital mobility between the three sectors. This leads to deny the resource movement in the third models presented, having only the spending effect in a model of free capital mobility.

⁶⁵Ivi, p. 839

⁶⁶An appropriate example that emphasizes this requirement of enormous capital investments is seen in the exploitation of offshoring oil in the Atlantic sea in front of Santos, a location much easier than the Arctic one. To exploit the pré-sal oil field the Brazilian Government is committed to spend almost half of its current GDP over more than ten years.

⁶⁷ The possible models that can be feasible for the Russian Case are those follows: 1)The core model with fixed capital mobility and mobile labor force between the three sectors. 2) The special case of the enclave, in which the resource movement is denied towards the booming sector. 3) The last case in which there is free factors mobility between the three sectors, and in which the energy sector is relative capital-intensive.

So according to this an energy-boom will rise the output of the service sector, and the effect of the manufacturing output will be positive if and only if the ratio between capital-labor in the energy sector is intermediate between the other sectors, and as we have seen previously, this is not the case for the oil industry, and more precisely for the Russian economy.

It is reasonable stating that, theoretically, the Russian economy should face some consequences of the boom in the prices and in the production of the oil-gas industry, which are an increase in the service output as well as a contraction of the manufacturing sector, so as contracting the Dutch Disease.

However we have seen that the final result is a positive growth of the booming sector and a possible increase of output of the service sector, against only a loss, the slow-down of the manufacturing sector.

After all these considerations, however we might wonder why the Dutch Disease, which brings to a huge windfall of revenues, could be still considered such a negative phenomenon.

The relevant reasons for which this Disease is so worrying are :

1. Higher level of social and regional inequalities.

This symptom is due to the problem of a sharp rise in incomes of a small part of the population, the owners of the natural resources, compared to the majority of the population that sees a lower income growth, or even more an income stagnation process⁶⁸.

2. Macroeconomic Instability.

For a country that is so reliant on the exports of natural resource with volatile prices, this consequence is caused by the effect that these revenues have on the exchange rate. Given

⁶⁸Fetisov G., The Dutch Disease in Russia, Problems of Economic Transition, Vol. 50, No. 1, May 2007, p. 54; These inequalities are still more marked on a regional level. In fact often it is difficult for the government to redistribute the welfare in the economy, and often it is done by the tax revenues, which are spent on public services that are not transferable from one Region to another. In addition a higher unemployment is created in those regions where the lagging sector's goods are produced, so as worsening the imbalance between the economy.

the price for oil, an exogenous increase can lead to huge windfalls of revenues, and to an improvement of the current account. It consequently leads to a real appreciation of the currency exacerbating the Dutch Disease⁶⁹.

3. The trend is not reversible.

The irreversibility is the most important consequence from the point of view of growth sustainability and concerning the Russian case.

According to the Dutch Disease theory, an energy boom draws resources from the manufacturing and service sectors into the energy sector, and from the manufacturing into the service one. However after that, two variables result to be determinant to understand the real impact on the economy: the *size* and the *duration* of the transfer.

According to Krugman, a key factor is “ the role of the learning curves, that is, the existence of economies of scale in which cumulative past output determines current productivity ”⁷⁰. In this model “ the comparative advantage is created by the dynamics of learning rather than from national characteristics ”⁷¹. So now I will briefly explain how this model works and why this theory seems to turn the odds in favor of the curse’s perspective⁷².

In the short run a small increase in the transfer from BB to BB’ (the balance of payment), fig. 8A, brings to an increment of the country’s income but without changing the pattern of

⁶⁹ Contrary when the price suddenly falls, the external shock spread throughout the economy, so as leading to exchange rate depreciation and boosting inflation. More the country’s revenues is dependent on natural resources’ exports, the higher are the macroeconomic disequilibria.

⁷⁰ Krugman P., The Narrow Moving band, The Dutch Disease, and the Competitive Consequences of Mrs. Thatcher, *Journal of Development Economics* 27, 1987, p. 41

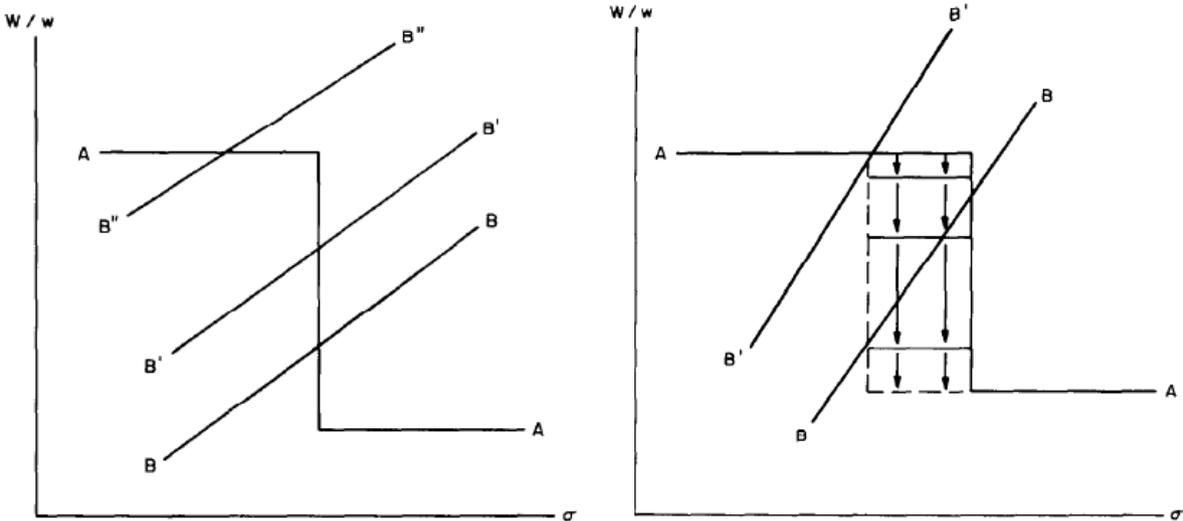
⁷¹ Ivi, p. 47

⁷² In this model, the main assumption is that the income earned by the resource sector is approximated by a transfer payment from the foreign to the home country. According to the graph, BB, the upward-sloping line is the balance of payment, and AA, downward slope curve is the level of productivity. Then there is *W*, wage, on the vertical axis, and θ , the share of the world tradable sector in the home country on the horizontal axis.

specialization. In the case of a bigger transfer, the increase in the relative wages will offset the productivity advantage and shift some industries abroad.

In the long run there are two possibilities. The shift of some industries abroad can be transitory, and when it ends the balance of payment returns to its original position BB , so as restoring also the previous pattern of specialization and the initial wages. The return to the original stage happens, only if the duration of the transfer is short. If the effects, for example an increase in oil production, or oil prices, is permanent or lasts for a long period, this leads to a permanent loss of that sector in the home country, in our case the Russian manufacturing sector.

Fig. 8A Short Run Impact of a Transfer Fig. 8B Long Run Impact of a Transfer



Source: Krugman (1987, p.51)

This is due to the fact that, according to fig 8B, the relative home productivity will decline over time in those industries that have been moved abroad, that is a loss in the productivity of the Russian manufacturing sector. This has been shown previously, according to figure 5, where the shares of manufacture imports on the trade balance increased over time, compare to manufacturing exports, which have shown a slow-down. This effect is clear if we look at the vertical part of the productivity line AA , which over time starts to reduce, creating a growing middle step. As a dramatic consequence, even when the external shock ends the manufacturing industries don't come back, but even more the economy will face a

permanent reduction of its home's country market share and of its relative wage. As Krugman writes "like a river which digs its own bed deeper, a pattern of specialization, once established, will induce relative productivity changes which strengthen the forces preserving that pattern"⁷³, as well the Russian Federation is digging its own grave, without realizing what it is going to face once the good fortune will end.

In the next two paragraphs I will investigate, if the theory is turned into practice, that is, if there is evidence of the just desired structural change.

3.2 Currency Rate Appreciation

3.2.1 Commodity Currencies

After analyzing the theory, i.e. the basis on which the investigation of the Dutch Disease has to be based, we can start to investigate if the first symptom, the appreciation of the currency, is already working.

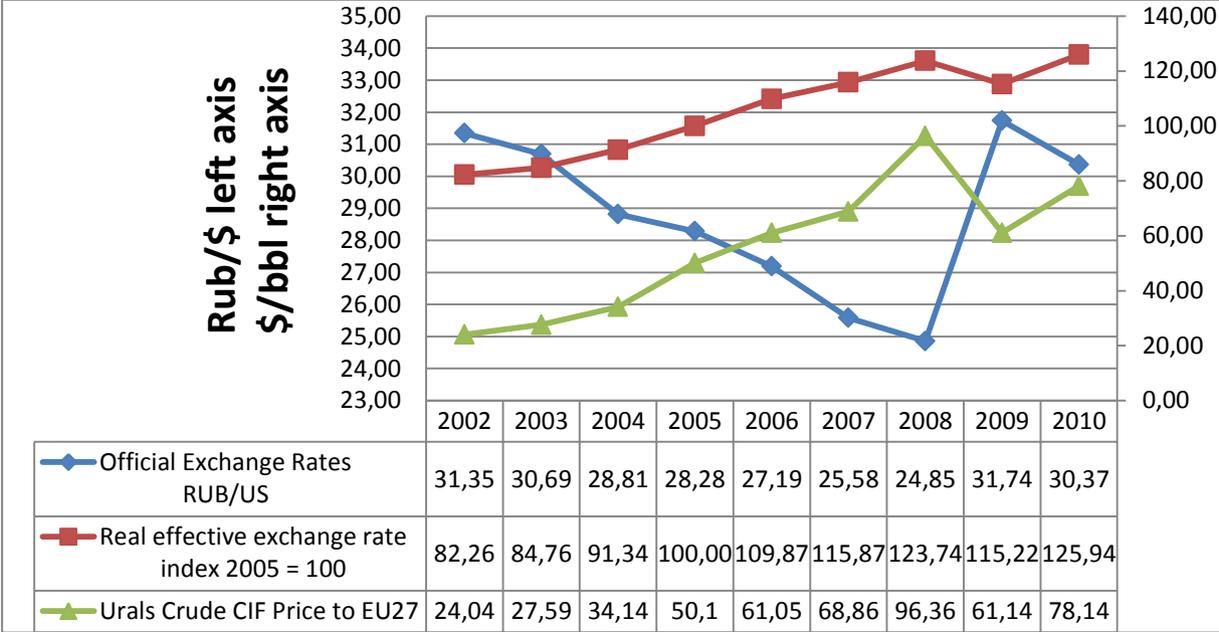
As we have seen in the historical perspective chapter 2, in January 1999 the Ruble had been depreciated heavily, almost by half in real terms cause of unilateral suspension of payments, which determined the Russian default. After that, the recovery of oil output and the rising prices, led to an enhancement of the economic activity, effacing the recession.

Giving a first look at fig. 9, we can clearly realize that, passed the recession, between 2002 and 2010 there was an appreciation of the Ruble against Dollar in real terms, from 40 Rubles for 1 Dollar to 20,8⁷⁴. So the real appreciation of the Ruble between 2002 and 2010 was about 48 %.

⁷³Krugman P., The Narrow Moving band, The Dutch Disease, and the Competitive Consequences of Mrs. Thatcher, *Journal of Development Economics* 27, 1987, p. 47

⁷⁴World Bank database, figure 1 appendix. To calculate the real exchange rate, I base my calculation on the consumer price index where 2005 = 100. So $Er = E * \frac{CPI(USA)}{CPI(Rus)}$; where Er is the real exchange rate, E is the nominal exchange rate, $CPI(USA)$ is the American consumer price index, and $CPI(RUS)$ is the Russian Consumer price Index. Given almost a fixed nominal exchange rate, we have that the greater increase of the Russian

Fig. 9 Commodity Currency Proof and Real Appreciation between 2002 and 2010



Source: World Bank database

This is due, as the figure shows, to the increase in oil prices which brought to a constant appreciation in nominal term, thanks to a partial accommodation policy of the Bank of Russia, and in real terms till 2009, when the price of crude collapsed, reaching the value of less than 60 \$/bbl. So between 2008 and 2009, the collapse in the price led to a collapse of the exchange rate in nominal terms. In fact, a negative shock is always heavier than a positive one in the Russian economy. We can see that the contraction of the oil price between 2008 and 2009 was almost of 36,5 %, and the collapse in the nominal exchange rate was about 27,7 %, while between 2007 and 2008 respectively the increase of the price was 40 % and that of the nominal exchange rate increase was less than 3 %.

So a positive/negative shock on the oil price of almost the same percentage has a totally different impact on the nominal exchange rate, if it is positive, the appreciation is very small, but if it is negative the depreciation is huge. A plausible explanation is given by the monetary policy used by the Central Bank of Russia, which during a positive price shock tries to offset

consumer price index (cause of a greater inflation, positive differential for Russia) compare with that of USA, leads to a reduction of Er that means less Rubles for 1 Dollar, a real appreciation.

the possible negative impact of a strong appreciation on the manufacturing and exporting industries, by increasing reserves of foreign currency, also called the sterilization process. However this will be analyzed better later.

Another effect that can be captured by the graph is that the real effective exchange rate (REER⁷⁵) is less conditioned than the real exchange rate concerning Ruble against Dollar, in fact during the negative and the positive shocks the change is smoother. The appreciation of the Real Effective Exchange Rate aims at emphasizing that the Ruble has experienced an appreciation against a basket of foreign currencies and not only against the Dollar.

The real appreciation of the Ruble is due to two possible reasons, the nominal appreciation of the currency, and the rate of the domestic inflation. Although usually the two effects have opposite signs, in fact a higher domestic inflation rate should depreciate the local currency while higher nominal exchange rate appreciates it, in this case they are not.

In our case the real appreciation is correlated to both effects. As we have seen the real appreciation has been linked to a nominal appreciation, but also according to fig. 2 in the appendix, to a spread of inflation rate. The differential of inflation between Russia and USA was almost 9,3 percentage points between 2002 and 2009, and only in the last year got smaller, almost 5,1 differential percentage points in 2010, but, nevertheless, the Ruble appreciated.

This real appreciation is a crucial fact as it squeezes profits and employment in manufacturing while the energy sector keeps on rising, benefiting on this currency appreciation. An excessive and long lasting appreciation will permanently reduce the competitiveness of the domestic industries, giving evidence of the existence of the Dutch

⁷⁵Real effective exchange rate refers to the weighted average exchange rate of the local currency vis-à-vis a basket of foreign currencies adjusted for inflation rate differentials with a country's trading partners. This is simply the Rouble's nominal exchange rate (NEER) multiplied with the ratio of the domestic price index to the weighted price index of the countries whose currencies comprise the NEER basket: $REER = (NEER \times P_j) / P_w$ where P_j is the domestic price index and P_w is the world price index. (Tàmàs Borkò, December 2007)

Disease. According to the data, this is the scenario that is facing Russia, an increase of the relative prices of the domestic products.

This effect could be also a consequence of the Balassa-Samuelson effect, in which the effect produced by the increase of the labor productivity in the energy sector on the wages in all the economy. But, for the Russian case, we can likely state that this effect doesn't play a key role.

According to Egert's study, who made a research on three countries of the Eastern Europe, Russia, and Turkey, there is evidence that the Balassa-Samuelson effect played a limited role for overall inflation and real exchange rate determination⁷⁶. In addition he also confirmed that inflation differentials, oil price shocks, cyclical factors and differences in growth rates, catching up in tradable, regulated-administered prices, and the credibility of economic policy, can be crucial variables in determining the real exchange appreciation⁷⁷.

Even more, in fig. 10 it is shown that the productivity level of Russia was one of the lowest in Europe between the Eastern Europe Countries, at the same stage of Romania and Bulgaria, almost less than 40 % of the German one. Also the gross wage relative to productivity is very low, Russia was at the same level of Ukraine, Lithuania and Slovakia, almost 40 % of the Austrian gross wage.

⁷⁶Egert B., Balassa Samuelson Meets South-Eastern Europe, the CIS and Turkey: a Closer Encounter of the Third Kind? The European Journal of Comparative Economics, Vol.2, No.2, 2007, p. 222

⁷⁷Tamàs Borkò, The suspicion of Dutch disease in Russia and the ability of the government to counteract, Working paper No. 35, ICEG European Center, December 2007

Fig. 10A Russian Productivity Level⁷⁸

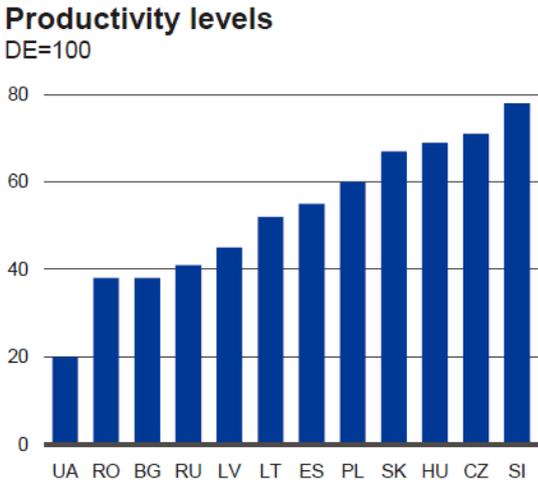
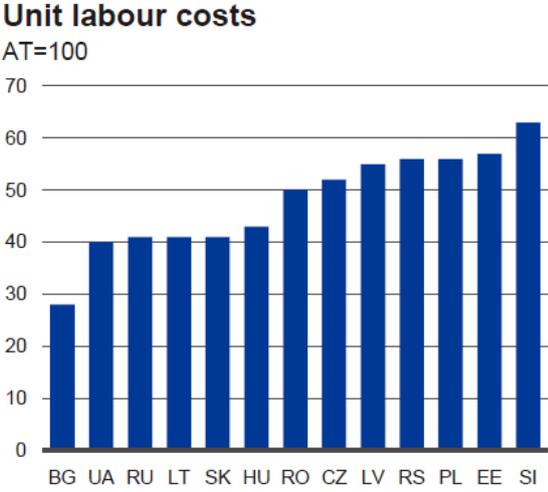


Fig. 10B Russian Unit Labor Costs⁷⁹



Source: Deutsche Bank Research(September 2010, p. 24)

Both these considerations let us realize how the level of productivity can't affect the real exchange rate.

So the last consideration is that the real exchange rate is heavily correlated to the oil price, and this is due to the big weight that oil exports revenues have on the Russian gross domestic product. According to this, as conclusion we can state that oil price and output, are a key variable in determining the fluctuations of the Russian real exchange rate, so as affirming that Ruble can be considered as a *commodity currency*.

3.2.2 Monetary Policy

Introduction

This paragraph aims to explain the role that the Bank of Russia plays, and what the main intervention tools are used to offset the huge oil windfall's revenues and their side effects.

First of all I have to notice that, according to the Big Mac Index developed by The Economist, which analyzes the real cost of a Big Mac in different countries, and which is used to

⁷⁸Where DE is Germany and AT is Austria.

⁷⁹Gross Wages in EUR relative to labor productivity.

calculated the exchange rate appreciation/depreciation in real term basing on the purchasing power criteria, Ruble is still under-evaluated against the dollar since 1999 when Russia declared the default. The devaluation has been around 50 % of the value, and after that the Ruble has started again its appreciation.

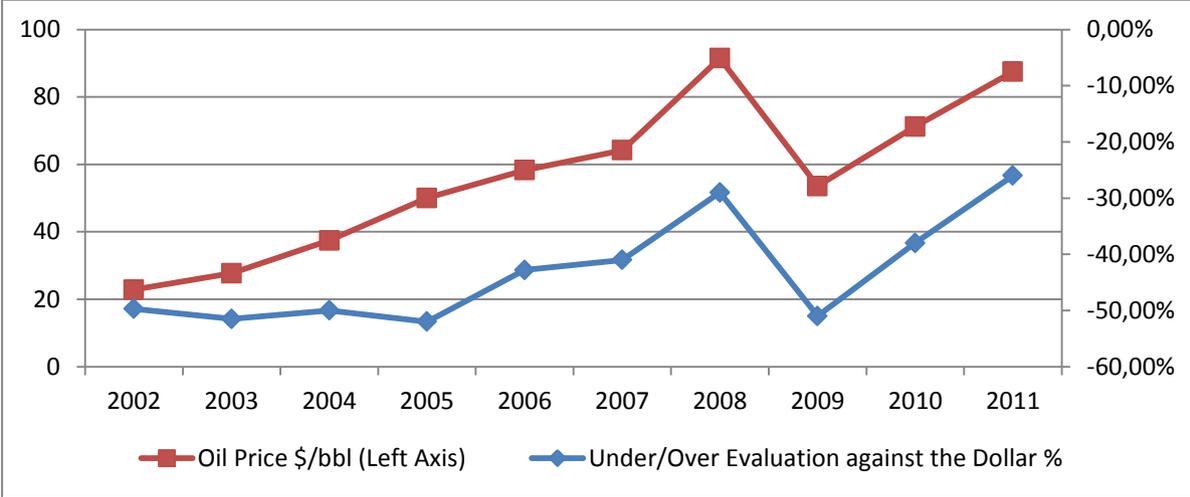
According to fig. 11, which shows in purchasing power terms the real exchange rate of the Ruble against the Dollar⁸⁰, we can notice that in 2002 the Ruble was still under evaluated almost of 50 %, and it lasted around this value till 2005. With the raising of oil price above the threshold of 50 \$/bbl the real appreciation of the Ruble started to increase strongly, in fact we can see a strong correlation between the oil price and the real appreciation.

In 2011 the Ruble was still under-evaluated about 26 % against the Dollar. This real under evaluation should facilitate the manufacturing sector in exporting, but as we have seen this has only benefited the exports of energy as oil and gas, without enhancing the competitiveness of Russian machinery and vehicles producers.

If the manufacturing sector hasn't found its growth-path in 2000 when the Ruble was depreciated about 50%, it is difficult that now, even if the Ruble is still strongly depreciated, the manufacturing sector would re-start to grow and export. A possible explanation already mentioned in the first paragraph of this chapter is that we can re-conduce this situation to the possible case of a too long lasting external dependency on oil revenues theorized by Krugman.

⁸⁰These calculations are based on table-2 (appendix), which is based on the Big Mac Index database of The Economist between 2002 and 2012.

Fig. 11 Under evaluation of Ruble & Crude Oil Price



Source: The Economist (Big Mac Index), 2012; World Bank database

Bank of Russia’ Role and its policy

Now I will analyze the strategies adopted by the Bank of Russia (BoR) to offset the negative effects of huge exports revenues.

In the last decades the BoR’s monetary policy was oriented to pursue the stabilization of the exchange rate so as creating less uncertainty. But recently this trend has been reversed, passing from a fixed exchange rate to a semi-flexible exchange rate, and now to an almost floating exchange rate. This is due to the fact that now the main goal of BoR is to fix the price stability, in other words, reducing the inflation.

This transition was necessary above all after the financial crisis of 2008, which led Russia in a strong recession⁸¹. In addition an exchange rate flexibility is a precondition to succeed in controlling the supply of money by the interest rate mechanism. This is also strongly crucial in the Russian economy, which, according to table 2 (appendix), has shown high level of inflation, almost around 9-10 % in the last decade. This has led real interest rate to negative values between 2002 and 2010, which on average fluctuated around – 2%. This has a

⁸¹One of the main advantage of a floating exchange rate is that it helps to insulate economies from recession originating abroad.

negative impact on sustainable growth, because it gives a strong incentive to Russians to not saving⁸², so as decreasing drastically the level of future investments. This is confirmed by the value of the gross capital formation as % of GDP, which in 2010 was around 22 %, much lower than many other emerging markets such as China and India, respectively 48% and 35% in 2010⁸³.

According to fig. 3 (appendix) we can overview how these mechanisms have worked between 2006 and 2011. The increase in the oil price has affected the current account balance, which since 1999 has shown a positive growth on average around 9 % of GDP⁸⁴. This has increased strongly the foreign-exchange reserves which passed from \$ 48 billion in 2002 to \$ 479 billion in 2010, only China did better in the same period. But as we can see, between 2008 and 2009, the financial crisis and the oil price-fall drove the Ruble to a depreciation in nominal term about 30 %. In that moment the BoR tried to intervene on the foreign exchange market, selling foreign currency, dollars, to buy Rubles, sustaining the local currency, but the crisis was too strong. The foreign exchange reserves passed from \$ 478 billion in 2008 to \$ 426 billion in 2009, a net loss of \$ 52 billion⁸⁵.

This intervention is clear if we look at fig. 12. The BoR started to reduce foreign-exchange reserves to avoid the Ruble's depreciation, it made 5 big interventions (purple line down-oriented) before the transition to a floating exchange rate. We can see that during the crisis the fixed band (nominal exchange rate) started to climb, passing from 30 Rubles to 40 in the beginning of 2009. At that point, as we can see in the graph, there has been implemented an automatic system of adjustment, which owns two flexible bands correlated to the volumes of foreign-exchange reserves. Every time that it is reached a threshold of accumulation the

⁸²We have to notice that a low saving rate leads to greater capital inflows as loans and FDI, causing a real appreciation. So increasing the saving rate is a precondition to mitigate an overshooting of the real exchange rate.

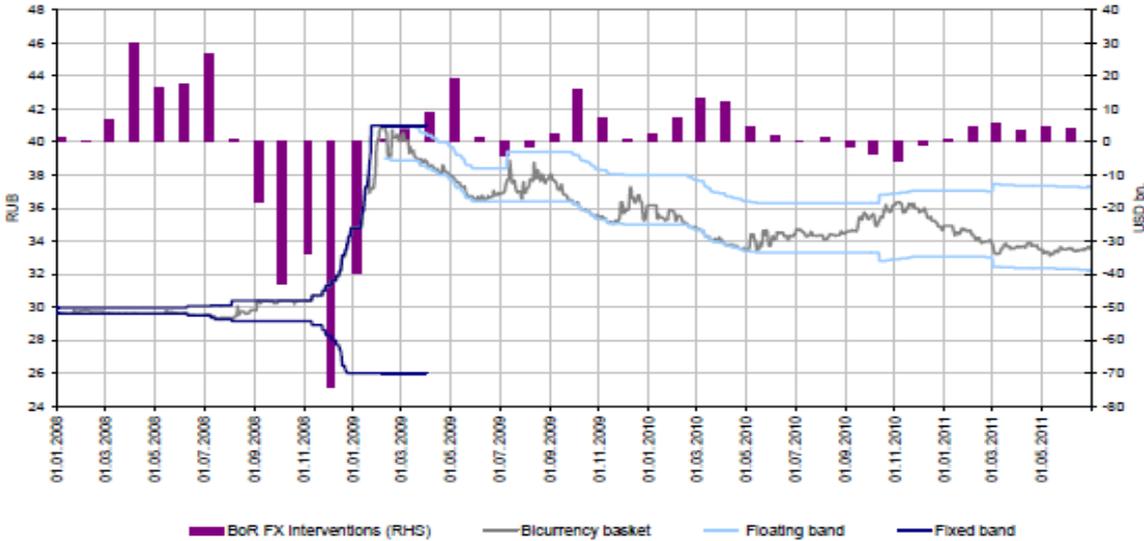
⁸³World Bank database, 2012; In addition we can see that the gross savings as % of GDP are also quite lower respect other emerging economies as China and India. In fact Russia saves around 28,5 % against 53 %of China and 34% of India.

⁸⁴World Bank database, 2012.

⁸⁵We have to consider that the peak was much bigger than 58 billion, in fact variation within the same period 2008 was more than \$ 100 billion according to fig. 3A in the appendix.

two flexible boundaries are automatically adjusted. So when it is reached a positive accumulation of foreign reserves (purple lines up-oriented), automatically there is an exchange market intervention to offset the constant fluctuation of the Ruble, so a reduction of foreign reserves. This was implemented to correct the imbalances between supply and demand in the foreign exchange market.

Fig. 12 Foreign Exchange Interventions and Exchange Interventions Rate Dynamics



Source: BIS Paper No. 57

But a question naturally arises: what is the effect of this intervention on the real economy, and is this the best way to offset the negative effects produced by large oil revenues?

According to Corden the best way to protect the manufacturing sector by a process of de-industrialization is to subsidize directly the affected sector using the tax oil-revenues coming from the booming sector⁸⁶. In addition he stated that two other types of interventions are often used instead of that previously mentioned, but they result to be plainly inferior:

1. Exchange Rate Protection
2. Ordinary Protection

⁸⁶Corden, Booming Sector and Dutch Disease Economics: Survey and Consolidation, 1984, p. 375

These two types of interventions are used both by the Russian government as main tools to implement the economic policies.

The former, as we have seen previously, was strongly used by the Bank of Russia after 1999, and only in the last couple of years it has passed to a more flexible exchange rate, but without avoiding the reserves accumulation⁸⁷, and only reducing their impacts on the foreign exchange market. This system works through the process of sterilization, which is used to limit the spending effect⁸⁸, avoiding an overshooting of the economy and of the exchange rate. But the problem is that this mechanism leads “to an excessive accumulation of foreign assets and that it would protect not only the lagging sector but also the booming one”⁸⁹.

The latter is even worse. An increase in import quotas or tariffs will induce a real appreciation of the Ruble and will reduce the range of goods importable from Russians, so as having the opposite effect. As we have seen Russia doesn't enjoy a good quality of intermediate technologic goods that are the basis for the development of other related commodities, shrinking even more the possibilities of the manufacturing sector. This at the end will lead to a permanent reduction of real wages and consumer's range of purchasable goods.

The last consideration about pursuing the price stability instead of the exchange rate control is that a contraction of the money supply, mandatory path to reduce the inflation, manifests itself by the exchange rate channel, leading to a real appreciation and so to a consequent loss of competitiveness⁹⁰. This is one of the main future problem that the Bank of Russia is

⁸⁷According to Oomes and Kalcheva an increase of 1% of Net International Reserves reduces the real exchange rate of Ruble by 0,18 %. (IMF Working Paper, April 2007, p.13)

⁸⁸The spending effect can be reduced through a budget surplus or by an increase in foreign exchange reserves accumulation.

⁸⁹Corden, Booming Sector and Dutch Disease Economics: Survey and Consolidation, 1984, p. 375

⁹⁰This was the main problem faced by U.K. under Margaret Thatcher, and it was engaged by implementing a mix of policies passing through market intervention's controls and trade policies.

going to face in the next years after having adopted this new monetary policy⁹¹. Even more, according to Neary and Wijnbergen who made a research regarding if an oil discovery can lead to a recession, they found that “ the direct Wealth effect of higher oil wealth increases the demand of money, which, given the nominal money supply, subjects the economy to a contraction shock which may sufficiently offset the direct expansionary effects of oil discovery on domestic spending”⁹². The conclusion is that to avoid the recession an accommodating monetary policy is needed, that is an increase in the supply of money.

But this as explained previously goes in the opposite direction of the new strategy of price stability pursued by the BoR, and so it could result almost impossible to achieve this target. Even more a possible rising pressure on Ruble made by financial markets through capital inflows as FDI could make the Bank of Russia come back on its footprints, and making this process a vicious cycle⁹³.

As conclusion we have seen that pursuing the right monetary strategies to offset the negative effect of a real appreciation seems to be a very difficult striving target for the Bank of Russia, and that most of its implemented policies are unproductive or even more destabilizing. Finding the possible solution to the Dutch Disease based on a clear view on the monetary policy to pursue, will be crucial to change direction towards a sustainable growth.

3.3 Declining Manufacturing Sector and Growing Service Sector

In this paragraph I will analyze the output growth, the employment composition and nominal wages growth. This part aims at discovering if there has been a relative reduction of the output in the manufacturing sector comparing with the energy and the service sectors. If there has been a process of direct and indirect de-industrialization of the manufacturing sectors, but as we have said in theoretic analysis, this effect should be small in the economy

⁹¹Krugman P., The Narrow Moving Band, the Dutch Disease, and the Competitive Consequences of Mrs. Thatcher, *Journal of Development Economics* 27, 1987, p. 52

⁹²Neary J. P. and Van Wijnbergen S., Can Oil Discovery Lead to a Recession? A comment on Eastwood and Variables, *The Economic Journal*, June 1984, p. 394

⁹³This appreciation trend after the passage to a floating exchange rate is quite visible according to fig. 3B in the appendix.

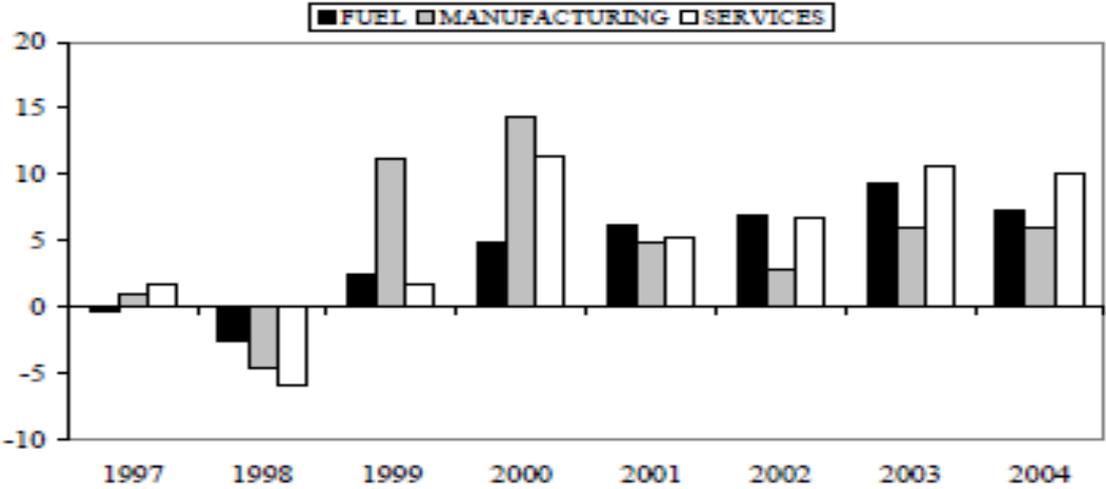
of Russia. The last part will focus on the analysis of the wages growth between three sectors. This is useful to verify when Russia has contracted the Dutch Disease.

The first thing that we can see according to figure 13 is that after the Ruble's devaluation in 1999, the output of the three sectors started to recover, and mainly that of the manufacturing one, which shows a growth average higher than 10 % in 1999 and 2000. Since 1999 the output growth of the manufacturing sector started to grow slower for four years till 2004. According also to fig. 3 in the appendix, which represents the output development by each economic activity between 2003 and 2006, the slow-down of the manufacturing sector (D), was obviously the main contributor to the slow-down in the industrial production. In addition, looking at fig. 13 the energy sector' output grew rapidly for five years thanks to the strong oil price increase, respectively 21 % and 35 %, 35 % and 17 %, an average of almost 27 % growth per year. The service sector did even better than the energy sector in 2005 and 2006, which grew at a rate of almost 10 % both years. This cause-effect can be analyzed from the suggestive point of view that a boom in the oil sector in 2003 and 2004 led to a rising consumption for service, boosting its output. More precisely, according to the theory, an increase in the oil price and so of the productivity of the energy sector and its relative wages compare with the other sectors, induced the government and the renters of the booming sectors to increase the consumption in the service sectors⁹⁴. The rise in demand for services pushed up the employment, which, with a small lag, adjusted its output as well. In fact we can see that in 2004 the production service growth increased by 1 % compared to the previous year, and whereas in 2005 it increased of 5 percentage points. This could be explained by the fact that the rising consumptions can be delayed in time, so in the first period the government and the renters will spend only part of the new windfalls because they are not sure if this bull trend will last. But when they realized that the price increase was stable, the consumption's expenditure on services grew faster, and so also the service sector started to feel that the trend wasn't temporary, allowing the service producers to make investments to increase the production capacity. The results of these investments

⁹⁴As we have explained in the theoretic part, this depends on the consumption propensity for services of the government and of the employees and renters of the booming sector. If this propensity is high, the impact on the service output will be much strong.

were visible in 2005 and 2006 when the service sector grew 5 percentage points higher than 2003, and 4 percentage points higher than 2004.

Fig. 13 Output Growth by Kind of Economic activities



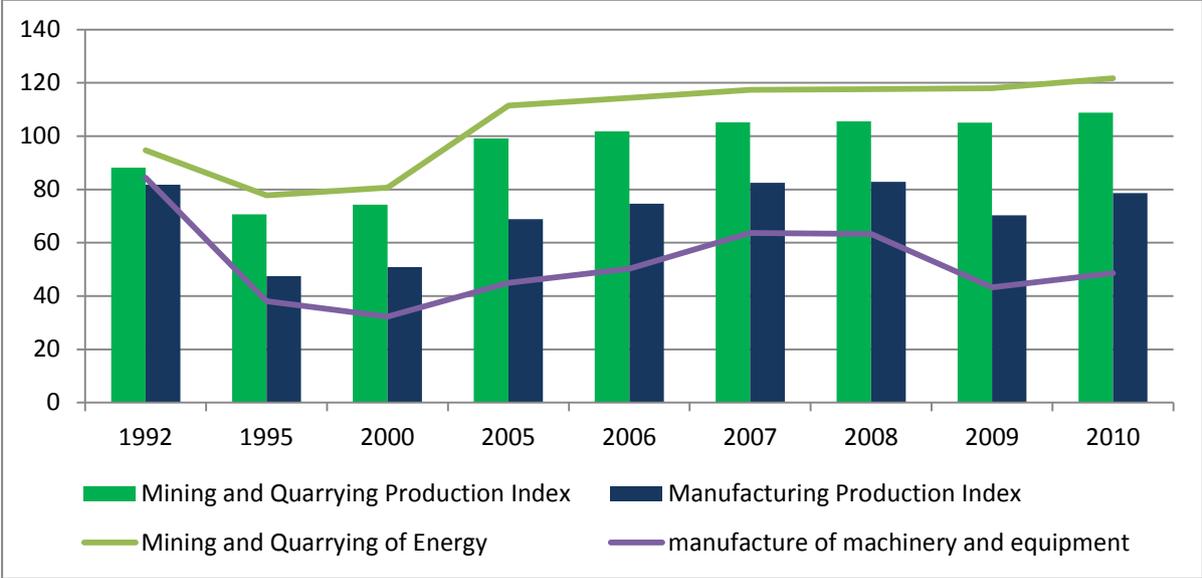
Source: IMF

In addition to this output growth analysis between the three sectors, if we look at figure 14⁹⁵ we can see that between 1992 and 2010 the gap measured by the production index between mining and quarrying sector and manufacturing one has been widened.

In 1992 the gap between the two sectors was about only 6 points, in 2000 the gap passed, even with the depreciation, to 14 points, and to reach at the end the value of 30 points in 2010. This data is still more pronounced if we look at the difference between the mining and quarrying sector producing energy and the manufacturing sector producing machinery and equipment. In 1992 the gap in the production index was about 10 points, in 2000 it passed to 48 points, to reach in 2010 the value of 73 points. This confirms the previous results, a loss in the competitiveness of the manufacturing sector and an increasing imports volumes of the V.I.M. product categories from abroad, mainly as we have seen from EU-27, which owns a relative competitive advantage in the production of technologic goods.

⁹⁵The extended and deeper version of this figure can be found in the appendix, fig. 4 and fig. 5.

Fig. 14 Production Index by sector (1991=100)



Source: Federal State Statistics Service

The second symptom that has to be verified is the de-industrialization process.

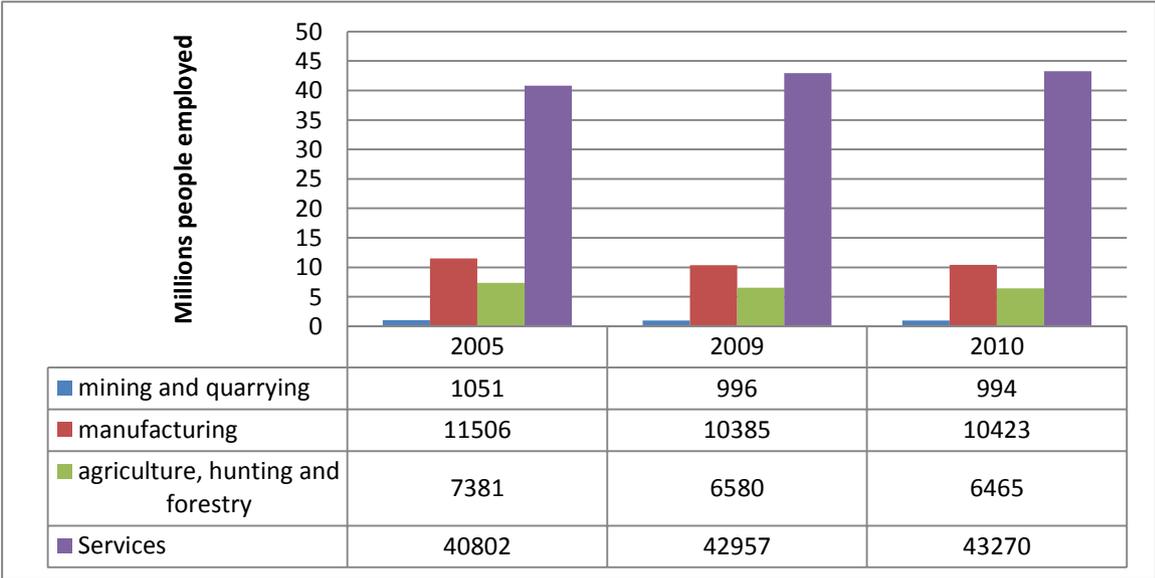
According to figure 15⁹⁶, in which employed people are divided by kind of sectors, we can see mainly that the service sector owns the biggest share of employment, 43,3 million of employees, almost 60 % of the total. The energy sector, mining and quarrying employed a very small part of the labor force, less than 1 million, almost 1,5 %. This, as previously mentioned, can lead to the conclusion that the direct de-industrialization effect, the shift of the labor force from the manufacturing sector to the energy sector, can be neglected. The percentage change in the labor in the energy sector was 1,6 % in 2005 to 1,5 % in 2010, and in absolute term around fifty thousand people.

That said, we have to focus the attention on the other three sectors, agriculture, hunting and forestry (AHF), manufacturing and service. The A.H.F. shows a decrease of the employed people between 2005 and 2010, almost of 1,5 %, passing from 11,1 % to 9,6 %, around 1 million of employees in absolute term. Still more important for our analysis is the decrease in the labor force of the manufacturing sector, almost 1,8 %, passing from 17,2 % to 15,4 %

⁹⁶ The extended version of this figure is in the appendix fig. 6.

between 2005 and 2010, more than 1 million people. In total the three sectors, energy (with a smallest change only 0,1 %), manufacturing (with the biggest change) and AHF, showed a decreased of the labor force all together about 3,4 %, which went to increase that of the service sector, the winner, which passed from 59,6 % in 2005 to 62,7 % in 2010, almost an increase of 2,5 million of people. Keeping in mind that it is very difficult both to divide the movements of the labor force between sectors and to address the reasons why there has been these movements, linking to the data, we can affirm that the reduction of the manufacturing sector’s labor force and that of the AHF’s sector went to benefit the service sector, which was the only one to see a growth path. However this result is also explicable by the fact that the more a country goes away from the state of emerging country toward the stage of developed, the service sector should acquire always more relative importance compare with the agricultural and industrial ones.

Fig. 15 Employment by sectors in absolute value



Source: Federal State Statistics Service, values in thousand.

The last symptom, but not the less important in our analysis is the wages growth.

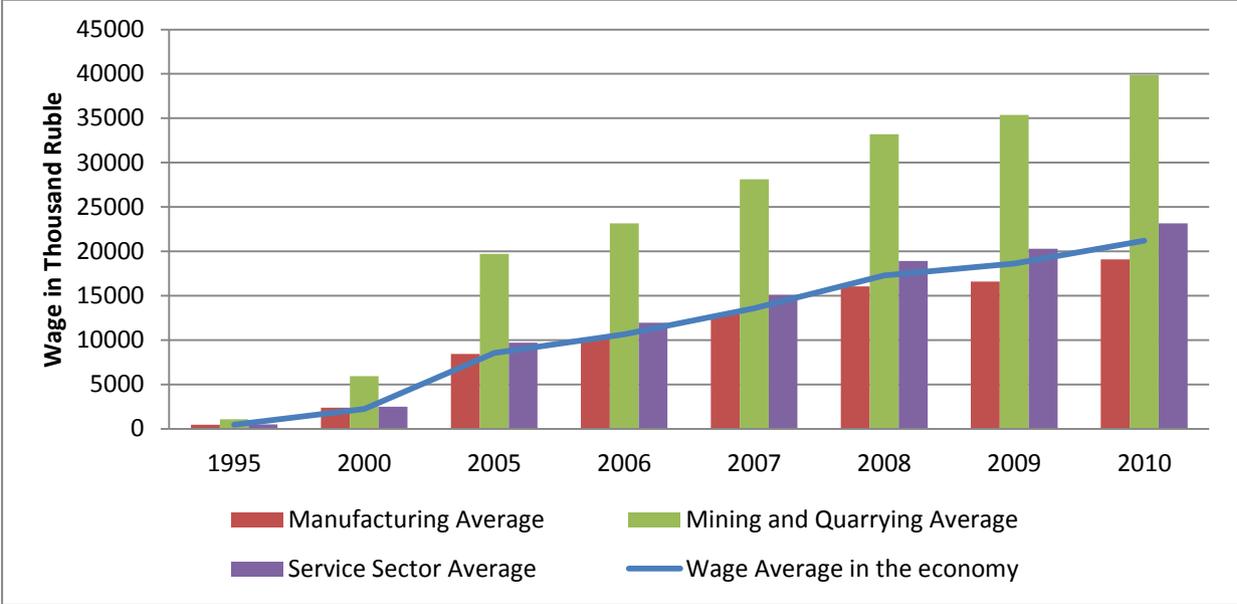
This part tries to focus the attention on which sectors in the economy own a higher relative productivity measured by the average nominal monthly wages, driving the possible shifts of the labor force between sectors and also the specific output growth.

According to figure 16, the energy sector already in 1995 presented an average nominal wage higher than that of the other sectors, manufacturing and service, almost double. It was 1.000 Rubles against 450 of the manufacturing and 500 of the service sector. In 2000 two things are important to underline, the growth of the energy sector was much faster than the other sectors and that the manufacturing sector grew fast as well as the service one, in fact respectively the nominal monthly wage was 5.940 Rubles for the energy sector, 2.365 Rubles for the manufacturing sector, and 2.470 Rubles for the service sector. The 2005 is a turning point year, the growth wage of the energy sector widened the gap with the other two sectors and the service sector started to take a relative margin against the manufacturing one. The nominal wage passed to 19.700 Rubles for the energy sector, to 8.400 Rubles for the manufacturing sector, and to 9.700 for the service one.

In 2010 we can see in the graph 16 that the blue line that represents the average wage in the economy has under itself only the average nominal wage of the manufacturing sector.

In real values this gap is shown for the energy sector by the passage between 2005 and 2010 from 19.700 Rubles to 39.800 Rubles, for the service sector from 9.700 Rubles in 2005 to 23.100 Rubles in 2010, and for the manufacturing sector from 8.400 Rubles in 2005 to 19.100 Rubles in 2010.

Fig. 16 Average MonthNominalWages by Sector 1995-2010⁹⁷



Source: Federal State Statistics Service

To deepen our analysis we can see according to fig. 7 in the appendix that the nominal monthly wage for the mining and quarrying sector producing energy was the second highest in the economy after the financial sector with an average of 46.300 Rubles in 2010. This value has to be compared with the mining and quarrying sector except producing energy, which shows a wage average of 28.000 Rubles in 2010. So the gap between the manufacturing and the mining and quarrying sector producing energy is still wider, almost of 27.200 Rubles. An employee that works in the mining and quarrying producing energy sector gains more than double of what the one that works in the manufacturing sector gets.

Even more, if we look at fig. 8 in the appendix, which shows the difference in monthly nominal wage among the kind of activities in the manufacturing sector, we can see that the specific sector that brought up the average wage of the manufacturing sector is manufacture of coke-refined petroleum products. This sector has, on average, a nominal monthly wage of 42.000 Rubles, which classified itself as third in the ranking of highest wages by economic activities. Making a comparison with other manufacturing activities, the petroleum refining sector shows a nominal wage four times higher than manufacture of textile (10.100 Rubles)

⁹⁷Price Fixed in 1991; For a deeper analysis of the sub-categories look at the appendix fig. 7-8-9.

and manufacture of leather (11.000 Rubles) in 2010. Also if we compare it with higher competitive sector as manufacture of chemicals products and manufacture of machinery and equipment the wage gap is still quite big, respectively 19.000 Rubles and 22.000. As we can see, also in the manufacturing sector, the activity that has the highest productivity is almost totally linked to extraction and production of oil and its derivatives. This gives evidence of the strong incentives that an employee has to work in petroleum activities, both mining and quarrying producing energy and manufacture of coke-refined petroleum products.

3.4 The Lack of Financial Resources: FDI Solution?

In the last part of this chapter I will investigate the effects and the causes for which this mechanism of wage-incentives has exacerbated the situation, and through which channel it works.

This unproductive system of wage-incentives exacerbated the effects of the Dutch Disease bringing the economy to greater inequalities between sectors as well as between employees. In fact this happens for the former category - sector - because the gap in wages brings the most qualified people to specialize and work for the specific sector with the highest nominal monthly wage, in this case the petroleum sector. For the latter category - employee - , that doesn't work in the petroleum industry, the majority of the employed labor force, has a much lower nominal wage compare to the employees of the oil and related sectors, so as destabilizing even more the unstable economic climate.

Concerning this last issue, the high energy price and the volatile food prices, which depends both on incontrollable cyclicalities, are crucial determinants for the Consumer Price Index as well as for the Russian citizens. So a faster growth of the energy sector, which, as we have seen, accounts for more than 25 % of the Russian GDP, could lead to an overheating of the economy against the majority of the population, which saw their nominal wages remaining

constant or growing at rate often lower than the rate of inflation⁹⁸. This can be called a fake growth because the GDP grows but only for specific sectors of the economy, as well as for specific categories of workers.

This situation worsened also because the Russian monetary policy has always tried to achieve multiple targets, trying to control the exchange rate and at the same time the inflation rate. But in the Russian economy, highly prone to external shocks, this goal has been much more difficult to pursue than in other countries. The basic problem is that an increase of the interest rates to reduce the money supply so as curbing the inflation, produces a nominal appreciation⁹⁹ of the exchange rate thanks to the channel of free capital mobility.

In addition this increment of the interest rates¹⁰⁰, in return, leads to an overheating of the interest rate on loans¹⁰¹ to private citizens and firms, contracting the access to credit. At the end this contraction of credit, mixed with a low saving rate, the only other domestic way to finance investments, brings the economy to grow at a rate much lower than its potential.

If we look at the Russian lending interest rate, it has been around 12 % in the last ten years, with a peak in 2009 that reached 15,3 %. Obviously this is a big disincentive to invest, and only the sector with the highest productivity, the petroleum one, can permit to secure a loan. This is still more evident if we make a comparison with China, which to boost its growth and investments has pursued in the last ten years an average lending interest rate around 5,8 %, less than half of the Russian one.

However, as we will see further, the problem concerning the lack of financial resources will play a crucial role in restricting Russian enterprises' output.

⁹⁸ Only in 2010 the inflation was around 5 %, but in the years before it has always been around 7-8 %, and also in 2011 and 2012, with the stable growth of oil price the inflation shows a trend back to the previous value of 2010.

⁹⁹ A real appreciation happens only if the increase in the nominal exchange rate is higher than the decrease of inflation rate. Russia, as explained before, to pursue both targets, has always made interventions on the foreign exchange market, buying foreign currency, so as offsetting the nominal exchange appreciation.

¹⁰⁰ Refinancing rate of the Central Bank to the commercial banks.

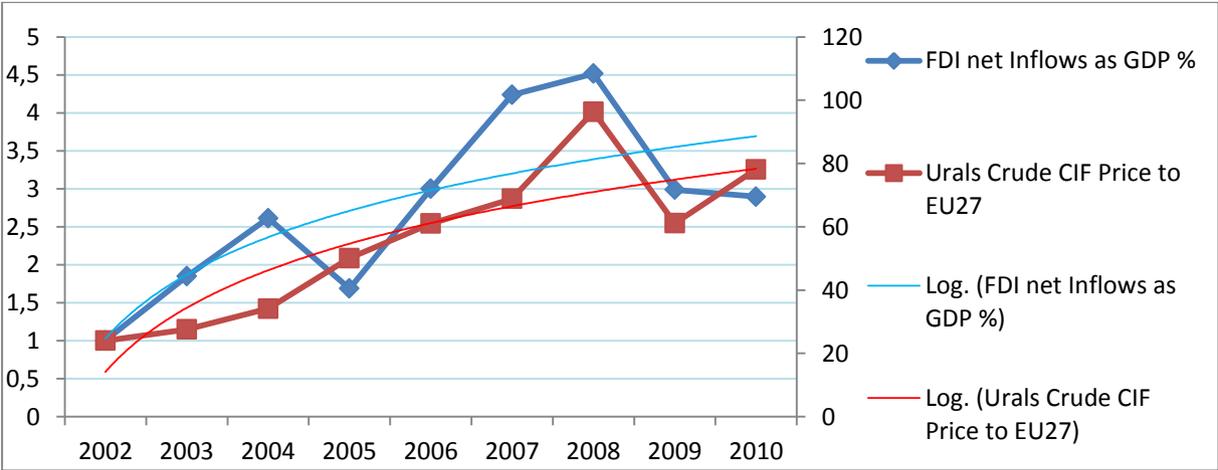
¹⁰¹ The lending rate of the commercial banks to the non-bank private sector.

The other possible way to get access to financial resources, which has been used as main investment-tool in the last decade, is through the foreign direct investment channel.

According to the World Bank statistics the cumulative inflows of Foreign direct investments passed from \$ 3,5 billion in 2002 to \$ 278 billion in 2010¹⁰². This obviously has contributed to boost the real appreciation so as exacerbating the effects of the Dutch Disease.

Looking at fig. 17 we can see a suggestive image about the FDI trend and that of the oil price. The tendency curves show that when the price of crude goes up, consequently also the inflows volume of FDI in percentage of GDP increases. In fact when in 2002 the oil price was, on average, about 24 \$/bbl the ratio of FDI on GDP was almost 1 %. In 2010 when the crude average price passed to 78 \$/bbl the ratio of FDI on GDP jumped to 3,3 %, with the highest peak recorded in 2008, when the oil price reached on average the level of 96 \$/bbl and the ratio of FDI on GDP reached the level of 4,5 %.

Fig. 17 FDI Net Inflows as GDP % and Urals Crude Oil Price



Source: World Bank database

However, to understand if it is only a fascinating coincidence, I will go deeper into the analysis, looking at the subdivision of these FDIs by kind of economic activities.

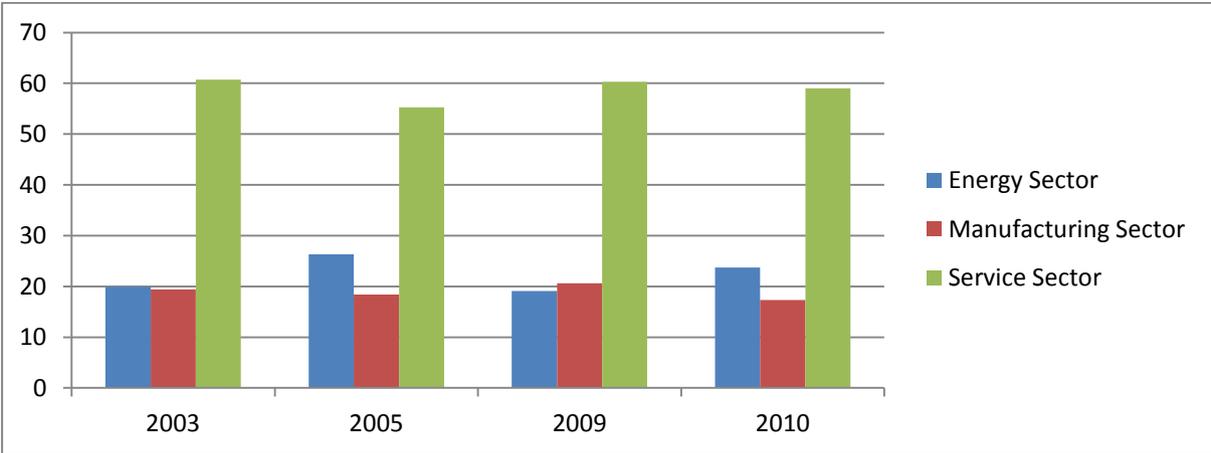
¹⁰²World Bank database 2012.

According to fig. 18 we can see that the main collector of Foreign Investments is the service sector with almost 60 % of the total between 2003 and 2010. The main performer categories are wholesale & commission trade, real estate, renting & business activities and financial activity, which, the latter alone, accounted for almost 33 % of the total in 2010.

But the more relevant data is for the energy industry which, comprehending mining and quarrying sector and manufacture of petroleum, accounted for more than 20 % of the total on average. This doesn't seem to be a relevant number if we look at the absolute value, but if we look at this in relative terms our initial idea changes.

Comparing the energy sector with the wide service and manufacturing sector, which employs respectively the 62,7 % and 15,4 % of the labor force in 2010, the ratio between foreign Investments and people employed is totally in favor of the energy industry. In fact this ratio for the mining and quarrying sector was 8 in 2010 compare with 1,9 for the manufacturing sector and 1 for the service sector¹⁰³.

Fig. 18 Inflows of Foreign Investments by Kind of Economic Activities in %



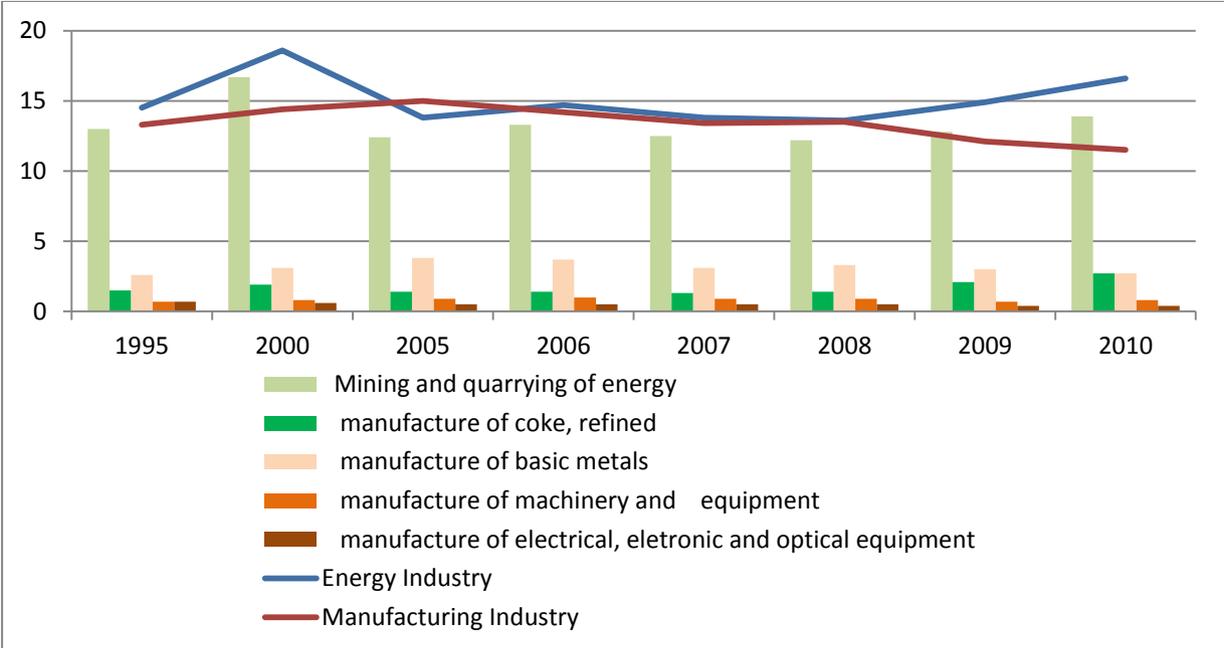
Source: Federal State Statistics Service

Even more if we look at fig. 19, which shows the structure of investments in fixed capital by kind of economic activities, we can see that, on average, the manufacturing sector is slowing down, whereas the energy industry is going up, widening the gap already evident. In

¹⁰³Federal State Statistics Service database, based on own calculations.

addition we can notice that none of the principal manufacturing categories can be compared with mining and quarrying sector in term of fixed capital Investments.

Fig. 19 Structure of Investment in Fixed Capital: Comparison among Energy Industry and Manufacturing Sector between 1995 and 2010



Source: Federal State Statistics Service

The problem concerning the lack of financial resources is crucial for the growth of those sectors that don't attract foreign investors as the petroleum industry does. In fact, according to fig. 11 in the appendix we can see that the common problem concerning factors restricting the increase in production, for the manufacturing and mining and quarrying sector, more capital intensive than the service one, is the lack of financial resources, while for the service sector the main issues are competitive imports and uncertainty of the economic situation. This latter issue penetrates throughout all three sectors as main factor restricting the increase in production. In fact as we have seen previously, the Russian economy is heavily dependent both on exports and imports, respectively on the foreign demand for oil and gas and on the foreign supply of technology, so as being highly prone to external shocks. This macroeconomic instability rebounds on the microeconomic environment, which is very fragile and can't pursue a medium-long run strategy of investments. This consequently plays as deterrent for a stable growth.

In the specific case of the manufacturing sector we have to underline that in addition to the lack of financial resources, ranked as third for importance¹⁰⁴, and to the uncertainty of the economic environment, ranked as second, the main factor restricting the increase in production is the insufficient demand for production in the domestic market.

These data show two possible related problems: the inconsistency of the purchasing power of the domestic demand, which doesn't own a nominal income big enough to afford huge expenditures in consumptions of goods, and a higher consumption propensity of the domestic demand towards the service sector, which benefits most from this consumers' behavior.

In addition, according to fig. 11 in the appendix, almost one enterprise on four in the manufacturing sector states that a rising issue is competitive imports. This even more emphasizes the effects of the Dutch Disease, which, apart from reducing the competitiveness of the manufacturing sector for the reasons previously explained, exacerbates the conflict between the local manufacturing sector and the foreign competitors.

3.5 Conclusion

The investigation here done has led us to verify if the theory defined by Corden and Neary is feasible for the Russian Case. According to the model described at point 4.1, it is assumed that there is no resources movement effect, cause of the oil sector employs a small part of the labor force and cause of the low labor mobility in the economy. So the only effect that works in our model is the spending effect¹⁰⁵. Based on this, theoretically the Russian economy should have faced four main consequences of the oil price boom:

¹⁰⁴ Respectively almost 45 % of the enterprises polled in the survey evaluate this factor as crucial, almost 47 % of the enterprises polled in the survey evaluate the second factor as crucial, almost 53 % of the enterprises polled in the survey evaluate this first factor as crucial.

¹⁰⁵ So If the spending effect tends to be stronger than the resource movement effect, like in this case, the result will be an increase in the service sector output and in a stronger real appreciation.

1. A real appreciation of the exchange rate caused by the relative increase in the prices of the service sector against those of the tradable sectors, which are exogenous.
2. A slow-down in the output of the manufacturing sector, an increase of the services' output and a likely increase in the output of the energy sector¹⁰⁶.
3. An increase of the employment of the service sector against a decrease of employment in the manufacturing sector.
4. An increase of the nominal wages, but a possible different effect on the real ones, depending on if the prices of services increase at a rate higher than that of nominal wages, and if the increase in oil price is partially absorbed by government's interventions.

According to table 12 which summarizes the symptoms emphasized by the previous analysis through points 4.2, 4.3 and 4.4, we can clearly understand the final result driven by the bull oil-price trend started in 2000, and by the resulting output and exports recovery of crude oil.

Looking at the last row of the table, we can see that the combination of the spending effect and the real appreciation effect, brings to five empiric evidences:

1. The Real Exchange rate has accelerated, passing from almost 41 Rubles/\$ in 2002 to 21 Rubles/\$ in 2010.
2. The price of services increased relative to the prices of manufacturing and energy sectors¹⁰⁷.
3. The manufacturing output grew slower than the energy sector from 1992 till 2010, and when the price of oil increased strongly, almost an annual average growth of 27 % between 2003 and 2006, the slow-down of the manufacturing sector became even more evident.

¹⁰⁶ The increase in price pushes up the production because there are more incentives to invest and exploit new oil fields which at the previously price were too much expensive, but conversely the increase in price reduce also the foreign demand that is almost rigid, which tries to substitute oil with new types of sources, now more convenient, while the internal demand which is subsidized by the government's intervention that controls the ceiling price to prevent an overheating of the economy, usually doesn't change. So at the end the output can increase or remain constant, but it is not likely to decrease.

¹⁰⁷ Even if, out of the model's criteria, the price of oil continued to grow.

4. The service sector benefited from the spending effect driven by the government and oil renters' new revenues, showing a good output performance.
5. The employment shifted from the manufacturing to the service sector, passing respectively from 17,2 % to 15,4 % and from 59,6 % to 62, 7 % between 2005 and 2010.
6. The level of nominal wages ranked the mining and quarrying sector producing energy as the main winner with an average of 46.300 Rubles per month, then the service sector with an average of 23.100 Rubles and the loser, the manufacturing sector with an average of 19.100 Rubles¹⁰⁸.
7. The FDI inflows direction toward the energy sector emphasizes the rising gap between the three sectors, in fact the rising productivity of the oil sector driven by sky-rocketing oil price increases even more this gap.

Table-12 Overview of the Dutch Disease Effects on the Russian Economy¹⁰⁹

Boom in Oil Price	Output	Employment	Nominal Wage	Price	FDI
Resource Movement effect					
Oil Sector	D or +	D or +	+	Exogenous	+
Manufacturing Sector	D -	D or -	+	s	/
Service Sector	D or -	D or -	+	Exogenous	/
				s	
				+	
Spending Effect					
Oil Sector	+	/	+	Exogenous	+
Manufacturing Sector	-	-	+	s	+
Services Sector	+	+	+	Exogenous	+
				s	
				+	
Real Appreciation Effect					
Oil sector	/	/	+	Exogenous	-
Manufacturing Sector	-	-	+	s	-
Service Sector	/	/	+	Exogenous	-
				s	
				+	

¹⁰⁸ In this value it is comprehended the manufacture of petroleum, which brings up the average of the sector.

¹⁰⁹ D= Denied; / = No change; + = Positive Effect; - = Negative Effect

Total Effect					
Oil Sector	+	/	+	Exogenous	++-
Manufacturing Sector	--	--	+	s	+-
Services Sector	+	+	+	Exogenous	+-
				s	
				+++	

However after having investigated the symptoms that appear in the Russian Economy, it is difficult to determine which mechanisms have played a crucial role in providing this result more than others.

This deep analysis about the symptoms of the Dutch Disease and about its related issues has led us to conclude that more than a threat, it is a real problem affecting the Russian economy, especially its manufacturing sector.

In addition to this conclusion we can state that the petroleum industry seems to be what everyone is searching for:

1. The Russian government cause of the huge tax and exports revenues.
2. The local investors, which look at the oil and gas rents as the easy way to get rich.
3. The foreign investors, which look at the oil and gas reserves as huge sources of gains.
4. The labor force, which aims at working for the petroleum industry to get a way out from the rising inequalities trap.
5. The foreign governments, which try to secure the oil and gas supply for the years ahead¹¹⁰.

¹¹⁰In 2010 the main investors in Russia throughout the FDI channel were United Kingdom with \$ 41 billion, Netherlands with \$ 11 billion and Germany with \$ 10 billion, all together accounted for almost 55 % of the total. As we have seen in chapter 3.2, they were the main importers of oil from Russia between 2009 and 2010.

Chapter 4

Rising Threats to Growth Sustainability

4.1 The Unstable and Unsafe Growth Path: a Possible Way Out

As we have been able to see till this point in the analysis, the manufacturing sector in Russia doesn't play an important role, and even more it is reducing its share of labor force, nominal wages, and output relative to the energy and service sectors.

In comparison with other emerging countries, like its BRIC's brothers, Russia is the one with the highest GDP per capita in PPP, almost 20.000 \$, against Brazil's 11.200 \$, China's 7.600 \$ and India's 3.600 \$ in 2010. According to the manufacturing value added as % of GDP, Russia shows a value of 16 %, compared to that of China of almost 30 %, Brazil 16 %, and 14 % India¹¹¹. But contrariwise to India and Brazil, the specialization in the service sector for Russia is not so natural, in fact it doesn't own neither the advantage of English as mother language like India, nor the relative safe business environment and relative quality of logistics and transportation infrastructures like Brazil¹¹².

Even more looking at China, the manufacturing sector is the most important GDP performer, and instead of showing a slow-down during its process of growth, it grew over the years. China showed a value added as % of GDP about 35 % as average between 1965 and 2011, 19 percentage points higher than the Russian one¹¹³.

If we look at the transformation of the Russian Economy in the last two decades, starting from the collapse of the soviet era, we can notice that the value added as % of GDP for the service sector passed from accounting 33 % in 1989 to accounting 59 % in 2010, conversely the value added of the industry sector passed from 50 % in 1989 to 36 % in 2010. This huge

¹¹¹ World Bank database 2012.

¹¹²Khanna T. and Palepu K. G., *Winning in Emerging Markets: a Road Map for Strategy and Execution*, Harvard Business Press, 2010, p. 32

¹¹³World Bank database 2012.

increase of the service sector was due to both the decrease of the industry and also of the agriculture sector, which in 1989 owned a value added as % of GDP around 17 %, but of only 4 % in 2010, a loss of 13 percentage points¹¹⁴.

According to these data, which confirmed the Krugman's hypothesis previously explained, the burden of economic growth has shifted from industry and agriculture to the service sector. The latter is carrying always more alone the growth weight, as well as the impacts and effects of external shocks. In fact according to Oomes and Kalcheva, with a small manufacturing sector, and almost voiding agriculture sector, and an energy sector with fixed labor force¹¹⁵, the service sector would result "the only employer, and all shocks will have to be absorbed by expenditure switching unemployment, implying increased volatility"¹¹⁶.

To better understand the unstable and unsustainable growth path that Russia started to pursue in 2000, it is useful to proceed by a comparison with the Chinese one, which is diametrically opposite.

China to pursue a growth rate of 10 % in the last 2 decades, adopted an economic model export-oriented, which is the only way to pursue a double digit growth. In fact if your saving rate is around 52 % as China has, conversely the consumption rate is very low so, reducing the demand for goods and services and at the end leading to a contraction in relative terms of the production side. This trap can be avoided only by exporting abroad the excess of production, compensating the low domestic consumption with the foreign one. This allows China to get access to huge financial resources so as being able to boost investments and future growth, as well as to continue to save without being afraid of a low domestic demand and output contraction.

¹¹⁴Ibidem.

¹¹⁵The mining and quarrying sector is considered to have fixed unemployment because it doesn't employ big part of the labor force, only 1,5 %, so during a positive or a negative shock, it is supposed being unchanged, as said previously the resource movement towards or opposite to the energy sector is denied.

¹¹⁶Oomes N. and Kalcheva K., Diagnosing Dutch Disease: Does Russia Have the Symptoms?, IMF Working Paper, April 2007, p. 10

However, this model also owns its limits, in fact it is vulnerable to external foreign demand shocks, and implies huge current account imbalances, which are translated into a constant accumulation of foreign reserves. In addition the possible crucial issue is related to the growing middle class and to the necessary and mandatory rise of the domestic demand's consumption, which will lead China to a drastic change in path.

This at the same time is making Chinese manufacturing sector acquiring a high level of competitiveness in technological products increasing the technological knowledge thanks to the learning by doing process and finally to lead to a path of sustainable and lasting increase in welfare¹¹⁷.

As well as China did, also Russia showed during the last decade a high growth rate around 7%, cumulatively the GDP grew between 1999 and 2008 about 69 %, which has offset the recession period happened between 1990 and 1998¹¹⁸. In addition, as shown before, Russia got a huge current account surplus 10 % on average between 1999 and 2008, and also a huge accumulation of foreign reserves, which passed from \$ 48 billion in 2002 to \$ 480 billion in 2010¹¹⁹. So if we look only at the numbers, the two export-oriented systems seem to be very similar, but they aren't.

The Russian oil-export oriented system creates the same macroeconomic effects of the manufacturing Chinese export-oriented system: strong current account surplus, foreign reserves accumulation, strong appreciations assuming no foreign market interventions¹²⁰.

¹¹⁷We have to mention that there are many other problems that affect the sustainability of growth of China, as the environmental degradation and increasing inequalities for example, but the rising learning process is the right way to achieve a sustainable growth. The ways by which China pursues this target are discussable, but according to a general accordance the final goal seems to be more positive than negative.

¹¹⁸The current level of cumulative growth taking as reference point 1990, the collapse of the Soviet Union, is + 14,5 % GDP growth.

¹¹⁹World Bank database.

¹²⁰Under this aspect, Chinese government implements a monetary policy still more tough than the Russian one to prevent any appreciation of the currency, the Yuan, so as avoiding a competitiveness' loss of the manufacturing exports.

But according to our analysis we have discovered that the macroeconomic effects of this model are very destabilizing for the microeconomic environments, leading to future permanent loss of the manufacturing sector, driving up social inequalities, and making the economy much more prone to external shocks, as oil price rises and falls.

In addition, the Russian model exacerbates these problems because it presents a high consumption and a low gross saving rate, respectively 69 % and 27%, the latter almost 25 points lower than the Chinese one in 2010¹²¹. This drives the focus on the real problem of the Russian system that is, without a high saving rate, an always lower FDI's inflows, and a not well-developed capital market, the small-medium enterprises and big corporations lack of the resources needed to invest in new projects and research and development. Therefore it is compulsory for Russia to maintain a continuous exports revenues in order to keep producing current account surplus and satisfying its need of capital for investments. However this is even more true for the oil and gas sector, in which huge amount of resources are necessary to develop and exploit new oil and gas fields, which are located in regions such as the East Siberian and far eastern provinces with geologic and geographical constraints.

According to this point of view, it will be really difficult to substitute the old oil wells of the Soviet era with new oil fields in Russia's far east. In fact it is likely that, when the oil reserves will finish and it is forecasted to happen within twenty years according to the current production and reserve ratio, then the actual level of consumptions will not be affordable anymore, so as to bring Russians to face another recession as in the 1990s.

This is quite evident to the eyes of the Russian government, in fact according to the government's Energy Strategy of 2009, the main goal is to reduce the energy sector's role at less than 20% of GDP and to increase the energy efficiency within 2030¹²². But as we well know, it is difficult to change drastically a growth path. In fact as said before, " like a river which digs its own bed deeper, a pattern of specialization - oil dependence -, once

¹²¹World Bank database 2012.

¹²²Strategy approved by the Russian government at 13.11.2009, <http://www.energystrategy.ru/>

established, will induce relative productivity changes which strengthen the forces preserving that pattern “¹²³.

According to this analysis a theoretic model can be used to explain what could be the possible effects on the Russian economy of the oil reserves depletion.

Assuming constant the reserves to production ratio at 20 years¹²⁴, so that in 2032 they will finish, we can hypothesize a possible future scenario of the Russian Economy.

However we have to say that this reserve to production ratio will be able to increase or to reduce, depending on two factors, one endogenous and one exogenous. Respectively it will depend on how much effort Russia will apply to change the situation, and if the external elements such as fluctuations in the oil price will help or threaten this process.

It is likely that the reserve to production ratio will remain constant or will decrease. This is due to the fact that there has been only a marginal exploration work during the period between 1992 and 2002¹²⁵. The main current oil fields in the West Siberia are “in the last stage of exploitation and in an irreversible decline”¹²⁶; these reserves in the last decade have diminished by 13 percent, and in all the Russian Federation by 17,5 percent¹²⁷.

Another relevant problem is the high costs that Russia has to face to exploit and transport oil from the new oil fields, the great majority of which is located in offshoring zone in the Arctic Sea of Siberia. The transport costs are really high cause of the geographical constraints, leading to profit margin contraction and huge fixed costs. Even more the closest market is the Asian one, and the most important for Russia, the European one, is much

¹²³Krugman P., The Narrow Moving Band, the Dutch Disease, and the Competitive Consequences of Mrs. Thatcher, *Journal of Development Economics* 27, 1987, p. 47

¹²⁴BP Statistical Review of World Energy, report 2011.

¹²⁵Dienes L., Observations on the problematic potential of Russian oil and the complexities of Siberia”, *Eurasian Geography and Economics*, 2004, No. 5, p. 324

¹²⁶Ibidem.

¹²⁷Ibidem.

more distant. In fact transporting the east Siberian oil to Europe is necessary to make huge investments in pipelines. These will reduce the profitability of the projects, and the volatility of the oil price, which leads to greater uncertainty for the costs recovery, and will discourage the pursuing of this investment plan. In addition the geological constraints, such as the temperature and the oil fields conformation, could delay the project bringing additional costs. In the end another crucial challenge for the replacement of the oil reserves is that the Russian oil companies have to face also high tax rate on oil exports, almost 90 % of the final price. This high taxation strongly discourages new investments by the oil companies, shrinking the profit margin, which is much lower than those experienced in the West Siberia's oil fields because these oil fields had bad geographic impediments but highly favorable geological features¹²⁸.

On the other hand the price also plays a crucial role for future investments and for the increase in production. We can say that with a high oil price around 100 \$/bbl the exploitation of new oil fields previously not profitable is now feasible, but on the other hand we have also to take into consideration that a high oil price makes the production of oil substitutes, as biofuels, nuclear power, coal, hydroelectricity, geothermal, solar, and wind much more convenient and affordable. As a last boundary, the Russian oil producing companies are lacking of financial resources and updated technologies necessary to exploit the Arctic oil, and possible aids from Western companies seem to be not so likely cause of the recent history concerning the lack of a property rights system¹²⁹. In fact this lack discourages the Western companies and at the same time the private Russian oil companies to invest in long term projects making them prefer the " creaming " technique, the short term view of profit maximization.

According to this, the state plays a major role leading to a higher level of rent seeking behaviors, corruption and technology's backwardness. In fact the state owned enterprises,

¹²⁸International Association for Energy Economics, IAEE Energy Forum First Quarter 2011, p. 20

¹²⁹As explained in the historical overview Western oil companies has been always attracted by the false promises on huge profits made by the Russian government, which, when the oil fields were exploited and the technology was acquired, drove out these companies, giving back only small shares of the contractual value of their work previously agreed.

not facing any relevant competition from private companies, are able to get profits also without using the technologies on the cutting edge - the horizontal drilling and enhanced recovery technology - so that ultimately this leads to inefficiency and higher level of reserves depletion.

However, we have also to say that with an upgrade of the exploitation technologies, an improvement of the refining process, a reduction of the domestic consumption, rising investments in research and developments, which will lead to new discoveries, the depletion process will run out at a slower rate, so as extending the length of time of the oil reserves.

So, if the process of diversification will not be implemented for the reasons that we have already seen - political and path dependence - the growth model will remain the same, always based on natural resources revenues. To avoid the trap of reserves depletion, the energy efficiency from both consumption and exploitation sides will be the only way out to avoid a possible future recession. In addition it is also desirable a reduction of the production rate, which, if it would be halved, will lead to a double up of the reserves to production ratio, increasing the length of time up to 40 years.

According to table 13, we can see that Russia is ranked as seventh for oil proven reserves¹³⁰ in 2010, owning almost 5,6 % of the total. But on the other hand Russia is ranked as first in the production of oil, almost 10.270 thousand barrels daily. The Russian scenario, not showing huge reserves, and the highest level of production, is not going to last forever.

Looking at the fourth column, reserves to production ratio¹³¹, we can notice that Russia has the lowest position between the major oil reserves countries, with a length of time about 20,6 years. This number compared with the other main owners is quite small, Venezuela, Kuwait and Iraq show a value higher than one hundred years, and United Arab Emirates,

¹³⁰BP definition: “ Generally taken to be those quantities that geological and engineering information indicates with reasonable certainty can be recovered in the future from known reservoirs under existing economic and operating conditions”.

¹³¹BP definition: “ If the reserves remaining at the end of any year are divided by the production in that year, the result is the length of time that those remaining reserves would last if production were to continue at that rate”.

Saudi Arabia and Iran show respectively, 94,1 years, 72,4 years and 88,4 years. All of them own a reserve to production ratio higher 4-5 times than the Russian one.

Even more if we look at the reserves per capita, that is the reserves weighted for the population, we can see that this ratio is still much lower relatively speaking compare to the previous one. Russia, in fact, with a population of 142 million has to satisfy energy demand much higher than that of the other major owners, so that the reserves depletion will result also in this case much quicker.

Table-13 Oil Reserves Ranking and Various Indicators

Country 2010	POR Tmb ¹³²	Total Share	R/P Ratio Years	Reserves Per Capita	Production Tbd	Oil Consumption Tbd
1) Saudi Arabia	264	19,1 %	72,4	9,6	10.007 (12 %)	2812 (3,1 %)
2) Venezuela	211	15,3 %	> 100	7,3	2.471 (3,2%)	765 (0,9 %)
3) Iran	137	9,9 %	88,4	1,85	4.245 (5,2 %)	1.799 (2,1 %)
4) Iraq	115	8,3 %	> 100	3,6	2.460 (3,1 %)	/
5) Kuwait	101	7,3%	> 100	37,4	2.508 (3,1 %)	413 (0,4 %)
6) UAE	97,8	7,1 %	94,1	7.5	2.849 (3,3 %)	682 (0,8 %)
7) Russia	77,4	5,6 %	20,6	0,54	10.270 (12,9 %)	3.199 (3,7 %)
11) US	30,9	2,2 %	11,3	0,1	7.513 (8,7 %)	19.148 (21,1 %)
13) China	14,8	1,1 %	9,9	0,01	4.071 (5,2 %)	9.057 (10,6 %)

Source: BP Statistical Review of World Energy, Report 2011

However as we have said, beyond the necessary efficiency improvement in exploitation and recovering techniques, which compared with the North Sea fields have a gap around 10 - 15 % of output recovery, Russia needs to decrease its level of consumption, which is one of the highest in the World relative to the size of the GDP. According to the International Association for Energy Economics, Russia consumes 2.5 times more than China and 9 times more than U.S.A relative to GDP.¹³³ This is due to three major factors respectively 45 % for the heavy energy-intensive industry of the previous Soviet era, 35 % for the long distances, and 20 % for the harsh climate and other factors¹³⁴.

¹³² Proven Oil Reserves, thousand million barrels.

¹³³ Solanko L., Why energy Efficiency is vitally important for Russia?, International Association for Energy Economics, 2011, p. 20

¹³⁴ Ibidem.

A possible energy saving strategy would be to pass simply to technologies existing in the Western World, and this saving is estimated to be around 45 % of Russia's total consumption, almost 15 % of the EU 27's total consumption¹³⁵.

So reducing the domestic energy consumption would be the fastest way to overcome the critical situation represented by the continuous depletion of oil reserves. This strategy would allow Russia to keep stable the export flows in the short term even if the reserves will be replaced only in the medium-long term. According to this Russia could be able to maintain its current level of growth and wealth in the short-term.

On the other hand, we have also to underline that, concerning oil exports, the main source of the Russian GDP, Russia used only 30 % of its oil output for domestic consumption, so that there are not so big margins to improve this consumption efficiency¹³⁶. It would be much more important to improve exploitation and recovery technologies to extract more barrels given a fixed quantity of oil so as to boost the exploitation efficiency. Also the refinery capacity should be enhanced because only 54 % of the output is refined in Russia, losing part of the profit margin¹³⁷. This is evident because the quality of the oil produced and so the relative price of Urals is much lower than the main brands such as WTI Blend from USA and Brent Blend from United Kingdom or the Arabia Light from Saudi Arabia.

However to really find a way out, we have to focus the attention on its natural gas reserves. According to table 14 we can see that Russia is ranked as first for natural gas proved reserves, owning almost a quarter of the World Total. In addition it has a production of 588 billion metric cubic, around 20 % of the World's natural gas production and it consumes around 13 % of the total, showing the second position only after the United States. This data is crucial because if we compare the quantity of gas consumed by Russia with USA and their relative GDP, we can see that Russia owns a much higher value, emphasizing its inefficiency. According to this, the natural gas reserves represent the key point for the future of the

¹³⁵Ibidem.

¹³⁶BP Statistical Review of World Energy, report 2011.

¹³⁷Ibidem.

Russian economy. It could be the turning point to compensate for a possible oil depletion so as to sustain the Russian growth path.

As we can see in table 14, Russia uses almost 70 % of its total gas production for the domestic consumption, exporting only a small part, almost 30 %. With these numbers, Russia succeeds in having a reserve to production ratio around 76 years, which thanks to the possible improvements in technologies, as previously explained, could be increased up to more than 100 years.

With an energy saving around 45 % - 50 % halving the domestic consumption, would lead, keeping fixed the output production, to a massive increase in the export flows. The possible scenario would be represented by a domestic energy consumption of gas around 35 % of the total production, and so a respectively 65 % for exports, completely reverting the current situation.

On the other hand, we have to say that the natural gas exports revenues are only one third of the oil export revenues so that a possible oil depletion will not be totally compensated by the scenario with the current level of gas production and the reduction of domestic consumption.

This underlines how an improvement of the energy efficiency will not be enough to maintain the current level of GDP growth, ultimately needing an increase in the future gas production.

Table-14 Gas Reserves Ranking and Various Indicators

Country 2010	PGR Tcm	Total Share	R/P Ratio Years	Reserves per Capita	Production Bcm	Consumption Bcm
1) Russia	44,8	23,9 %	76	0,30	588 (18,4 %)	414 (13 %)
2) Iran	29,6	15,8 %	> 100	0,40	138,5 (4,3 %)	136,9 (4,3 %)
3) Qatar	25,3	13,5 %	> 100		116,7 (3,6 %)	20,4 (0,6 %)
4) Saudi Arabia	8	4,3 %	95,5	0,29	83,9 (2,6 %)	83,9 (2,6%)

Source: BP Statistical Review of World Energy, Report 2011

After having emphasized the strategy and the tools to overcome a possible oil depletion, we have also to focus the attention on the main challenges that the Russian government will face to implement it.

The first problem is represented by the domestic energy pricing, which, maintained at very low level, impedes the rapid improvement in energy efficiency. The situation however is really tricky because if the Russian government will increase the domestic price of gas and energy, which is much lower than the export price, so as to decrease domestic consumption, ultimately it will reduce the implicit production subsidies that the Russian enterprises enjoy. This ultimately will harm the level of Russian companies' competitiveness, especially those in the manufacturing sector, exacerbating the effects of the Dutch disease. According to Tabata the Russian government subsidizes massively its industries charging lower domestic purchasers' prices than the world market average both for crude oil and natural gas¹³⁸.

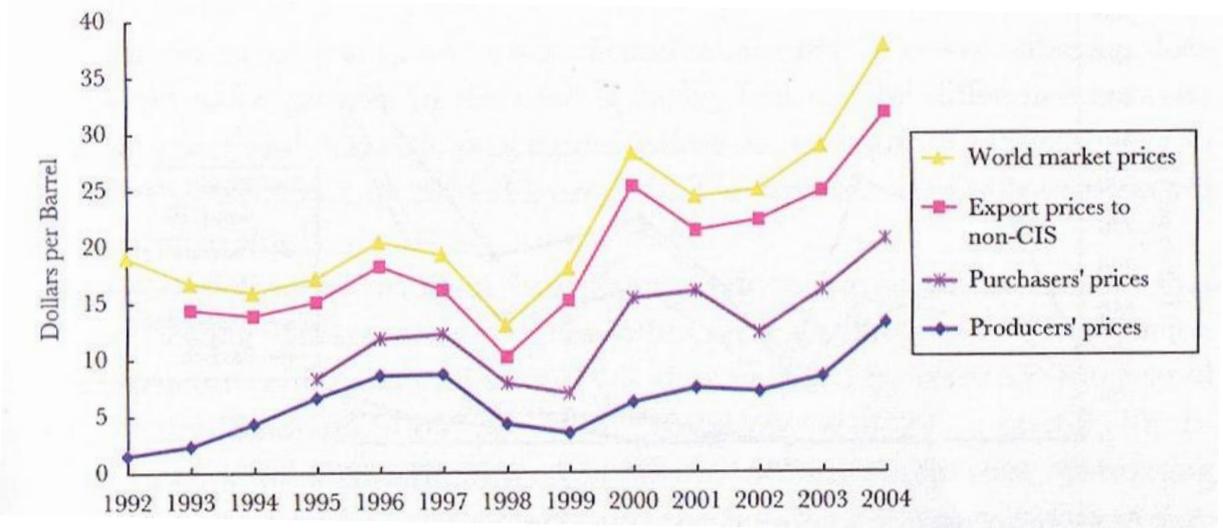
Looking at figure 20 we can see that between 1998 and 2004 the price gap between domestic purchasers' price and world market price for crude oil passed from 5.2 USD up to 17.2 USD.

Even more looking at figure 21 we can see that the price gap between domestic purchasers' prices and world market prices for 1,000 cubic meters of gas moved from 50 USD in 1999 up to 96.6 USD in 2004. At the end, the value concerning the total amount of gas and oil subsidies given to the Russian industry in 2004 was equal to 37.7 billion USD or 6.5 % of the Russian GDP¹³⁹.

¹³⁸Tabata S., *Russia's Oil and Natural Gas: price differences, taxes and the stabilization fund*, Anthem Press, 2006, p. 35

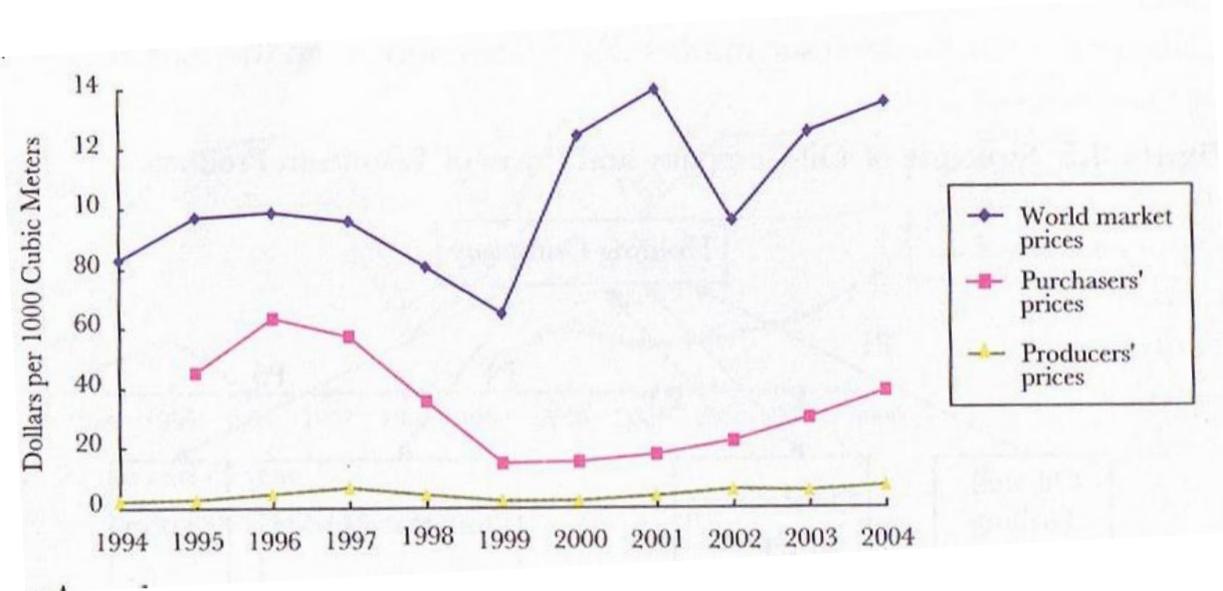
¹³⁹Ivi, p. 41

Fig. 20 Price of Crude Oil: price gap between domestic & world market price



Source: Russia’s Oil and Natural Gas, 2006, p. 37

Fig. 21 Price of Natural Gas: price gap between domestic & world market price



Source: Russia’s Oil and Natural Gas, 2006, p. 40

This strategy of keeping the energy price as low as possible is crucial for the industries in the manufacturing sector, which are mainly energy intensive. In fact without these massive state aids the negative effects of the Dutch Disease would be much tougher, leading to a faster and stronger process of de-industrialization, exacerbating the wages’ inequalities between sectors. If there wouldn’t be a domestic ceiling price, especially for natural gas for which the

domestic consumption accounts for 70 % of the total production compared to oil that accounts only for 30 %, the profits of the Russian energy companies would have been much higher leading to higher real wages in the energy sector. This consequently would produce not a shift of the labor force from the manufacturing to the energy sector - direct de-industrialization effect - , which we have seen previously being neglected, but a more conspicuous process of indirect de-industrialization from the manufacturing to the service sector which enjoys a fewer energy intensity and so higher profit margins.

The second challenge that Russia will have to face is the so called “ unconventional bonanza” of natural gas¹⁴⁰. In fact thanks to the recent technique called “ fracking “ developed in USA, since one decade it is possible to exploit shale gas. This type of gas is a source of methane like coal-bed gas in coal seams and tight gas trapped in rock formation. This innovation has created the world gas, putting under threat the Russian gas export revenues¹⁴¹. According to the MIT, these discoveries have brought the world year reserves ratio up to 200 years from only 60 years of a half a decade ago, doubling up the gas resource base¹⁴².

This said, however, the point to underline is that these discoveries, according to figure 22, have been done not in the countries leaders for gas reserves, but almost everywhere, such as USA, Europe, China, Argentina, Brazil, Mexico, Canada and many African countries. For example in USA, the first developer of this new source of energy, shale gas contributes to a third of the America’s gas supplies, and it is forecasted that in 2035 this share will increase up to 50 %¹⁴³. In the same way it is happening in China, which has the biggest potential in unconventional gas. In fact according to EIA’s estimates, China will be able to produce 475 bcm in 2035, of which 390 by unconventional when the current level of output was around 100 bmc in 2010.

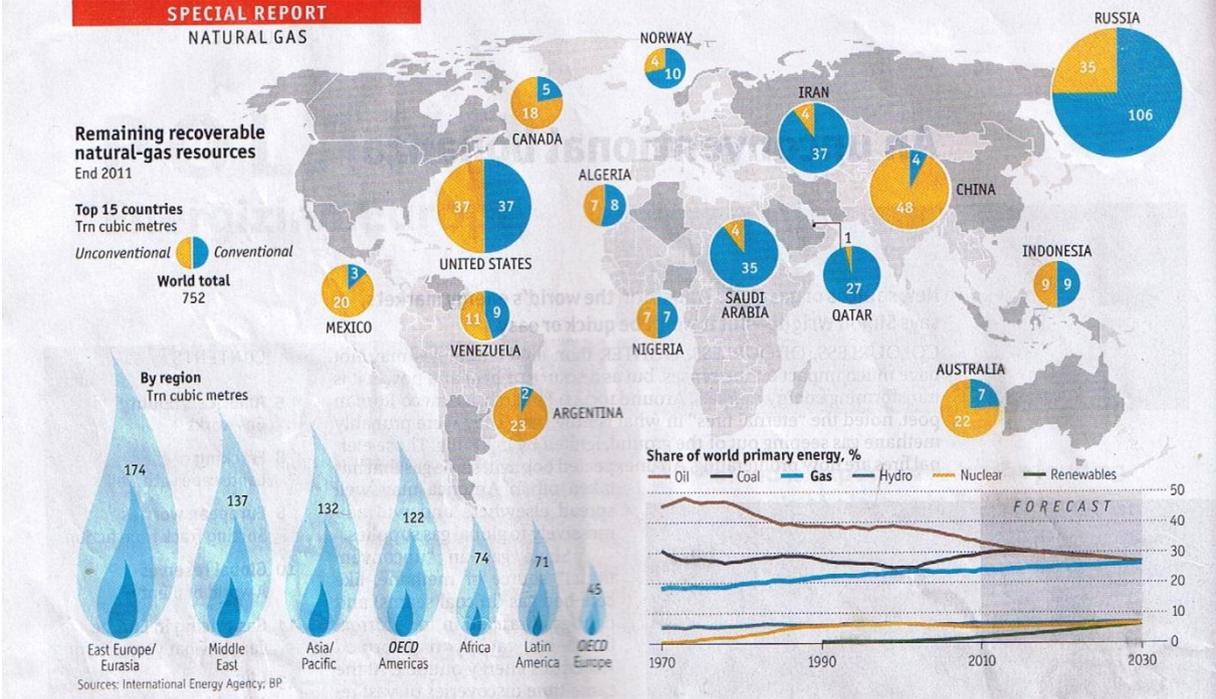
¹⁴⁰The Economist, “ Special Report: Natural gas “, 14th - 20th July 2012, p. 3

¹⁴¹Ibidem.

¹⁴²Ibidem.

¹⁴³Ivi., p. 5

Fig. 22 Conventional and Unconventional Natural Gas Resources in 2011



Source: The Economist, “ Special Report: Natural gas “, 14th - 20th July 2012, p. 4

This surge will have two drastic effects for Russia. The first is the reduction of the gas prices. An increased supply will decrease the price of gas, which consequently will lead to a contraction of the profit margin and the related export revenues of Russia. However we have to say that till the gas price will be oil indexed, the price will decrease much more slowly, but meanwhile with a growing global competition, the market is moving always more towards a global price.

In addition we have to say that gas is much more difficult and expensive to transport than oil, and this is also confirmed by the fact that globally two-third of oil output is exported compared to only one-third of natural gas. These higher costs for gas come from the need of building pipelines to link the seller to the buyer, which is possible only between connected countries, and because the other way to transport it would be by turning gas into a liquid by

cooling to -162°C also called LNG¹⁴⁴, that is really expensive as well as building up long pipelines¹⁴⁵.

The second problem is the possible reduction of the Russian exports always due to the diversification of the supply implemented by the gas importing countries. In fact given the discoveries of so many sources of unconventional natural gas, Europe as well as China and many other countries will not anymore rely exclusively on the exports of Russia, Iran, Iraq and Saudi Arabia - the major gas producing and owning countries - but they will diversify their supply between domestic production and new suppliers searching for the best price. Given these new market conditions, many European energy firms are already making pressure to Gazprom to renegotiate the long term contract signed for 20 or 30 years in the middle of the past decade¹⁴⁶. Even more China, which was dealing with Gazprom to build a pipeline to transport gas from the East Siberia has refused to sign, emphasizing the fact that the gas price contract was too high¹⁴⁷.

Ultimately this recent and rising trend has already produced huge price gaps between countries. For example in USA the cost of gas is 2.50 \$ per mBtu¹⁴⁸, when in Europe is touching 12 \$ per mBtu and in Asia is around 16 \$ per mBtu. This price differentials can create great incentive for the production and export of liquefied natural gas, LNG, which already accounts for almost 10 % of the total gas production. In addition, this would obviate to the problem of supplying countries even if they are not connected by pipelines so as to create a global unified spot-market for gas. In fact it is foreseen that the LNG production will

¹⁴⁴ Liquefied natural gas.

¹⁴⁵The Economist, " Special Report: Natural gas ", 14th - 20th July 2012, p. 3

¹⁴⁶Ivi., p. 12

¹⁴⁷Ivi., p. 15

¹⁴⁸British thermal units, BP Statistical Review of World Energy, Report 2011

double between 2011 and 2020, passing from 278 m tpa¹⁴⁹ to 526 thanks to its largest exporter, Qatar, which accounts for almost 27 % of the world exports.

To conclude we are able to affirm that:

If Russia would shape its destiny, keeping constant at high rate its level of economic growth in the short-medium term, it has to replace the oil revenues depletion with higher level of gas exports. To smooth this transition process, there are two possible ways: the increase in exploitation efficiency of oil to reduce the speed in which oil reserves are depleted and the decrease of the domestic gas consumption through the elimination of price subsidies, combined with an increase in gas production. In addition Russia will also need to reduce the price of gas in order to face more easily the rising competition, even if this will reduce its marginal revenues. However as we have seen this possible solution will be really difficult to implement cause of the trickiness of the energy market and the uncertainty concerning current global reserves, production and prices, always in change.

On the other hand we have seen that this strategy has also a negative side, it will exacerbate the effects of the Dutch disease going in the opposite direction of the Russian Energy Strategy planned in 2009, that is, to reduce the energy sector to less than 20 % of the Russian GDP. To keep on enjoying this economic growth and to maintain the achieved level of wealth, Russia has to continue in specializing in its relative comparative advantages, the natural resources. Contrary if Russia would try to change its pattern of specialization, by diversifying, it will need to pursue a long term strategy, accepting slower growth, but for a more stable and sustainable macroeconomic environment.

However this said, we have also to underline that the Russian government seems to pursue neither the first strategy nor the second. Even more, after the doubtful re-election of

¹⁴⁹Tons per annum, when the total world production in 2010 was 2858 tpa, BP Statistical Review of World Energy, Report 2011

president Vladimir Putin, the situation has worsened, making “ the natural resource curse” always more a real danger through higher level of corruption, black market, tax evasion and policy-paralysis. On the peak of the iceberg is the lack of property rights and the persistent state monopoly in the energy sector, which, playing a key role for the international powers games of Putin, will not be left to the rules free market. This is the reason why the energy sector will pursue none of the two possible ways out: exploitation efficiency and consumption reduction. The state, not aiming at enhancing companies’ competitiveness and free market behavior, and striving only for the country’s control and political power, is not implementing the necessary policies to bring a wind of change in the Russian economy, so as to avoid a possible economic crisis.

According to the previous analysis, now we will focus the attention on what could happen if Russia will keep on growing according to this growth model, without decreasing the dependency on natural resources and without implementing the necessary energy policies.

4.2 The Financial Crisis and Future Oil Reserves Depletion: a Possible Comparison

The Financial Crisis

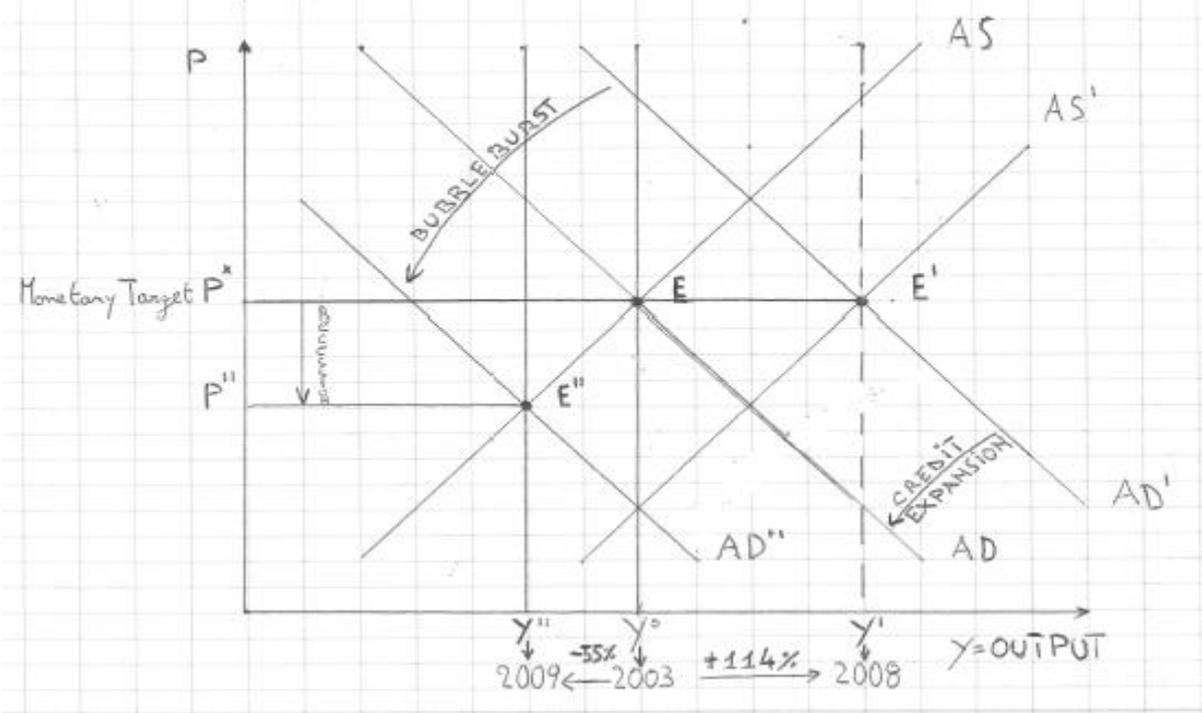
The Financial Crisis started in 2007 was a devastating force which led the Western economies and many emerging markets to plunge into a recession and face high level of unemployment. Russia in 2009 showed a GDP de-growth rate of -7,8 %, almost 13 percentage points differential lower than the previous year, when the other members of the BRIC faced only a small reduction of their growth rate. Even more it hasn’t recovered the GDP level pre-crisis yet, this makes us understand how much dangerous the external crisis are for the Russian economy, and looking at the internal ones, Russia needed one decade to recover from the collapse of the Soviet Union.

The shock provoked by the stock market bubble that crashed in 2008 was the effect of optimistic beliefs of investors and of excessive credit creation. This bubble kept on growing

for 6 years, and when it burst, created three years of recession worldwide. The effects of the financial crisis in the Russian economy will seem to appear much smaller and transitory if they are compared with those of an oil reserves depletion.

However to understand the mechanisms behind these crisis, we can start the analysis investigating the role of demand and supply shocks thorough a diagram AD-AS. The diagram in fig. 23 aims at explaining why the central banks didn't do anything to prevent the bubble even if they were aware of the excessive credit creation main cause of the financial crisis. On the other hand the diagram in fig. 25 aims at showing a possible scenario of an oil resources depletion in the Russian economy. Even if the two diagrams seem to be not so related, we will discover that a common ground of explanation could take place.

Fig. 23 The Supply Shock and the Financial Crisis



Source: Erik Pentecost, Course of Monetary Economics, Antwerp University, 2012

According to fig. 23 we can see that the bubble and its linked optimistic expectations are set in motion from point E (Equilibrium at time 2003). This leads to an increase of the stock prices and to a decrease of the cost of capital. This provokes the shifting of the aggregate

supply curve down, from AS to AS'. The rise of the assets value produces a temporary “wealth effect “, which together with the credit expansion makes the aggregate demand shift to the right, from AD to AD'.

According to fig. 24, this process has accumulated energy for almost six years, before let it go out, in fact the STOXX50 - Stock Price Index for the Euro-zone - showed an increase between 2003 and 2007 about 114%, a rise of 23 % per annum. Simultaneously, bank loans increased from less than 4% per annum in 2003 to double-digit growth rates in 2006-7, before collapsing in the financial crisis.

Fig. 24 Evolution of the Stock Price Index - STOXX 50 -



Source: Erik Pentecost, Course of Monetary Economics, Antwerp University, 2012

This data does suggest that the central banks were aware of the asset price and lending bubbles, but largely ignored them because of the inflation target.

The fact was that the monetary policy of the European Central Bank, oriented to fix the price stability at level P*, wasn't scared of the creation of this artificial assets' because the inflation target was still kept at the same level P* thanks to the shifts of both curves to the

new equilibrium E' as shown in the previous diagram. The target of the monetary policy wasn't in any jeopardy, and so the Central Bank didn't do any interventions.

As we can see in the diagram, the broken line passing for point E' states that the new output level is unsustainable and temporary because it derives from the credit creation mechanism and by the virtuous cycle of optimistic expectations. But when the bubble burst in 2008, cause of the excessive level of debt reached, both curves AD and AS shifted sharply to the left, but instead of keeping the initial level E, they overshoot the point, and jumped to point E'' , creating recession as well as financial and banking crisis. This overshooting created a loss of 55 % in STOXX-50 index in one year, bringing it back to the level of 2003.

This story has told us about the bounded inflation target of Central Banks, which were aware of the situation involved, the double-digit growth rate of bank loans between 2000 and 2007, but nothing has been done, the price stability was more important than preventing a crisis worldwide.

Oil Reserves Depletion

For the analysis of Russia, I will work in the opposite direction, it is based on the theory to predict possible effects, instead of explaining facts by a possible theory, so the work will be harder and maybe only suggestive this time. There are many things that can change during two decades, and no diagram can forecast something so far in time, but the theoretic explanation process can result very useful to realize how a dependence on a commodity as oil can turn into a curse.

Looking at fig. 25 we can see that the initial equilibrium, point E, is reached after the long recession lasted till 1998, the year of the Russian default. At Point E, the initial level of output is Y^o , the level of price is P^* , and the LM^o curve equilibrium is set in (M^o/P^*) , with r^* , the interest rate equilibrium.

According to what has been confuted in the previous chapters, the huge increase of oil prices as well as the oil output recovery carried out again the Russian economy since 2009.

This oil export recovery was the supply shock that shifted the Aggregate Supply curve to the right, from AS to AS'. In those years, between 1999 and 2008, Russia grew at a rate around 7 % on average, showing a cumulative growth of 69 %. Comparing the Russian economic growth with the fake one of the financial crisis, we can say that by all perspectives it was a real and not a temporary growth, so the line passing through point E' has not to be broken.

According to this rate of growth the economy would shift from point E to point E'p if and only if the Central Bank of Russia would have used a monetary policy oriented to price stability, that is adopting an accommodation-policy, whereas to point E'r if and only if the Central Bank would have pursued other types of targets more restrictive.

So after the shift of AS, an increase of Y, the level of output, happened, and it depended on the complementary shift of the aggregate demand curve, which depends as well on the monetary policy implemented by the Bank of Russia. The increase in output should lead to an appreciation of the nominal exchange rate, in fact it happened passing from 31,35 Rubles/\$ in 2002 to 24,85 Rubles/\$ in 2008¹⁵⁰. In addition the broad money annual growth rate was already high before 2001 around 56-58 %, and it remained constant between 2001 and 2005, floating between 33% and 38%, while in 2006 and 2007 around 40 %. Then in 2008 when there was the huge increase of oil price, the rate of broad money fell down sharply at 14 %, to prevent a strong increase of inflation, which however jumped to 14 % from 9% in 2007¹⁵¹. From here follows that in 2009 the broad money remained around 17 %, and in 2010 around 25%, much lower than the previous years. This is also explicable by the fact that the main target of Bank of Russia switched in 2008 from an exchange rate control and checking inflation to a pure price stability target¹⁵².

So we can state that an accommodating policy was implemented only partially, in fact the annual broad money grow rate remained constant for five years for then increasing moderately in 2006 by 4 percentage points, remaining constant in 2007, for finally falling

¹⁵⁰This has been investigated deeper in chapter 4.

¹⁵¹World Bank database 2012.

¹⁵²Referring to chapter 4 for a deeper explanation.

sharply in 2008. In fact the inflation rate decreased from the high level of 2000 almost 20 % to 9 % in 2007¹⁵³, just for this reason. According to this, we can see that the shift of the AD curve to the right was bounded so as not being free to reach the full level of output in $E'p$. In fact the money supply, instead of shifting from LM^o to $LM'(M1/P^*)$, passed to $LM'(M^o/P'r)$, as according to the data. This is the reason why the inflation rate halved between 2000 and 2007.

So in 2008 the increased level of output Y was less than its potential, passing from Y^o to $Y'r'$, instead to $Y'p$. The price level P^* went down to $P'r$ thanks to the new equilibrium AS' -AD due to the narrow shift of the LM curve caused by the only partial accommodating policy of the Bank of Russia, which decreased the interest rate from r^* to $r'r$ instead to $r'p$. The data confirm this trend, in fact the lending interest rate passed from 15,7 % in 2002 to 10 % in 2010, then increasing again in 2008 up to 12,2 % to avoid an undue inflationary pressure caused by the sky-rocketing oil price¹⁵⁴.

Contrary to Neary and Van Wijnbergen's analysis, already mentioned in chapter 4, in this case the increase in oil output didn't lead to a recession. They discovered that a contractionary shock, which leads to a recession, can happen if an accommodating policy is not implemented¹⁵⁵. We can explain the different result by the fact that the production increase wasn't temporary so that the increased and lasting welfare effect offset the possible contractionary shock, which wasn't " sufficiently great to offset the expansionary effects of oil discovery on domestic spending"¹⁵⁶. In addition the Bank of Russia increased, even if only partially, the broad money growth during the oil boom, so as reducing the effect of a contractionary shock.

¹⁵³However now thanks to this pure price stability target, the inflation seems to be kept under the double-digit value.

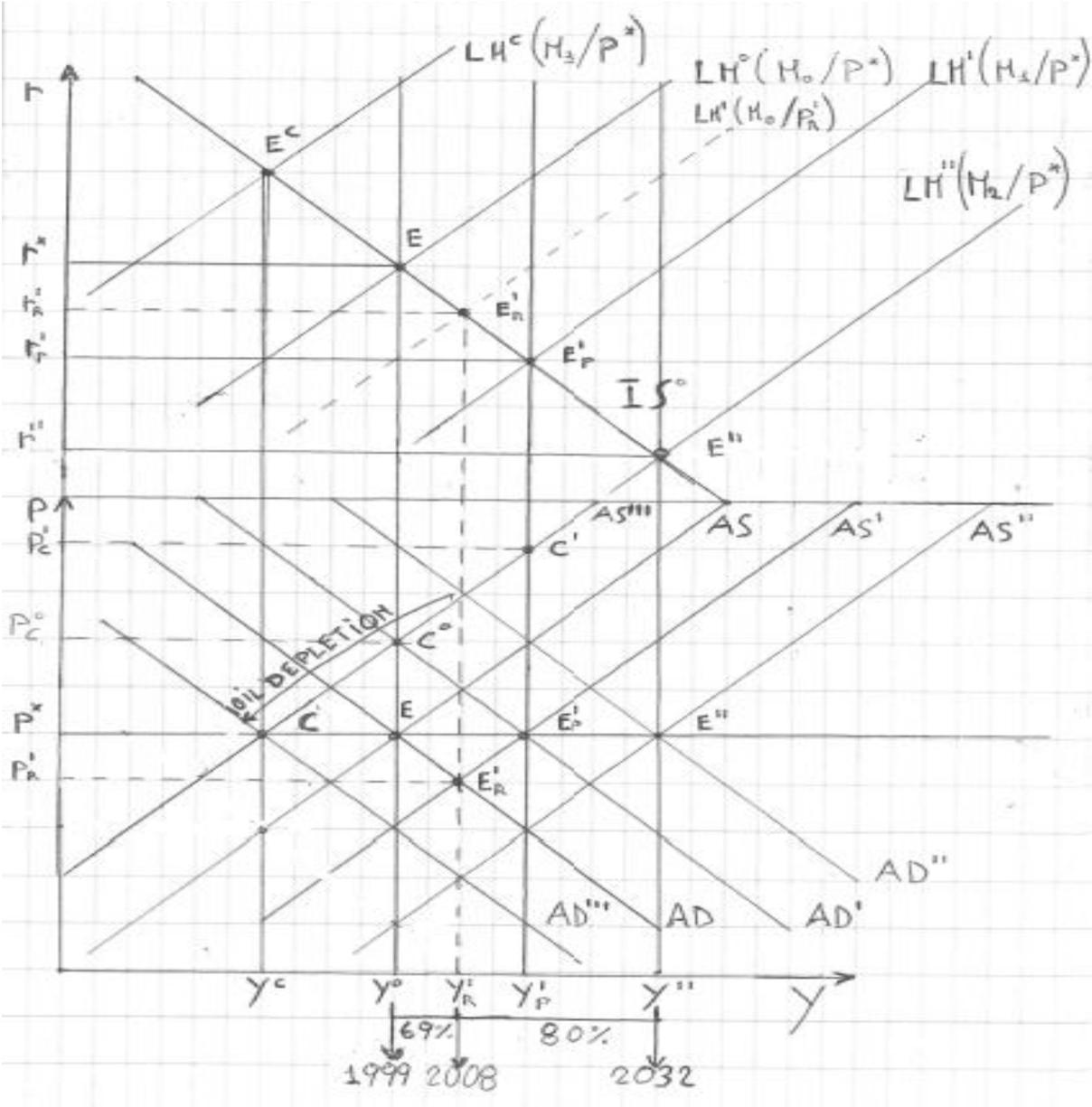
¹⁵⁴World Bank database 2012; we have to say that before 2002, the interest lending rate was quite high cause of the still unstable economic environment, which was just come out from the recession process. In fact the lending interest rate was 42 % in 1998, the year of default, 40 % in 1999, the first year of growth after the long recession, 24 % in 2000, and 18 % in 2001, till to stabilize around 15 % in 2002.

¹⁵⁵Neary J. P. and Van Wijnbergen S., Can Oil Discovery Lead to a Recession? A comment on Eastwood and Variables, *The Economic Journal*, June 1984, p. 394

¹⁵⁶*Ibidem*.

After having explained the process that led the Russian economy till nowadays, we can focus on the forecasting part, also the trickiest one.

Fig. 25 The Supply Shock: Russian Oil Depletion, a Possible Scenario



Assuming that the Russian economy levels off around 4% GDP growth rate according to the last years trend¹⁵⁷, and that the reserve to production ratio is 20 years, as the British

¹⁵⁷ It is also due to the end of the recovery growth rate, which lasted from 1999 till 2008, and compensated the de-growth rate that was experienced between 1990 and 1998.

Petroleum statistical review of world energy states, it can be theoretically foreseen a possible scenario in 2032, when the oil depletion will take place.

I would like to stress that this is only a theoretic scenario, in fact many factors, as explained previously can change during two decades, so that “ a river may dig its own bed, reinforcing the results of past history; but eventually the larger forces of tectonics will bury that history”¹⁵⁸. As we have seen, the crucial role in determining which growth path will pursue the Russian economy in the next decades, will be played by the government, which, as it created the energy super power, as well could create the conditions for another growth model, not based anymore on the natural resources comparative advantages¹⁵⁹.

So the economy is likely to shift from AS' to AS'' just like before thanks to the high level of oil production¹⁶⁰. Here the situation is not like previously out of whack, in fact the new equilibrium is set at point E'' , where the level of price P^* is in line with the price stability target established by the Bank of Russia in 2008. So there is going to be a progressive shift to the right of the aggregate demand, passing from AD to AD' to AD'' , thanks to the accommodating policy implemented by the Central Bank through the interest rate and credit channel to achieve the desirable price level P^* . So the money supply will have to increase, passing from $LM'(M^o/P'r)$ to $LM'(M'/P^*)$ for finally reaching the equilibrium level of $LM''(M''/P^*)$, where the interest lending rate to allow an expansion of credit passes from $r'r$ to r'' .

At this new point E'' , the equilibrium is set in Y'' and P^* , respectively a cumulative increase of welfare about 80 % in 20 years, according to the annual growth rate of 4 %, and a price level P^* fixed under double-digit level. But by now and for the years that are going to follow, the Russian economy will not be able to use its oil revenues to boost the economic growth,

¹⁵⁸Krugman P., The Narrow Moving band, The Dutch Disease, and the Competitive Consequences of Mrs. Thatcher, *Journal of Development Economics* 27, 1987, p. 54

¹⁵⁹For Russia these were the natural and easy course to come out from the recession.

¹⁶⁰It is assumed to remain higher than 10.000 tbd in the next two decades, however if it is going to be reduced, the reserve to production ratio will increase, as well as the length of time of the oil reserves.

which contributes, as previously investigated, for almost 20-25 % of the Russian annual GDP growth rate.

This will lead to a shift of the Aggregate supply curve from AS'' back to a level much lower than the previous AS position, cause of the overshooting effect. In fact this time, the economy will overshoot the previous equilibrium cause of the Dutch Disease phenomenon, which, with the passing of time, has strongly reduced the contribution of the manufacturing sector on the GDP formation. Contemporaneously the service sector alone will not be able to bear the impact of the shock, so that the new equilibrium of the Aggregate Supply curve is going to be set at AS''' .

The Aggregate Demand shift, as previously seen, depends on what monetary target the Central Bank is striving for, in fact it is likely to have three possible equilibriums.

The most likely scenario, according to monetary policy of the Central Bank, which in 2008 started to pursue a pure price stability, is that the level of price P^* will be kept constant. According to this, the money supply has to contract, passing from $LM''(M''/p^*)$ to $LMc(M'''/p^*)$, reaching the new equilibrium at point C. This monetary target brings the economy to a still more tough recession, which is represented by the passage from Y'' to Y_c . So in this case the Bank of Russia to follow a bounded inflation target, is going to push the economy into a deep recession, like explained in the previous model of the Financial Crisis .

However, if the Central Bank chooses to modify the target allowing the inflation to rise, there could be other two possible equilibrium points, respectively depending on the level of the money supply put in circulation, that is at which level the inflation will be let to float.

To achieve the former solution, that is the equilibrium at point C' , the Central bank should reduce the level of money supply from $LM''(M''/P^*)$ to $LM'(M'/P^* \text{ or } P'c)$, a small reduction, which will lead the economy to a level of price $P'c$, much higher than the previous one, provoking a strong double digit inflationary pressure on the economy. In this case the economy will show a contraction of the welfare not so devastating as the previous case, passing from Y'' to $Y'p$. In this case the bank has opted to achieve as main goal an

equilibrium which pays attention on the level of output and unemployment - output solution - but not on the inflation level.

To reach the compromise point C° , that is a stronger contraction of the welfare, (however lower than the level of output achieved by the inflation targeting case, the first case), but not a so big deviation from the inflation target, the money supply has to be reduced from $LM''(M''/P^*)$ to $LM^\circ(M^\circ/P^*$ or $P^\circ c)$. This will lead the economy to a right compromise between the price stability target and the output solution, which represent, respectively the main target of the Central Bank, and the solution for the highest level of aggregate demand after the oil depletion¹⁶¹.

However, considering the compromise point as unreachable for the reason previously explained in note, the possible scenarios that Russia is going to face after the oil depletion are two, both equally devastating. In fact the trade-off is between or a huge loss of welfare, the resetting of the improvements gained in the last two decades, or a strong inflationary pressure, almost close to hyperinflation or strong double-digit, which will reset all the savings, and will bring the economy to a strong slow-down. Both these possible foresights are catastrophic, and doesn't matter whatever the final scenario is going to take place, because for Russia will be equally devastating.

By this models' comparison, we have seen how a long term scenario, as twenty years of growth, which seemed to be real and lasting, can turn into a temporary and fake one, as that experienced during the Financial Crisis of 2008. As the credit creation boosted the stock market bubble, giving the illusion of an increase in the total welfare, as well the oil export revenues have given to Russians the sense to have achieved an higher level of richness, which will turn out to be an illusion.

¹⁶¹ We have to say that the compromise target, point C° , can be reached only if the slope of the aggregate demand is known. Without knowing the elasticity of the AD it is impossible to target the compromise point, so ending to opt for the inflation target or as second option for the nominal income target.

As we have seen in the previous paragraph, the Russian government has lot of tools that can be used, both to change its possible destiny up here described, and to offset a great part of its negative effects, or at least to shift them farer in time.

Summary & Conclusion

An Illusory Wealth

In this work I have analyzed the biunique relationship existing between the Russian Federation and its natural resources, focusing on oil and gas. These two sources of energy have shaped the destiny of this nation since the beginning of the XX century as well as its government has taken advantage of them to pursue its economic and political interests.

As we have seen the production of crude oil and its exports have been and they are what have made Russia an energy superpower, and a growing economic one. The last step of this process began in 1999, thanks to its president Vladimir Putin, who succeeded in re-unifying the energy industry under the state control, so as to make Russia recover from the deep recession faced after the USSR's collapse.

This new path has brought the country to grow at an average rate of 7 % for a decade till 2009, when the financial crisis and the oil price collapse brought back Russians to face reality. The double digit growth rate touched in 2000 and 2003 turned into a far memory when it reached - 7.8 % in 2009, a change of 14 percentage points in absolute value compared with the previous year. The first cracks of this growth model started to show up and to be clear to those who thought that the specialization in natural resources could have been the quick and easy way to wealth and richness. The government and its heads had ignored or undervalued the dangers in pursuing this path, or even worse, sacrificed the wealth of many, spreading inequalities everywhere, to enrich few oligarchs loyal to the state.

After the last crisis the growth rate is still much lower than its previous trend, having shown 4 % of growth in 2010 and 2011 and with a forecast for 2012 of 3.8 percentage points¹⁶². Even worse with an oil price lower than 100 \$ per barrel, the budget balance is forecasted to

¹⁶²The Economist, "Economic and Financial Indicators", August 18th, 2012, p. 72

be negative in 2012(almost -0.8%), and it is the first time because during the last decade has been always positive¹⁶³. This puts pressure to the government which, after the re-election of Vladimir Putin, is no more well seen by people that pushes towards a democracy with more rights and less corruption.

In such negative economic climate the Russian government has to face the effects of a growing Dutch Disease, which has been able to grow inexorably and strengthen its roots in the country and in the economic system. The macroeconomic disequilibria produced by this phenomenon has been underlined in chapter 4, emphasizing the impossibility on coming back on track if the effects last for a long period, leading to a permanent loss in the level of the Russian manufacturing competitiveness.

As we have seen the output growth of the manufacturing sector started to decline compare to the energy sector and service sector in 2001. Even more the production index for the specific sectors “ mining and quarrying of energy “ and “ manufacture of machinery and equipment “ that had a gap of only 10 points in 1992, in 2010 reached the level of 73 points. The level of employment decreased in the manufacturing sector of 1 million between 2005 and 2010, while the service sector’s employment increased about 2.5 million. Also the level of wages emphasizes the same trend, in fact an average wage in the mining and quarrying sector is two times higher than one in the manufacturing sector, respectively 39.800 Rubles and 19.100 Rubles in 2010. About the service sector, its average wage has grown faster than the manufacturing sector since 1995, and the latter is the only sector with an average wage lower than the economy’s average.

This underlines how the structure of the Russian economy has been built to favor the energy industry instead of the manufacturing one. This strategy has strengthened the comparative advantage that Russia enjoyed in natural resources, so as to reduce the return on investment in the manufacturing sector, which has had to struggle also with the constant appreciation of the exchange rate. This, in the end, has produced the so called de-

¹⁶³Ibidem.

industrialization process, which has transformed Russia into a service-based economy. The problem resulting from this is that, when a shock happens, the economy is no more able to soften its effects, so, to absorb the shock, it is necessary a higher government's expenditure or switching to a higher level of unemployment, producing instability and volatility in the country.

This process is clearly visible analyzing the composition of the Russian GDP and its balance of trade as it has been investigated in chapter 2. The exports revenues of the energy industry in the Russian economy keeps on growing and now counts almost 20-25 % of its GDP, contrary the manufacturing sector keeps on decreasing till reaching 4.8 % in 2010. Even more the fuel exports as % of the merchandise trade have passed from counting 43 % in 1996 to 64 % in 2010, and on the other hand the manufactures exports decreased from 26 % to 14 %. At the same time also the composition of imports changed, in fact the imports of manufacturing products increased, passing from 45 % to 69 % in 2010, showing a peak before the financial crisis of 79 %.

Thanks to this data, we can understand that the economic wealth gained by the oil and gas exports is spent to import those goods that are not produced in the country, almost the whole range of technologic products and luxury goods. Through the analysis concerning the trade with EU-27 we have appreciated that almost 94 % of European imports from Russia comprehend mineral products, stating that in the other sectors of the economy Russia doesn't enjoy any comparative advantages. On the other hand almost 60 % of the European goods exported to Russia is constituted by machineries, chemical products and vehicles, emphasizing that the Russian production in these sectors is backward and doesn't satisfy the domestic demand and its growing purchasing power.

The core of the Russian problem is that the concept of richness has changed since the first industrial revolution. Now the focus is put on who owns the technical knowledge to produce

the goods, and not on who owns the goods¹⁶⁴. Furthermore there is an additional issue i.e. the Russian growth's model " export to import " is unsustainable in the long run because the oil depletion is close and its replacement with natural gas is highly difficult as we have seen in chapter 5. Therefore this model ends to enrich only the owners of this knowledge, not the buyers of these products so that this level of wealth can be affordable only in the short run, making this bonanza only temporary and illusory.

The economic policy pursued in 2000 has only brought Russia to postpone the problems, which will turn up still harder cause of the void of the manufacturing sector. Instead of sustaining the manufacturing sector with investments boosted with the oil revenues and building up an environment more prone to innovation and business, the basis for the technical development and sustainable growth, the Russian government has pursued the opposite path. The Kremlin has, for more than one decade, dismantled the core of its industry, specializing totally in the production for which it enjoys a comparative advantage, the natural resources. This has been a fatal error because the comparative advantages are in continuous change so that a reduction of the oil price under a certain threshold, or a reduction of the global demand for this commodity, will lead to drastic change in the growth sustainability of the Russian economy¹⁶⁵. Tying its own destiny to a commodity so volatile such as the crude oil is, without any possibility of managing its price, which is exogenous, has been a really risky move.

All these structural features concerning the Russian growth path are typically symptoms that can be interpreted as specific schemes in the Dutch Disease theory as we have discussed in chapter 3.1.

This analysis is strengthened if we move from the disequilibria of the real economy to the financial sector which, as we have seen in chapter 3.2, are strongly interconnected. In fact investigating the fluctuations of the oil price and the monetary policy of the Bank of Russia

¹⁶⁴Pasinetti L., *Structural Change and Economics Growth: a theoretical essay on the dynamics of the wealth of nations*, Cambridge University Press, 1981, p. 314

¹⁶⁵Ivi., p. 312

we have discovered a positive correlation between the price of the Urals Crude and the appreciation/depreciation of the currency. This has been the proof that the Ruble behave as, and therefore is, a commodity currency. These two effects, real and monetary, which are the spending effect and the indexed currency to the oil price lead to an overheating of the exchange rate, so as producing the de-industrialization process by the indirect channel.

After that Russia has contracted the Dutch Disease and has manifested all its weaknesses to external shocks as the financial crisis demonstrated, the Russian government has realized that neglecting manufacturing has been a mistake. According to this, Putin recently affirmed that thanks to his factory-friendly policies will create 25 million skilled jobs and will build the first Russian Silicon Valley, Skolkovo, a high tech cluster out of Moscow¹⁶⁶.

This new path seems however an utopia. As we have seen during this analysis the crucial factor making the Dutch Disease such a negative phenomenon is that the de-industrialization process is not reversible. After more than one decade the symptoms have become chronic. The learning curves have been lost, and even worse the economic framework necessary to the manufacturing sector to develop and flourish has fallen into a doze. The entrepreneurial culture is still alive, but the business environment has not changed in these years, keeps on promoting red tapes and corruption. Thanks to these intrinsic and chronic features of the Russian business environment the western companies are always less involved and prone to invest in Russia so that the velocity in which the mobility of technical knowledge, the real richness, moves from West to East is still slow.

In the end, the Russia's entry in the World Trade Organization, which will happen in September 2012 and will be implemented within 2018 is going to be more a curse than a blessing. In fact Russia will have to phase out most of its trade barriers, but not those covering the energy industry, which are not ruled by WTO rules. Given this, the situation concerning the oil and gas exports will remain the same, only the manufacturing sectors will have to adapt. The problem here arises, in fact without any protection and cause of the

¹⁶⁶The Economists, " A change to get down to business ", 20th July 2012, p. 10

technological backwardness of its domestic industries, the Russian manufacturing sector will have to face the competition of the world's best. This easily will lead to a crash of the weak Russian manufacturing sector, which will not be able, after a lasting Dutch Disease, to bear the impact of the rules of free and fair trade.

So we can conclude that the Russian development model, basing on our analysis, shows clearly all the symptoms of the so called Dutch Disease. But there is an additional theoretical reference scheme that may be useful to interpret the growth path undertaken by Russia. We are dealing with that theory concerning the international trade called "Vent for surplus". This famous theory conceptualized by Adam Smith and later on revised by Hla Myint in the 1960s remarks that a country specialized in a specific sector - natural resources -with the goal of exporting its excess of production capacity is vulnerable to any type of external shocks¹⁶⁷.

In addition a corollary of this theory states that in the short run only few people benefit from the exports revenues. In fact as we have seen in Russia the regional inequalities and the Gini coefficient kept on increasing since 2002, going to favor only the oligarchs and a small part of all the labor force, the workers in the energy sector. Even more in the long run the corollary also affirms that the export-oriented specialization may create a situation of enclave in the economy, so as impeding the structural transformation of the economic system towards a more diversified and sustainable growth. In the end Myint suggests that to offset the negative effects of this one-way strategy, i.e. the continuous specialization in only one sector of the economy, it is mandatory protecting the domestic industry from the low costs of the foreign competition by implementing import duties and an import substitution policy. But we have seen that the Russian government has acted in the opposite direction, signing the entry in the WTO condemning its manufacturing sector to face even more harsh times.

¹⁶⁷Myint H., " The classical theory of international trade and underdeveloped countries ", Economic Journal 68, 1968

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Appendix

Table-1: Sub-Categories of Mineral Products: Russian Exports to EU-27

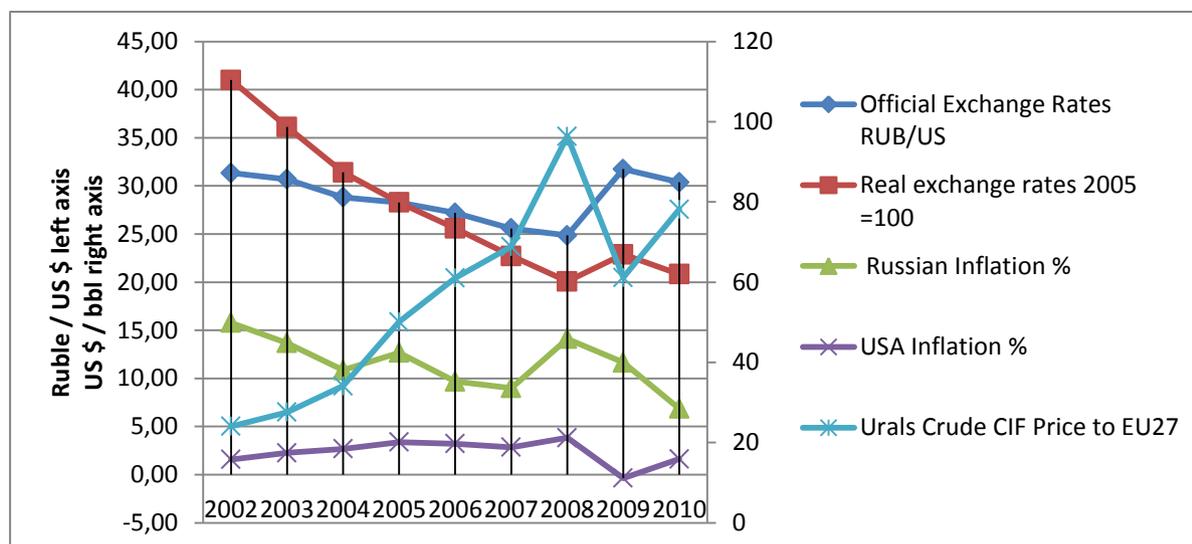
Product 27: Mineral fuels, mineral, oil and products from its distillation, bituminous substances, mineral waxes.

Sub-Categories		2009	2010	% 2009	%2010
2701	Coal, Briquettes, and similar products form coal.	3.528.750,40	3.609.786,25	4,13 %	3,05 %
2702	Lignite	9.229,84	10.396,64	0,01 %	0,01 %
2703	Peat	2.429,00	3.833,74	0 %	0 %
2704	Coke, and semi-coke from coal, of peat, of lignite.	27.908,79	82.549,35	0,03 %	0,07 %
2705	Coal gas, water gas, lean gas (excl. Hydrocarbon)	0	0	0 %	0 %
2706	Tar distilled from coal, from lignite and from peat.	0	0	0 %	0 %
2707	Oils and other products from the distillation of high temperature coal tar.	16.534,98	54.893,10	0,02 %	0,05 %
2708	Pitch and pitch coke obtained from coal tar or from other mineral tars.	0	0	0 %	0 %
2709	Petroleum oils and oils obtained from bituminous minerals, CRUDE.	52.491.198,12	77.406.240,74	61,4%	65,41 %
2710	Petroleum oils and oils obtained from bituminous minerals. ¹⁶⁸	15.893.103,83	22.949464,37	18,6 %	19,39 %
2711	Petroleum gas and other gaseous hydrocarbons	13.065.653,17	13.400.366,44	15,3 %	11,32 %
2712	Petroleum jelly, paraffin wax, micro-crystalline petro-wax etc.	79.608,83	96.496,28	0,09 %	0,08 %
2713	Petroleum coke, petroleum bitumen and other residues of petroleum oil.	28.543,60	39.397,69	0,03 %	0,03 %
2714	Bitumen and asphalt, natural; Bituminous of oil shale and tar sands.	231,61	0	0 %	0 %
2715	Bituminous mastics ,cut-backs and other bituminous mixture based on natural asphalt & bitumen etc.	376,94	583,91	0 %	0 %
2716	Electrical energy	400.104,65	692.622,18	0,47 %	0,59 %
TOT Product 27	Mineral products	85.543.673	118.347.170	100 %	100 %

Source: Eurostat database

¹⁶⁸ Preparation contains 70 % by weights of petroleum oils or of bituminous minerals.

Fig. 1 Nominal and Real Exchange Rate, Russian and American Inflation



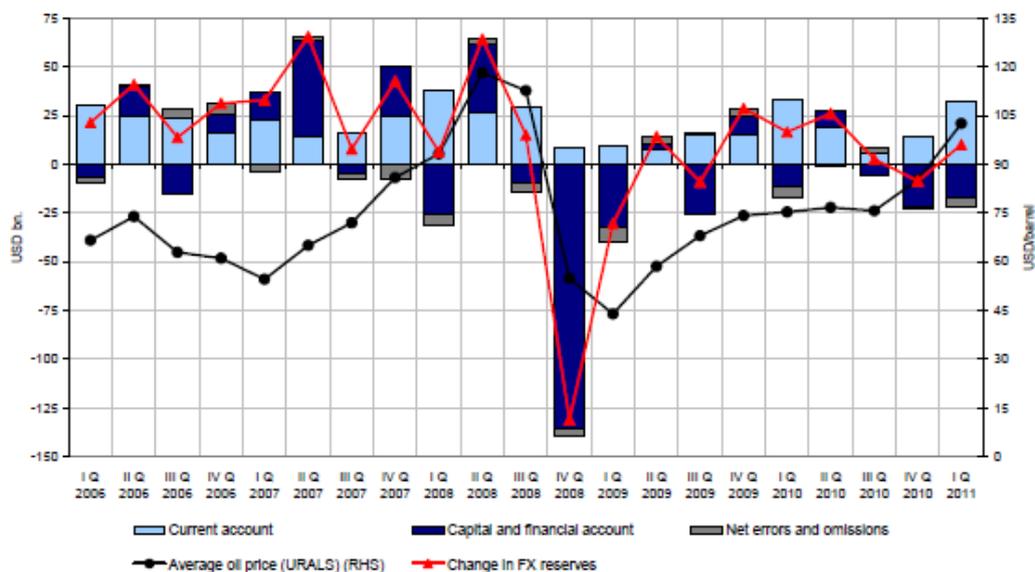
Source: World Bank database

Table-2 Big Mac Index: Under Evaluation of the Ruble against the Dollar %

Year	Big Mac Price USA \$	Big Mac Price Russia \$ & Ruble	Implied PPP of the Dollar	Actual Dollar Exchange Rate	Under/Over Evaluation against the Dollar %
2002	2,49 \$	1,25 \$ or 39 Ruble	31,2	15,7	-49,7 %
2003	2,71 \$	1,31 \$ or 41 Ruble	31,1	15,1	-51,5 %
2004	2,90 \$	1,45 \$ or 42 Ruble	29	14,5	- 50 %
2005	3,06 \$	1,48 \$ or 42 Ruble	28,3	13,7	-52 %
2006	3,10 \$	1,77 \$ or 48 Ruble	27,1	15,5	- 42,8 %
2007	3,41 \$	2,03 \$ or 52 Ruble	25,6	15,2	- 41 %
2008	3,57 \$	2,54 \$ or 59 Ruble	23,2	16,5	- 29 %
2009	3,54 \$	1,73 \$ or 62 Ruble	35,7	17,5	-51 %
2010	3,73 \$	2,33 \$ or 71 Ruble	30,4	19	-38 %
2011	4,07 \$	3\$ or 75 Ruble	25	18,5	-26 %
2012	4,20 \$	2,55 \$ or 81 Ruble	31,8	19,30	-39 %

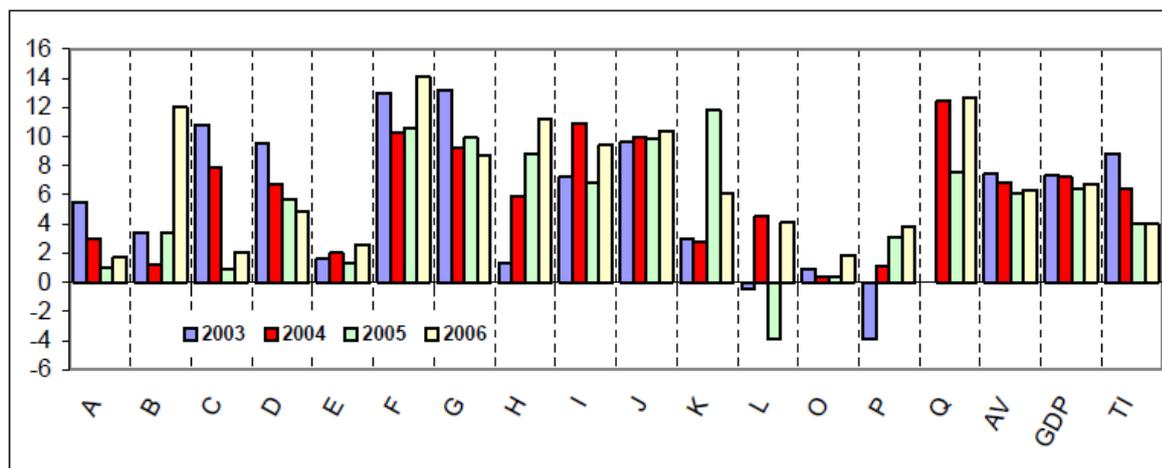
Source: The Economist database, 2012

Fig. 2 Structure of the Balance of Payments and Oil Price Dynamics



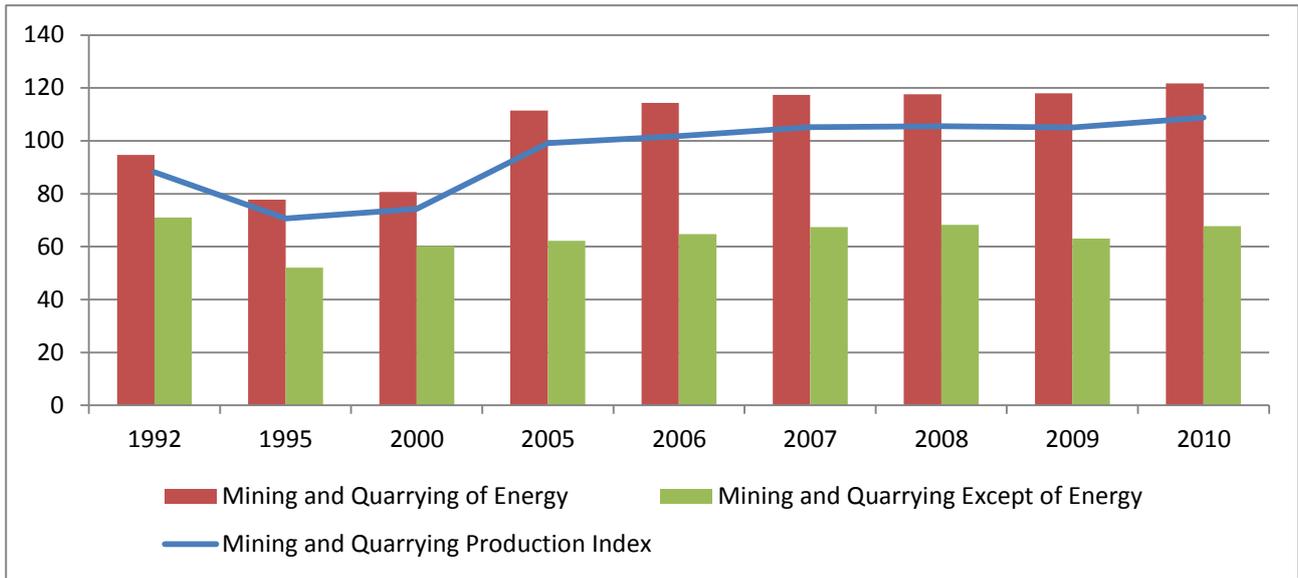
Source: BIS Paper No. 57

Fig. 3 Output Development by Economic Activities 2003-2006



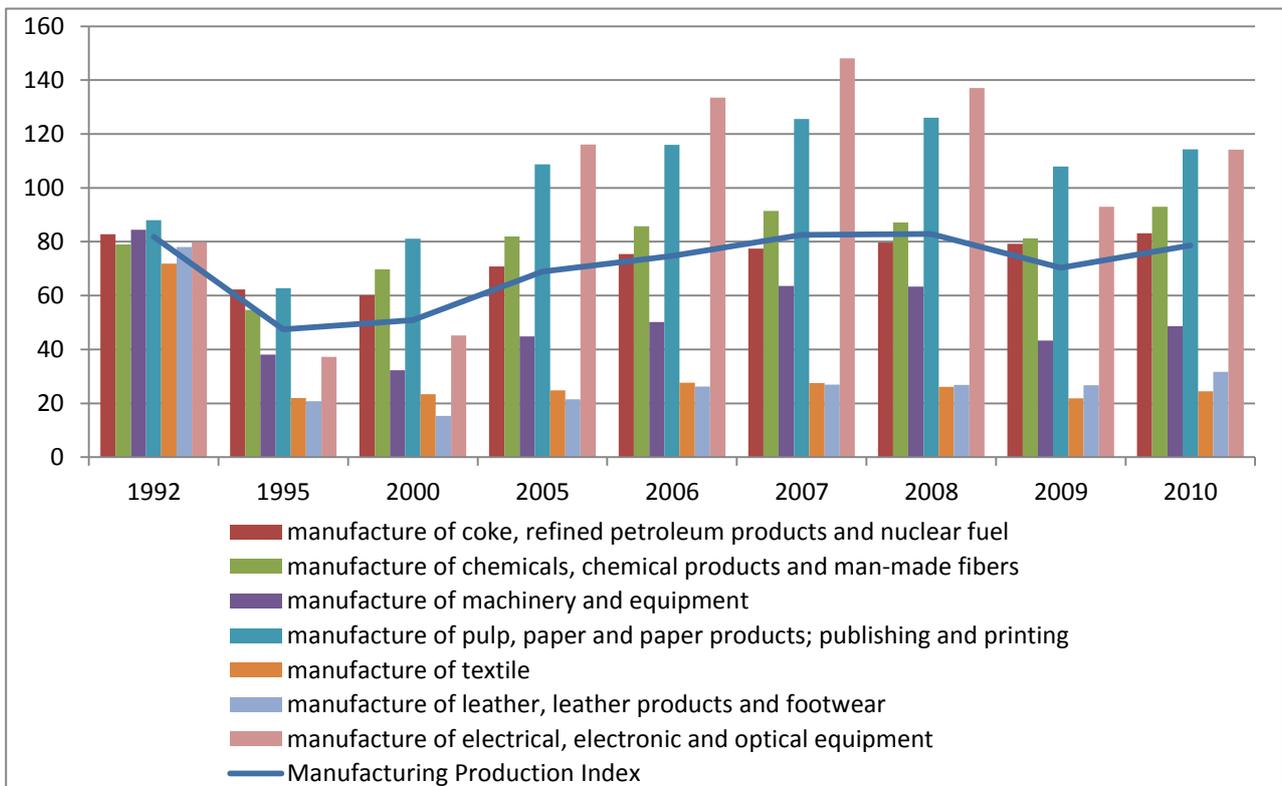
Source: WIIW, Federal State Statistics Service (A-B Agriculture, hunting, forestry and fishing; C-F industry; G-Q services, AV added value, TI total industry)

Fig. 4 Production Index for Mining and Quarrying with or except Energy 1991=100



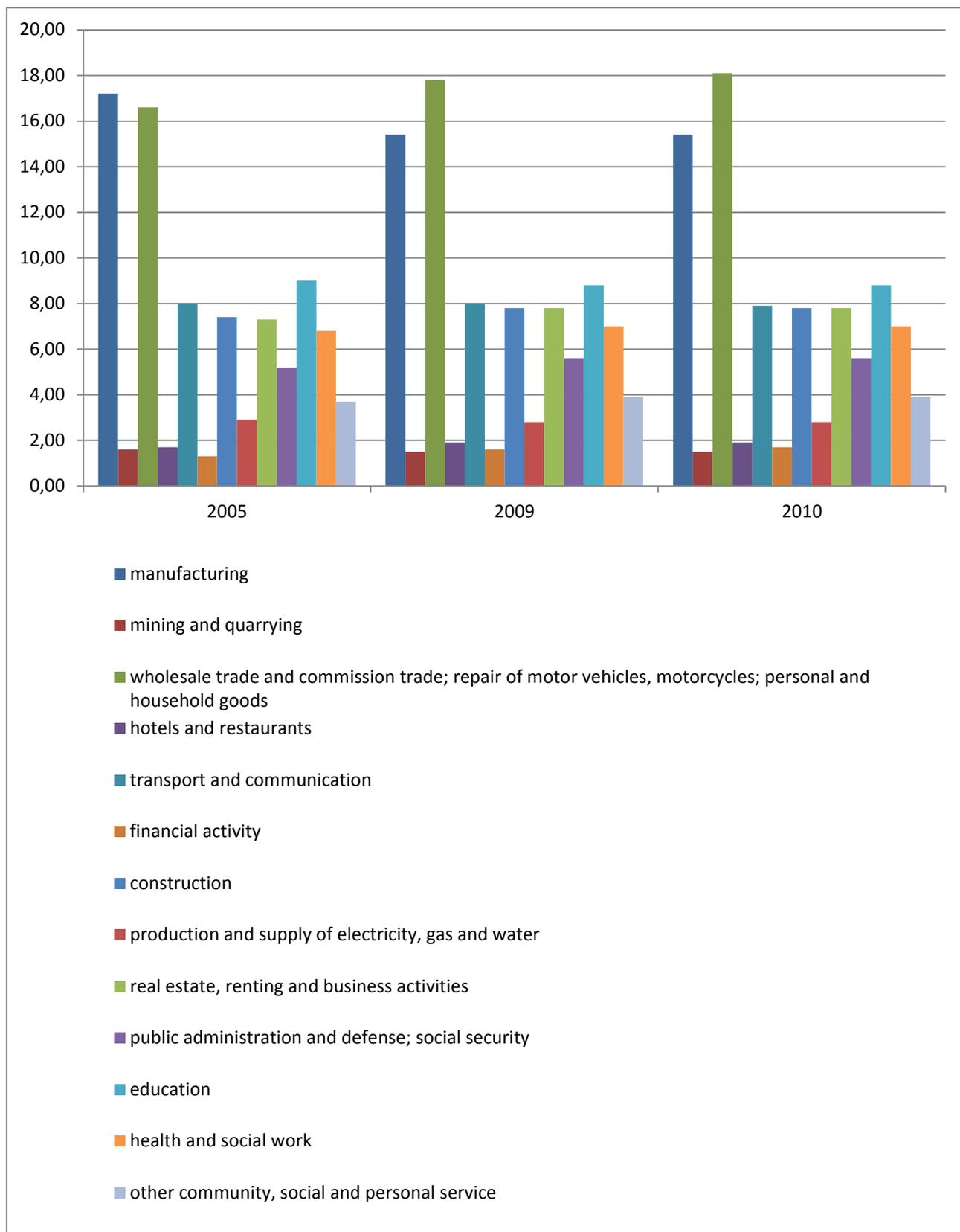
Source: Federal State Statistics Service

Fig. 5 Production Index by Main Manufacturing Sub-Categories



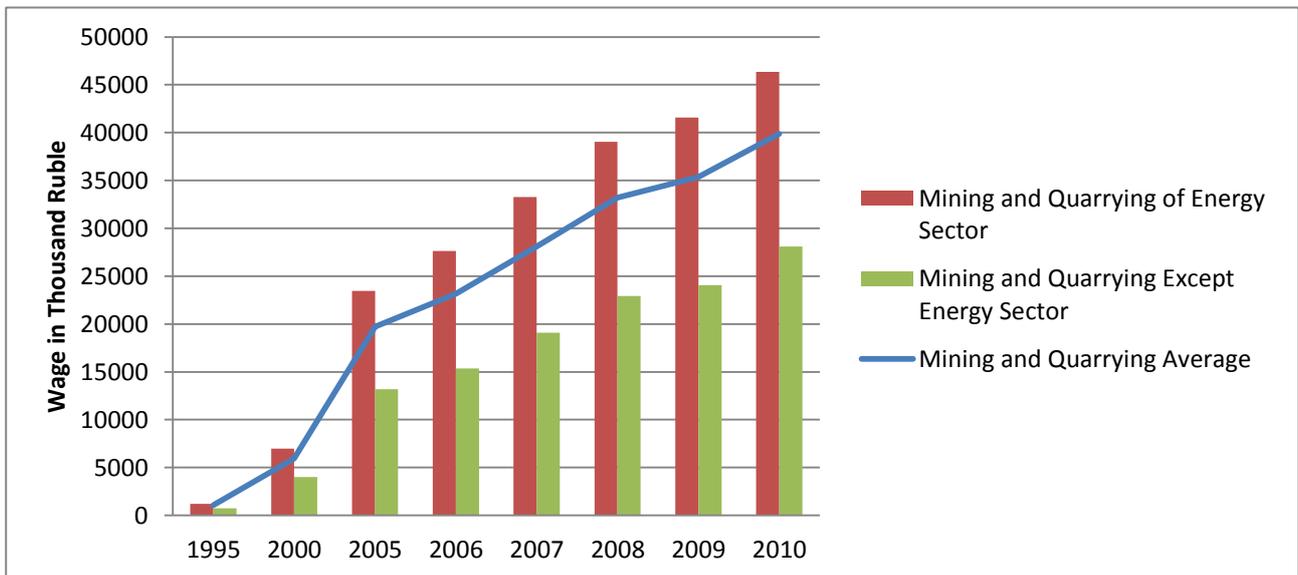
Source: Federal State Statistics service

Fig.6 Average Annual people Employed by Kind of Economic Activities



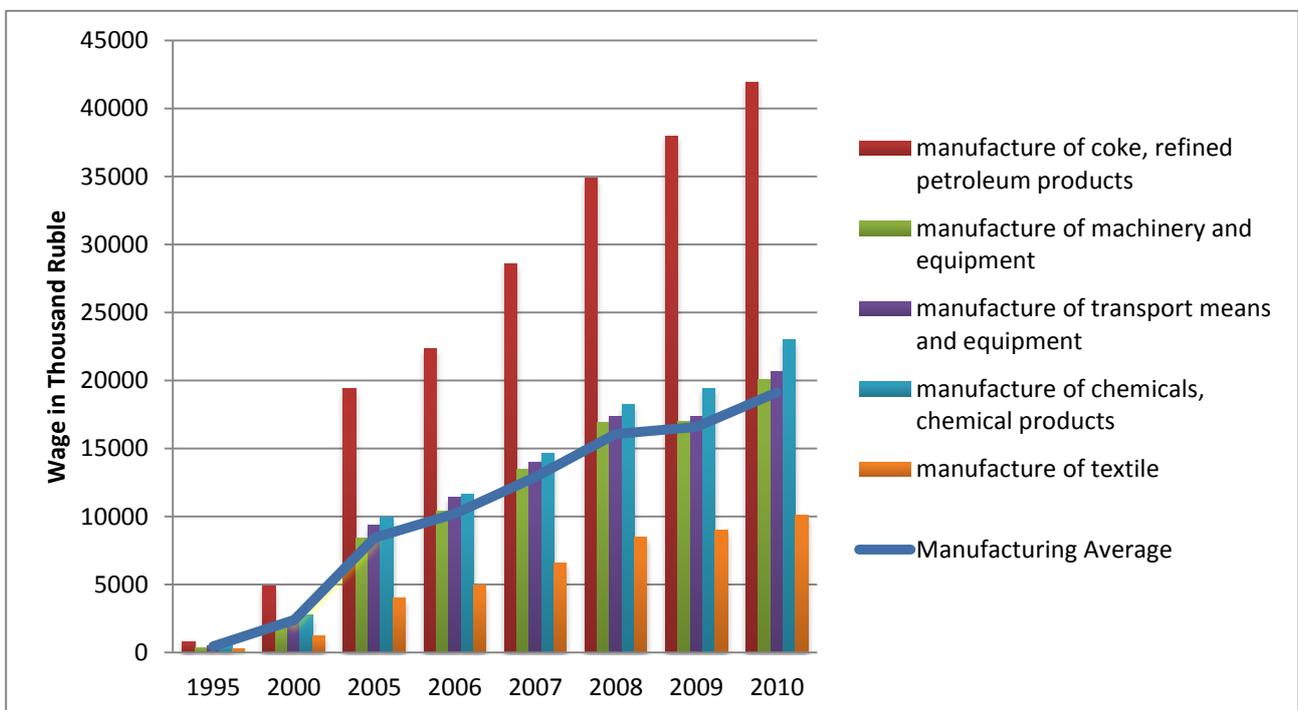
Source: Federal State Statistics Service

Fig.7 Average Wage Difference between the Mining and Quarrying Sector included Energy and Excluded Energy



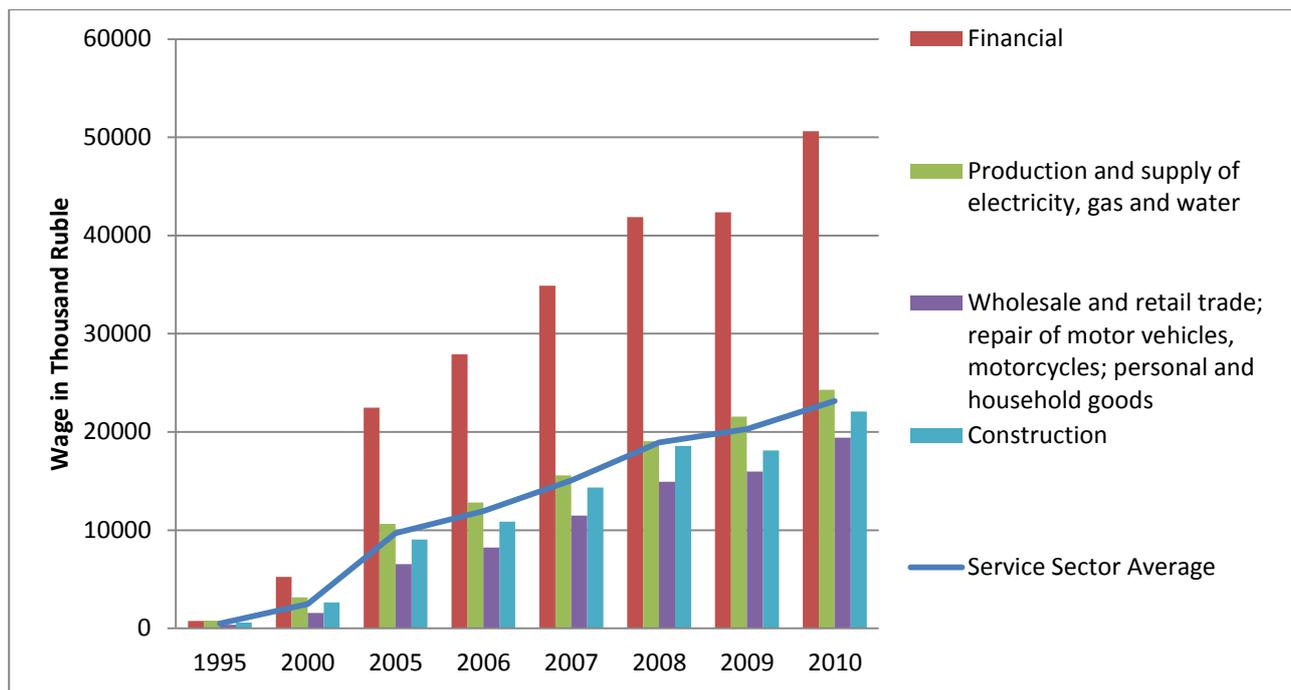
Source: Federal State Statistics Service

Fig.8 Average Wages of Manufacturing Sub-Categories



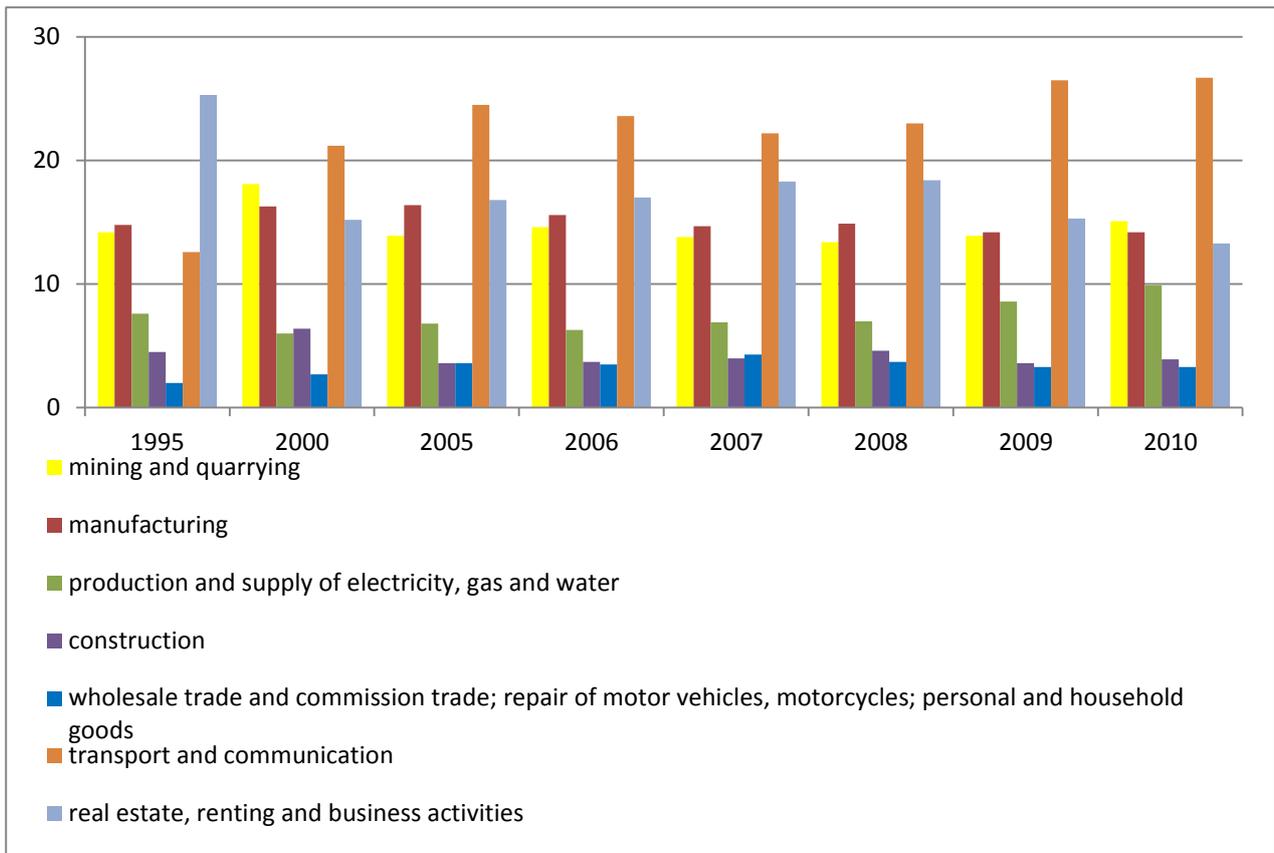
Source: Federal State Statistics Service

Fig.9 Average Wages of Service Sub-Categories



Source: Federal State Statistics Service

Fig. 10 Structure of Investment in fixed Capital by main Economic activities in %



Source: Federal State Statistics Service

Fig. 11 Factors Restricting the Increase in Production of Organizations by Kind of Economic Activities

	2008				2009				2010				
	March	June	Sep-tem-ber	De-cem-ber	March	June	Sep-tem-ber	De-cem-ber	March	June	Sep-tem-ber	De-cem-ber	
Mining and quarrying													
Insufficient demand for production of organizations in domestic market	17	14	13	28	37	40	39	40	37	33	31	29	29,83333
Insufficient demand for production of organizations in external market	4	4	4	8	11	11	11	11	8	6	7	6	7,583333
Competitive imports	2	2	2	2	1	2	3	3	4	4	4	3	2,666667
High level of taxation	38	40	39	37	37	37	35	37	35	39	40	38	37,66667
Deterioration and lack of equipment	36	35	35	32	25	27	27	27	25	29	30	30	29,83333
Uncertainty of economic situation	16	16	17	45	60	58	57	57	50	45	42	39	41,83333
High percentage of commercial loans	22	21	20	24	28	26	29	28	28	28	27	25	25,5
Lack of financial resources	33	32	32	41	48	45	46	47	46	43	40	40	41,08333
Lack of skilled workers	23	27	30	22	18	16	17	16	17	18	20	20	20,33333
Absence or imperfection of regulatory and legal framework	8	7	8	8	7	7	5	6	7	6	7	6	6,833333
No limitations	19	18	18	11	8	10	10	10	11	13	13	14	12,91667
Manufacturing													0
Insufficient demand for production of organizations in domestic market	38	37	38	52	60	64	62	61	61	56	53	51	52,75
Insufficient demand for production of organizations in external market	16	16	15	21	23	26	24	23	22	21	20	20	20,58333
Competitive imports	25	24	24	23	22	22	22	22	23	24	24	24	23,25
High level of taxation	37	41	40	39	39	39	40	41	41	40	40	41	39,83333
Deterioration and lack of equipment	33	33	32	27	23	21	21	21	22	23	24	24	25,33333
Uncertainty of economic situation	19	21	21	50	62	64	63	62	58	51	49	47	47,25
High percentage of commercial loans	25	27	26	32	37	38	38	39	37	33	33	32	33,08333
Lack of financial resources	37	40	38	47	50	51	48	49	48	44	44	44	45
Lack of skilled workers	37	40	40	31	23	19	19	19	19	21	23	24	26,25
Absence or imperfection of regulatory and legal framework	8	9	8	7	8	7	7	7	7	7	7	7	7,416667
No limitations	9	7	8	5	4	3	3	3	3	5	5	5	5
Electricity, gas and water production and supply													0
Insufficient demand for production of organizations in domestic market	19	19	20	21	20	25	25	24	25	24	23	23	22,33333
Insufficient demand for production of organizations in external market	30	35	32	33	33	26	28	27	24	29	31	32	30
Competitive imports	51	55	53	53	54	33	36	36	34	53	54	54	47,16667
High level of taxation	16	22	20	32	42	45	47	47	45	26	27	28	33,08333
Deterioration and lack of equipment	10	12	13	16	17	20	22	22	20	13	13	16	16,16667
Uncertainty of economic situation	53	60	60	64	60	48	53	52	50	56	59	58	56,08333
High percentage of commercial loans	16	24	22	21	19	10	12	11	11	13	14	15	15,66667
Lack of financial resources	17	19	21	20	21	14	13	15	15	12	12	12	15,91667
Lack of skilled workers	12	9	12	11	9	14	12	13	15	10	11	10	11,5

Source: Federal State Statistics Service