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The suspicion of Dutch disease in Russia and the ability of the government to counteract

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The paper argues that the Dutch disease in Russia may be hypothesised. The main justifications behind it are the extreme appreciation of real exchange rates, the relative deterioration of manufacturing and the relative improvement of service sector performance. However, it is difficult to prove the determining factors behind these processes, so the conclusion of having this ailment has to be treated carefully. As the Dutch disease is only one among determining factors of the resource curse hypothesis, in the case of Russia also other relevant (mainly institutional) aspects may play significant role, like continuous and considerable corruption, weaknesses of democratic political system, protectionist economic policy and low level of competition, especially in the case of energy sectors. All of the reasons behind the resource curse phenomenon, and among them the Dutch disease, can jeopardise long-run growth sustainability.

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1. Introduction

In general thinking, countries possessing rich natural resource deposits are blessed, as resource abundance has seemingly positive correlation with the wealth and economic development of a nation. However, experience shows that countries endowed with extreme amounts of natural resources have found themselves in a serious misuse and on a damaging growth path. Extraordinary resource possession is rather an opportunity than a guarantee for better economic performance.

Russia is one of the richest countries of the world in natural resources: the natural resource base includes major deposits of oil, natural gas, coal, and many strategic minerals. It is hardly to find natural resource type that is not to be found in its land of 16 995 800 km^2.[1]

Since the 1998 crisis, Russia ended 2006 with its eight straight year of economic progress with an average annual GDP growth rate of about 6.7%. Recently, the country's external balances have improved considerably too, together with a significant increase in foreign reserves. A huge budget surplus even made it possible for Russia to repay significant part of its external debt. Nevertheless, it is at least doubtful that Russia is able to keep its high real growth rates.

Much of these results can be attributed to a single sector: fuel production and the production of oil in particular. The present favourable macroeconomic situation of Russia is quite unsteady as it depends heavily on the performance of its oil industry and evolution of oil and gas prices. By expectations of experts, world consumption will be kept growing ensuring high oil prices, but the vulnerability of the Russian 'one-leg' economy remains high and in case of any shock on world energy markets it may stagger economic and consequently political development of a nuclear power.

The above-mentioned structural uniqueness of Russian economy parallel with the shocking oil price developments threatens analysts of existence of resource curse and arising of the so-called Dutch disease.

The remainder of the study is structured as follows. First, analysis will contain a short review of definitions on resource curse and Dutch disease, completed with a brief literature summary regarding to theoretical and empirical references. The second chapter investigates the role of point resources in the economy of Russia. Third part will move forward with the investigation of symptoms of Dutch disease, while the fourth part will flash some other relevant aspects regarding investigated topic. Finally, the analysis will end with the conclusions and the questions should be investigated henceforth.

2. Theoretical and empirical brief

Natural resources are naturally occurring substances that are considered valuable in their relatively unmodified, natural form. A commodity is generally considered a natural resource when the primary activities associated with it are extraction and purification, as opposed to creation.[2]

[1] 1.8 times the size of the second United States

[2] Wikipedia - The Free Encyclopaedia, natural resource and commodity definition: http://en.wikipedia.org/wiki/Natural_resource

By general opinion, countries possessing rich natural resource deposits are blessed, as resource abundance has seemingly positive correlation with the wealth and economic development of a nation. This is possibly a good opportunity to promote development. However, the experience shows that several countries, endowed with extreme amounts of natural resources were able to find themselves in a serious misuse and damaging development.

The so-called resource curse refers to this paradox when the natural resource abundance causes less growth than the lack of natural resources. Several studies proved this paradox. *Auty and Mikesell (1998)* concluded that there is empirical evidence that the most successful developing countries are resource-poor, and that most resource-rich countries averaged relatively slow growth or stagnation during the past three decades. *Sachs and Warner (1995)* have shown that economies with a high ratio of natural resource exports to GDP tended to have low growth rates. Another aspect of resource curse can be found in *Auty (2001)*, as countries rich in resources are more prone to growth collapses than resource-deficient ones. Overall, there is strong evidence that states with abundant resource wealth perform less well, than their resource-poor counterparts, but there is little agreement on why this occurs *(Ross, 1999)*.

There are several explanations why resource rich countries under-perform despite abundance. *Auty (2001)* elaborates exogenous and internal reasons, where one of the exogenous explanations is referring to the phenomenon of Dutch disease.

Dutch disease is an economic concept that explains a relationship between the exploitation of natural resources and a decline in the manufacturing sector.[3] This was the case in the Netherlands after having discovered enormous gas deposits in the North Sea in the 1960s.[4] The Dutch guilder experienced a vast appreciation pressure due to income inflow. This influenced badly competitiveness of non-oil-gas exports. Among others (factor redistribution among booming and lagging sectors), it caused serious problems for the Dutch economy as a whole.

Ross (1999) distinguishes macroeconomic and political science type reasons behind the resource curse. Dutch disease is one of the ailments interpreted on macroeconomic basis. There are also three other economic reasons mentioned by *Ross (1999)*: decline in terms of trade for primary commodities, vulnerability and volatility of international commodity markets and poor economic relations between resource and non-resource industries. On the political mismanagement of resource abundant countries, aspects like cognitive expectations, societal explanations and weakening of state institutions are mentioned.

Corden and Neary (1982) in details, *Corden (1984)* in short give formal frame for the phenomenon with a three-sector core model. The three sectors are resource or booming tradable sector, like oil and gas sector; lagging tradable sector, like manufacturing; and non-tradable, like services. The booming sector experiences initial effect of raising incomes of the factors employed. This can happen in two ways: booming sector produces for export, with no sales at home, there has been an exogenous price rise on the world market relative to the price of imports.

[3] Both *Corden (1984)* and *Ross (1999)* refer to the Economist 26th November 1977, pp 82-83 article, as the first appearance of the notion called Dutch disease.

[4] Some experts however explain the weak performance of the Netherlands in that years by structural rigidities determined by welfare state conditions.

Two effects may occur. One of them is the *spending effect.* Extra incomes generated by booming sector are spent directly by owners of factors or indirectly through government collected taxes, thus prices of non-tradable products will rise. This means real appreciation. It will draw resources out of booming and lagging to third sector. The other one is the *resource movement effect*. The marginal product of labour rises in the booming sector, demand for labour rises in booming sector and this draws resources, namely labour out of other two branches. This process appears in two ways. *Direct de-industrialization* refers to the effect when labour force moves from lagging sector to the booming sector resulting in lower output in lagging one. *Indirect de-industrialization* happens, when labour force moves from non-tradable to booming sector resulting in labour movement to non-tradable from lagging sector through given mechanism.

While the phenomena of Dutch disease most often refers to natural resource discovery, it can also be explored in connection with large inflow of foreign currency, including a sharp surge in natural resource prices, foreign assistance and foreign direct investment, and also in connection with the absorption of EU resources.[5]

The political economy of resource curse has several directions investigated, like the connection between resource abundance and civil wars, and democracy, and political systems etc. Among others, *Ross (1999)* made effort to overview the political aspects of resource curse. Nevertheless, problems still exist, several political economy explanations are known, the aim of the study to investigate the suspicion of Dutch disease in Russia by looking on symptoms of this "economic illness".

3. Oil and gas dominated Russian economy

Russia is one of the richest natural resource country possessing major deposits of oil, natural gas, coal and many strategic minerals. It is hardly to find natural resource type that is not found on its territory of 16 995 800 km^2 that is 1.8 times the size of second United States.

Russia disposes of 6.5% of oil proved reserves (7^{th} behind five Middle East countries and Venezuela), and 26.6% of natural gas proved reserves (1^{st} followed by Iran 14.9% and Qatar 14.3%). By 2005 data, the Federation responsible for more than 12% of world's total oil production that makes Russia ranked second worldwide after Saudi Arabia (13.5%) and followed by US (8.0%), while in natural gas production Russia posses the first place with its 21.6% share in total. (*BP, 2006*)

The gap (net exports in tonnes) defined by difference between the production and consumption increased during 1997-2005, as parallel with the annual average 7% increase of production consumption has stagnated, thus net exports increased in average by more than 10% annually. This means that from 1997 to 2005, Russia managed to double its net exports of oil. The share of net oil exports from oil production increased from 58% to 72%.

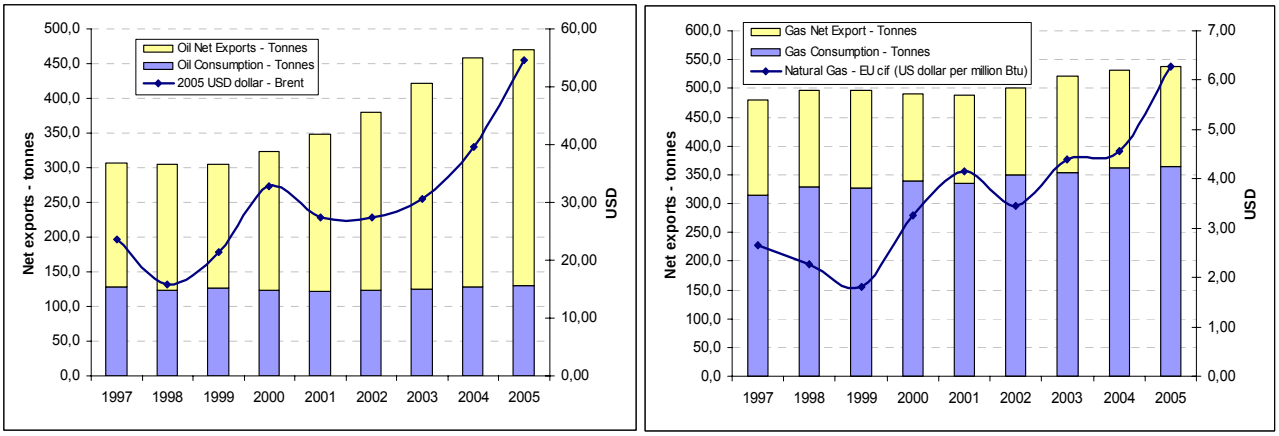
As concerns natural gas, change is less spectacular as in case of oil. Although production of gas increased by more than 12% in the period of 1997-2005, the structure of developments is different. Consumption of

[5] The case of attraction of EU resources is elaborated in newspaper article of *Váradi (2006)*

natural gas has increased by 15.6%, while net exports only by 5.9%. This led to increasing share of consumption in production. (*Chart 1*)

However, as it can be seen on the graph, increase of oil net exports is in line with price developments that made efficient to extract Russian type (Ural) oil reserves. In case of natural gas difficult to identify such trivial connection, but this is in line with the nature of gas consumption.

Chart 1. Oil and natural gas prices and net exports development in Russia, 1997-2005



Note: Oil production (consumption + net exports) and oil price development on the left side, natural gas production (consumption + net exports) and gas price on the right side Source: BP (2006)

Price developments of oil and gas are strongly correlated; usually gas price follows oil price with some time delay. In the period of 1993-2005, crude oil prices increased by 223%, while natural gas by 148%. It is important to note, price increases first accelerated in 1998-1999 and later with a short correction in 2003.

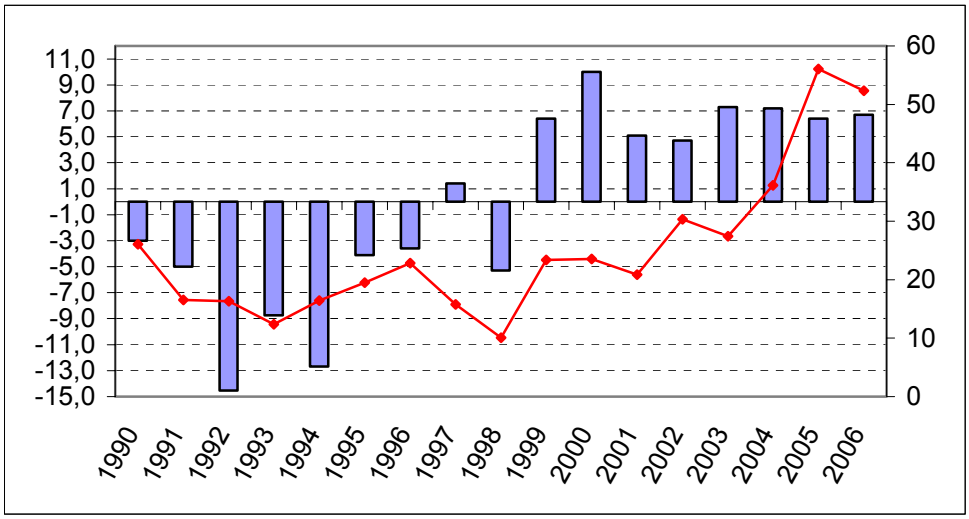
As regarding the share of oil and gas exports value from total exports, the dependence of Russian Federation on energy resources increased. The share of energy resources in export of goods increased by almost 10 percentage points to 61.1% in the course of 2001-2005. By known quarterly data on the current year, it can exceed 65% in the end of 2006. (*Source: Federal State Statistics Service*)

In January – August of 2006 crude oil exports increased by 35.7% as compared to the same period of the previous year. The same data for the natural gas exports is 44.2%. Both of oil and gas exports increased above the average of export rise. (*Source: Federal State Statistics Service*)

Thus, Russian GDP growth - facilitated mainly by the export performance that heavily depends on natural resources (especially on oil and gas industries) – is in clear connection primarily with oil price developments.

After the painful transition in 1991-1996 and the collapse of Russian economy in 1998, economic growth has been spectacular, as Russia ended 2006 with its eight straight year of economic progress with an average annual GDP growth rate of about 6.7%. (*Chart 2*) It is also clear that the increase of crude oil prices played important role in the economic recovery.

Chart 2. Real GDP growth (left) and Crude oil price (right) in Russia, 1990- 2006



Note: Russian Urals Spot Price FOB (USD per barrel), Gross domestic product, constant prices annual percent change.
Source: WIIW, EIA

Although estimates vary widely, the World Bank has suggested that Russia's oil and gas sector may have accounted for up to 25% of GDP in 2003 while employing less than 1% of the population. (*EIA, 2006*) The share from GDP has likely grown in the last three years.

Russian economist, *Gurvits (2006)* investigated the fiscal and monetary policy conditions by unstable externally led economic booming. He founded that the fluctuation of receipts on natural resource exports in the period of 1995-2005 was resident within the -9% and +12% of GDP. Under the current tax system conditions, it would mean fluctuations of budgetary receipts within the -4% and 9% of GDP.

The budget performance is also dependent on oil sector performance, as considerable extra windfalls helped Russia to improve federal and consolidated government balances and to reduce radically public sector debt. The consolidated government balance improved significantly, as from the 1.3% surplus in 2003 it increased to 4.5% in 2004, 7.7% in 2005 and the surplus is to reach closed to the 10% of GDP in 2006. Oil Stabilization Fund established in 2004 reached the amount of USD 83.2 billion at the end of November 2006. (*See Appendix 1*)

Spilimbergo (2005) came out with the finger rule: sensitivity of federal revenues to a USD 1 per barrel of Ural blend oil price increase for a year 2005 (for prices above USD 24 per barrel) was estimated to be 0.40% of the GDP. It means that one unit change in oil price pulls up revenues by 0.40% of GDP. This embodies significant risk for the budget in case of price shocks.

Monetary indicators tell of current developments, as reserves reached USD 303.732 billion at the end of 2006. (*See Appendix 1.*) This is probably the effect of sterilisation efforts made by monetary authorities to handle extra foreign currency inflow. This is a problem as it means also extra cost for Central Bank. The oil price led exchange rate appreciation destroys the Central Bank's aim to follow calculable monetary policy.

As it is proven in the chapter, Russian economy depends on its two most important natural resources, crude oil and natural gas, either having a look on export structure, GDP composition, or development of fiscal and

monetary indicators. Oil and gas price developments of recent years are seemingly favourable processes, but also significant challenges, as they may jeopardise long run sustainability of Russian growth.

4. Symptoms of Dutch Disease

After having been convinced of importance of energy resources in Russian economy, for having suspicion of Dutch disease, one has to investigate development of real exchange rates, manufacturing and service sector performance. Nonetheless, it is difficult to recognise the Dutch disease as the reasons behind above-mentioned factors and the relationship between all of them are difficult to prove.

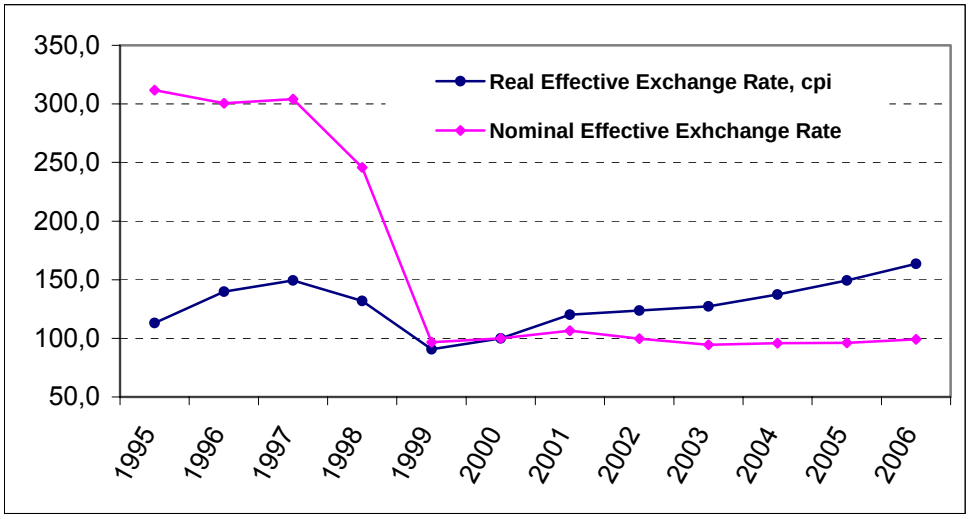
The current chapter intends to investigate three of aspects that possibly determine whether there is a room for suspicion of having Dutch disease.

Real exchange rate appreciation

First looking at the development of real effective exchange rate (REER) within 1999 and 2006 (*see Chart 3.*), on can observe permanent appreciation.[6]

The REER is an indicator of competitiveness. A fall indicates an improvement in competitive position, while an increase indicates real appreciation and the worsening of competitive position. The latter can be a result of a nominal appreciation of local currency, but also the changes in relative prices (inflation developments). By the given data on NEER and REER, the relative prices (measured by CPI) of domestic products increased.

Chart 3. Nominal and real effective exchange rates, 1999-2006



Note: Index Numbers (2000=100), period averages, Source: IMF

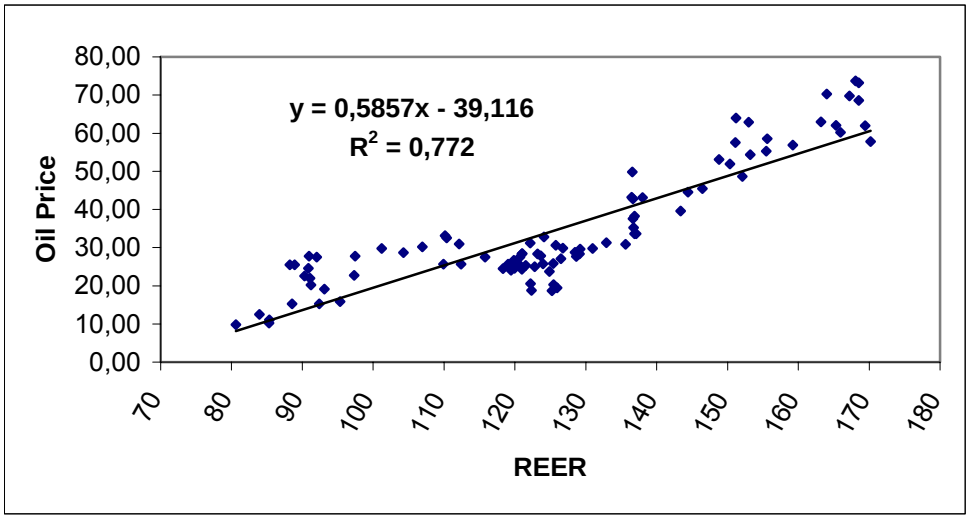
[6] Real Effective Exchange Rate (REER) refers to the weighted average exchange rate of the local currency vis-à-vis a basket of foreign currencies adjusted for inflation rate differentials with a country's trading partners. This is simply the rouble's nominal effective exchange rate (NEER) multiplied with the ratio of the domestic price index to the weighted price index of the countries whose currencies comprise the NEER basket : REER = NEER x Pj / Pw where Pj = domestic price index Pw = world price index.

At the same time, it is fair to mention that other factors can come into question in connection with real effective exchange rate appreciation. The real exchange rate developments have positive correlation with the productivity. This phenomenon is called Balassa-Samuelson, effect and widely debated across the scientific discussion. Égert (2005) investigated the BS effect on 3 South-eastern-European, on two CIS (one of them Russia) and on Turkey and "the Balassa-Samuelson effect is found to play only a limited role for overall inflation and real exchange rate determination". He found possibly rather relevant factors in determining inflation differentials, like oil price shocks, cyclical factors and differences in growth rates, catching up in tradable, regulated-administered prices, or also the credibility of economic policy.

The REER development also a sign of changes in relative prices of tradable and non-tradable products. If the prices of non-tradable, services increase and parallel the prices of tradable stagnate or increase at a slower peace, the real exchange rate appreciates. This seems happen in the Russian case.

All in all, a strong correlation is found between oil price development and REER development. (*Chart 4*)

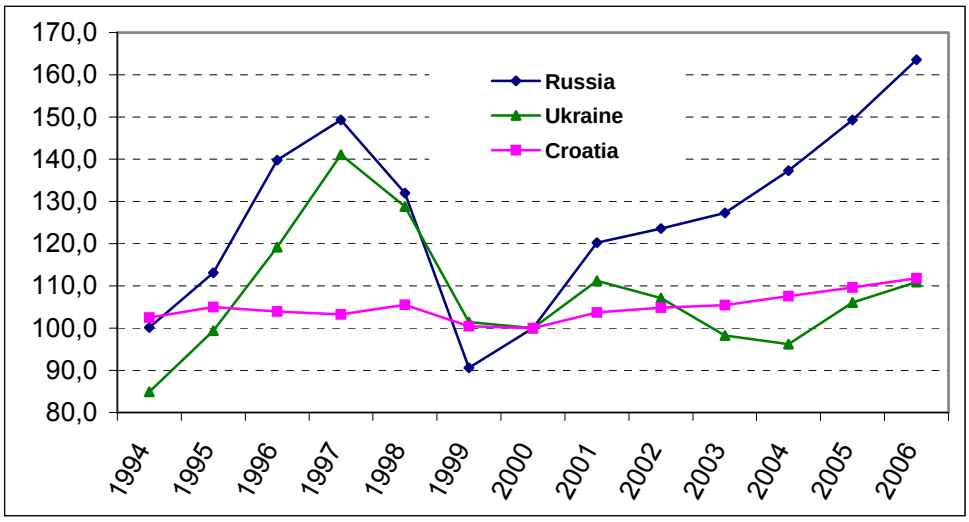
Chart 4. The Strength of Correlation of Oil Price and REER development, 1999-2006



Source: BIS, EIA

If comparing Russia with two other countries, Ukraine (also CIS transition country) and Croatia (also transition country), some intuitive conclusions can be drawn. Ukraine and Russia with an approximately similar economic development level, with common institutional and historical features, in 1994-2001 did show similar paths of REER. Both countries were similarly seriously influenced by the financial crisis in 1998. Since 2001, the trend lines of REER of these states left each other, particularly as a consequence of crude oil price movements. The main difference between Russia and Ukraine is the role of fuels related industries in the economy and in exports. Croatia is also a transition country, with significant structural changes in the economy, here is used as a control factor. (*Chart 5*)

Chart 5. Development of REER in Russia, Ukraine and Croatia, 1994-2006

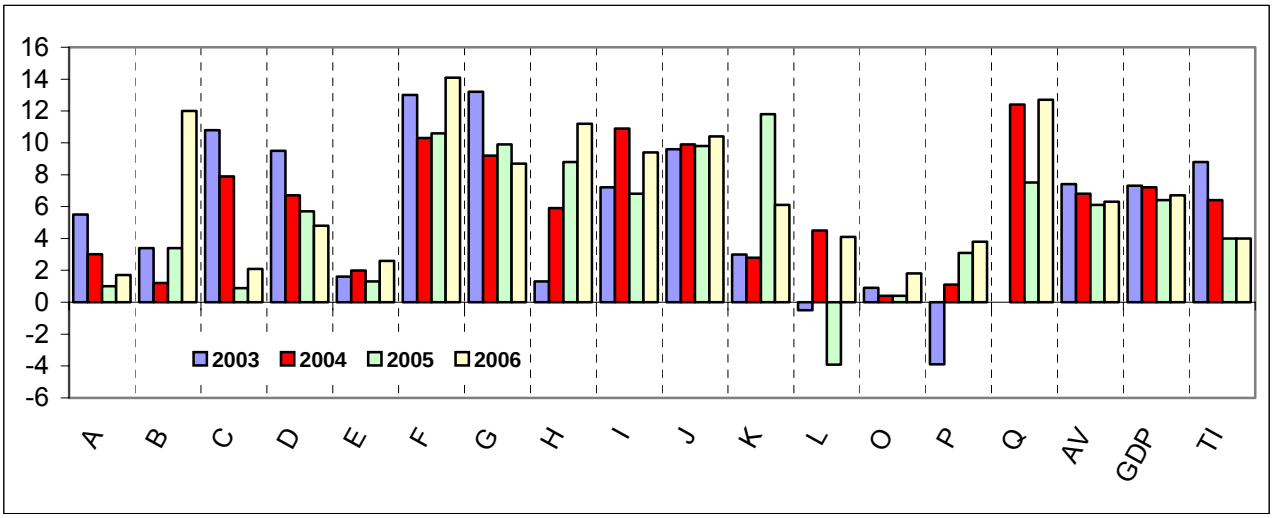


Note: Index Numbers (2000=100), period averages
Source: IMF

Declining Manufacturing and Well-performing Service Sectors

When the oil and gas price rise accelerated in 2003, the REER appreciation followed this pace, and the manufacturing sector performance started to worsen that can be seen on the *Chart 6*. On yearly basis, from 2003 manufacturing sector has experienced slowdown in 3 consecutive years. (*Appendix 2*)

Chart 6. Output development by economic activities 2003-2006



** ISIC classification: A-B agriculture, hunting, forestry and fishing, C-F industry, G-Q services, AV added value, TI total industry (in details abbreviations and numerical data in Appendix 3)*
Source: WIIW, Federal State Statistics Service

Chart 6 shows the output growth of different branches in the period of 2003-2006. Growth performance of agricultural type activities has worsened (A), only the fishery improved (B). With exception of construction (F) all branches of industry (C-E) growth slowed down as well, that was led mainly by its main contributor, manufacturing (D) – total industrial (TI) output underpins this argument. Overall GDP growth rates were

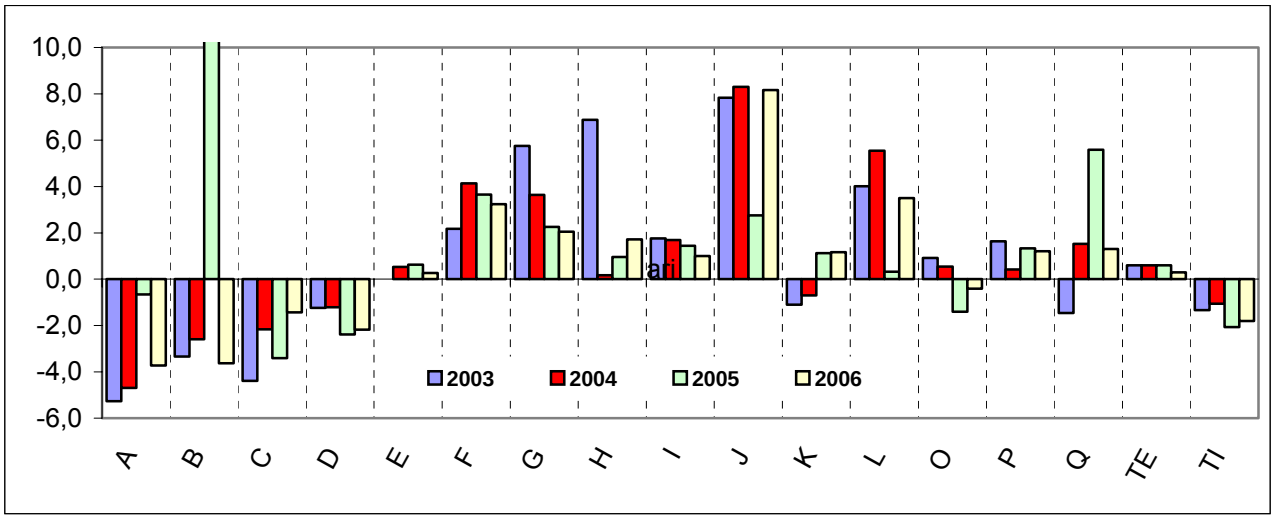
saved by service activities, as almost all of them (G-Q) realised improving real growth rates in 2003-2006. (*Appendix 2*)

As a matter of fact, the share of industry in GDP increased in 2003-2006, particularly as a consequence of booming mining and quarrying activities, but also, because of the manufacturing sector. Industry reached 28.5% of GDP increasing in the course of four years by 4.4 percentage points. This rise was divided in the following way: mining and quarrying (3.2 pp), manufacturing (1.7 pp), electricity, gas and water supply (-0.3 pp). The role of manufacturing increased in GDP, however its contribution to GDP growth felt back. As concerning the service sector, this sector's share in GDP decreased in 2003-2004 by 4.4 percentage points, offsetting that of the increase in the industrial sector. (*Appendix 3*)

Regarding employment developments of Russia (*Appendix 4 and 5.),* in 2003-2006, total employment increased by 8 million persons, particularly on expense of agriculture and in favour of industry and service sector. The share of employment in agriculture, hunting, forestry and fishing decreased by 2 percentage points and reached 10%. Industrial employment has practically stagnated (decreased by 0.2 percentage points). However, employment of service sector increased by 2 percentage points.

Chart 7 shows that the employment in the agricultural activities decreased (A-B). The industry (TI), also experienced decreasing employment, particularly driven by the mining and quarrying (C) and manufacturing (D) sectors. Almost all sectors of service activities realised increasing employment.

Chart 7. Employment growth by economic activities, 2003-2006



** ISIC classification: A-B agriculture, hunting, forestry and fishing, C-F industry, G-Q services, TE total employment value, TI total industry (in details abbreviations and numerical data in Appendix 3)*
Source: WIIW, Federal State Statistics Service

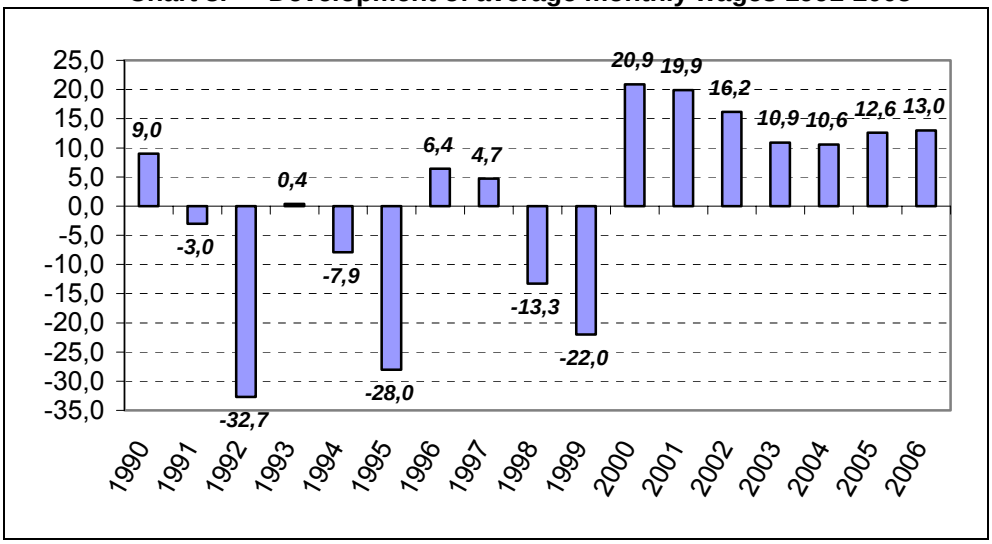
Concerning investments, total gross investments increased in real terms by 12.5%, 13.7%, 10.9% and 13.7% in 2003-2006, respectively. However this happened parallel with interesting structural changes observed if investigating the shares of different activities. *Appendix 6* shows, that share of industry in investments decreased particularly due to manufacturing. However within industrial investments (100%) significant changes have not happened.

In case of FDI, the extraction of mineral resources attracted 43.3% of total FDI in by the data calculated on first nine months of 2006. Manufacturing excluding metallurgy and, coke and oil products has continuously lost its share from 18.7% in 2004 to 17.1% in the first nine months of 2006. The FDI shows increasing interest to accumulate in service sectors, like finances, real estate operations, communication.

It is fair to mention that the manufacturing sector by our used ISIC classification includes activities that are in tight relation with the oil and gas, like coke, refined petrol production, or chemicals, chemical production, man-made fibres production that responsible for more than 20% of total manufacturing production, while employing only 6-7% of total. So our observations about the non-oil related manufacturing sector can be even worse.

Finally, as for wages, after 2000 real wages started to grow sharply. (*Chart 8*) In 2003-2006, the average monthly gross wages real annual growth rate was closed to 12%. The mining and quarrying industry and the related manufacturing branches not only used to have the highest wages in the economy, but also the growth rate of wages also used to exceed that of the average.

Chart 8. Development of average monthly wages 1991-2005



Note: in rouble, 1991 price
Source: Federal State Statistics Service

Via running through factors that need to be investigated in order to identify the symptoms of Dutch disease, Russia has to deal with the menace of disease, especially as concerns the developments of recent years. However, the suspicion is not confidence. With considerable abstraction, possibly the core model determined *spending effect* is the relevant channel.

Extra windfalls of booming sector are spent either by the owners of factors or by the government that causes increase of relative prices of non-tradable goods (services) generating real appreciation. The change in relative prices results in factor movement from tradable sectors into non-tradable.

The investigation of symptoms has shown these changes, but the mechanisms and the reasons leading to this point are not manifested by empirical investigation.

The *Corden and Neary (1982)*, *Corden (1984)* model of Dutch disease may fit countries like Russia poorly, especially if having a look on the core model assumptions. *Ross (1999; page 306-307.)* collects the doubts about it. "The model assumes that the economy's capital and labour supplies are fixed and fully employed before a boom begins. Under these conditions, a booming resource sector should draw capital and labour away from agriculture and manufacturing, thus raising their production costs." However Russia has probably labour surpluses. "Domestic and foreign goods are perfect substitutes; is this assumption is eased – reflecting the fact that manufacturers in developing states often import intermediate goods, which become cheaper when the exchange rate appreciates – then the Dutch disease may not damage the manufacturing sector's competitiveness"

Overall the phenomena can create hardships for such resource exporters, like Russia and at least the suspicion of having the symptoms is pertinent, even if it may be effectively counteracted by governments in case of flexible political and economic institutions. Nevertheless, sometimes governments fail to take appropriate measures to avoid resource curse. As Russia is a young democracy and young market economy, it is difficult to prove these conditions and that is why other aspects might be relevant.

Export structure development

What is more interesting, the development of export structure in the last decade. *Annexes 7 and 8* prove data calculated by two methodologies. Both shows extreme importance of mineral products and fuels in Russian total exports. As of dynamics, in the last ten years 1995-2005 Russia's dependence on fuel exports increased considerably. In 2005 and by known data on 2006 it is accelerating, thus reflecting pressure on sustainability of economic growth. All the others commodities (especially manufacturing) have suffered decreasing importance. In the past important branches, like machinery and equipment, chemical production show slow decline.

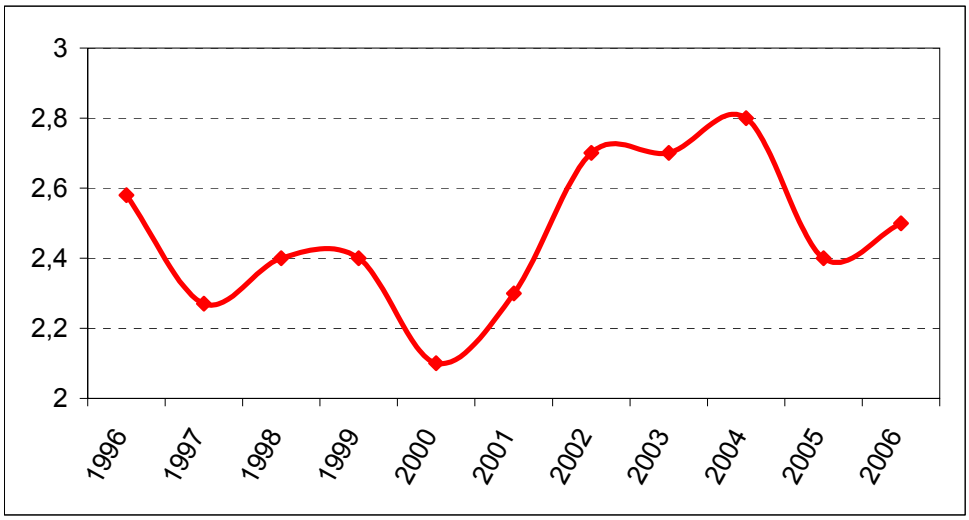
5. Other relevant aspects

In determination of resource curse, the Dutch disease is only one among several factors, a resource abundant country has to face. These factors are likely to appear parallel and cause serious challenge for the economy. Two relevant factors are exposed. These aspects may weaken the capability of governments to interact effectively or to prove appropriate conditions for the invisible hand to allocate factors optimally.

By *Papyrakis and Gerlagh (2004)* a resource abundant country, suffering from corruption, low investments, protectionist economic policy, low quality of education is unlikely have favourable processes in its economy because of indirect effects.

If taking the corruption, by *Transparency International Corruption Perception Index*, Russia possesses the 121st place on a scale of 165 countries in tie with countries, like Benin, Honduras and Swaziland. From Europe only Belarus has worse ranking. If taking the dynamic of CPI index developments can be evaluated as positive. (*Chart 9*) However, this happened parallel with worsening relative position in country ranking.

Chart 9. Development of Russian Corruption Perception Index, 1996–2006



Source: Transparency International

The economic policy is robustly protectionist, especially if taking the energy related sectors. Additionally, Russia uses its oil and gas power to solve other, diplomatic, political and other type issues.[7] The contestability of oil and gas production is completely restricted; the aspects of competition hardly predominate.[8] Analysis of *Gelb (2006)* is engaged in details of currents state of oil and gas situation in Russia. The lack of contestable oil- and gas production excludes technological and management spill over effects, narrows the possibility of effective capital allocation and gives floor for politically motivated rent seeking activities.

The oil also can hinder democracy. *Ross (2001)* shows that one of components of resource curse is the authoritarian-rule. The substance of it is the assumption that the excessive influence of the oil sector in an economy can undermine democracy, inasmuch as leaders of a country are inspired to restrict operation of democratic institutions.

The *Freedom House's Freedom in the World index* ranks Russia by two partial indexes. As of political rights (index measured on a 0-40 scale, where 0 is refers to lack, 40 is total freedom), Russia assessment has worsen for the last 4 years by 6 points and now stays at 11. In the case of civil rights (index measured on a 0-60 scale), it has frozen on 25 points. All in all Russia is *Not Free*.

The problem is that the temptation of spending this money is considerable. By *Gurvits (2006),* a poll was made with the result: 88% of population would patronise the playing away of Stabilization Fund money. This embodies significant pressure on political decision-making. The fiscal policy spending much on non-productive spending may have intention to play on welfare-based legitimacy and to avoid the usage and improvement of institutions.

[7] Ukraine, Moldova and Georgia are the last victims of gas gun.

[8] The case of Yukos and Hodorkovszki.

Concluding remarks

Russia has to deal with the menace of disease, especially as concerns the developments of recent years. It is true even having high growth rates. Through testing the model defined by *Corden and Neary (1982)*, *Corden (1984)* we concluded that especially after 2003 Russian economic data develop reflecting the symptoms of Dutch disease: real exchange rate has accelerated, the prices of services increased relative to tradable prices, the manufacturing growth slowed down, while the service sector performed well, the employment shifted to service sector. These happened particularly through the spending effect. Extra windfalls of booming sector are spent either by the owners of factors or by the government that causes increase of relative prices of non-tradable goods (services) generating real appreciation. The change in relative prices results in factor movement from tradable sectors into non-tradable.

The investigation of symptoms has shown these changes, but mechanisms and reasons leading to this point are not manifested by empirical investigation, and even the core model assumptions make us treat this result with reservation. *Ahrend et al. (2007)* points that it is extremely difficult to prove the factors behind the Dutch disease.

Anyway, Dutch disease may be effectively counteracted by governments in case of flexible and well-operating political and economic institutions. Resource curse and the Dutch disease are the phenomena, when state involvement is needed and reasonable. *Ross (1999)* came to the conclusion that the role of governments extremely important, as the state plays and exceptionally large role in the resource sectors and they have the policy tools to counteract hardships originated from resource abundance. They can offset a steady decline in the terms of trade by investing in the productivity of their resource sectors and by diversifying their exports. They can buffer their economies against the vicissitudes of international commodity markets by using commodity stabilization funds and careful fiscal policies. They can use their commodity windfalls to promote upstream and downstream linkages; and they can counteract the Dutch disease by maintaining tight fiscal policies, temporarily subsidising their agricultural and manufacturing sectors, and placing their windfalls in foreign currency to keep their exchange rates from appreciating.

Extra budgetary revenues have to be spent in order to narrow the tax burden, ensure additional and preferential investment resources for sectors suffering from decreasing price competitiveness (manufacturing), improve long run growth factors (like education, infrastructure and research) and realise structural reforms.

Of course, the possibility of government failure still may exist. Governments often fail to take measures in order to avoid problems by resource abundance or resource price boom. The growing up of natural resources related ailments is particularly based on political economy reasons like continuous and considerable corruption, rent seeking attitude, weak and captured state, weaknesses of democratic political system, protectionist economic policy and low level of competition, especially in case of energy sectors.

Thus, opening oil and gas sector to international competition, establishment of free media and strict fiscal rules on spending the oil and gas windfalls might be crucial steps in order to prove wealth maximising and long run sustaining economic growth.

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Appendix 1. Relevant economic indicators, 2001-2006

	2001	2002	2003	2004	2005	2006									
	Yr	Yr	Yr	Yr	Yr	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
Output Indicators															
GDP, % change, y-o-y 1/	**5.1**	**4.7**	**7.3**	**7.2**	**6.4**	-	-	5.5	-	-	7.4	-	-	**-**	-
Industrial production, % change, y-o-y	**4.9**	**3.7**	**7.0**	**8.3**	**4.0**	4.4	1.0	4.1	4.8	10.6	2.9	2.9	5.6	4.1	5.4
Manufacturing, % change, y-o-y	**-**	**1.1**	**10.3**	**10.5**	**5.7**	4.1	-0.1	5.7	5.6	15.1	2.8	2.5	6.2	5.1	7.5
Extraction of mineral resources, % change, y-o-y	**-**	**6.8**	**8.7**	**6.8**	**1.3**	0.9	1.1	1.8	3.8	3.6	2.4	3.1	3.8	1.7	0.6
Fixed capital investment, % change, y-o-y	**8.7**	**2.6**	**12.5**	**10.9**	**10.5**	4.2	2.3	10.8	10.8	18.8	12.6	10.7	12.6	15.0	19.1
Fiscal and Monetary Indicators															
Federal government balance, % GDP 1/	**3.0**	**1.4**	**1.7**	**4.3**	**7.5**	13.9	11.4	10.9	9.0	9.5	8.7	8.7	8.8	8.7	9.2
Consolidated budget balance, % GDP 2/	**-**	**-**	**1.3**	**4.5**	**7.7**	-	-	12.5	-	-	11.0	-	-	-	-
M2, % change, p-o-p 3/	**44.6**	**34.1**	**44.8**	**42.5**	**35.6**	-3.4	1.3	4.2	3.1	5.2	6.0	2.0	3.0	4.1	0.2
Inflation (CPI), % change, p-o-p	**18.6**	**15.1**	**12.0**	**11.7**	**10.9**	2.4	1.7	0.8	0.4	0.5	0.3	0.7	0.2	0.1	0.3
GDP deflator 1/	**16.5**	**15.7**	**14.0**	**19.5**	**19.6**	-	-	23.3	-	-	20.1	-	-	-	-
Producer price index (PPI), % change, p-o-p	**8.3**	**17.7**	**12.5**	**28.8**	**13.4**	0.4	3.2	2.1	0.6	1.8	0.8	1.7	2.2	1.4	2.8
Nominal exchange rate, average	**29.2**	**31.4**	**30.7**	**28.8**	**28.3**	28.4	28.2	27.9	27.6	27.1	27.0	26.9	26.8	26.7	26.9
Real effective exchange rate, 2000 = 100	**120.3**	**123.6**	**127.3**	**137.3**	**149.2**	152.3	154.6	156.5	156.5	156.4	158.3	67.2	64.7	70.7	76.6
(IMF) Real effective exchange rate, % change, p-o-p (IMF)	**20.3**	**2.8**	**3.0**	**7.9**	**8.7**	0.2	1.5	1.3	0.0	-0.1	1.3	-	-	-	-
Stabilization Fund bln USD, end-o-p	**-**	**-**	**-**	**18.7**	**42.9**	51.6	55.4	60.4	66.0	71.5	76.3				
Reserves (including gold) billion USD, end-o-p	**36.6**	**47.8**	**76.9**	**124.5**	**182.2**	188.5	195.9	205.9	226.4	247.3	250.6	265.7	259.9	266.2	272.5
Balance of Payment Indicators															
Trade Balance, billion USD	**48.1**	**46.3**	**59.9**	**86.9**	**118.3**	12.3	11.7	11.8	13.0	14.6	11.1	12.0	13.7	11.3	**-**
Share of energy resources in export of goods, %	**51.2**	**52.4**	**54.2**	**54.7**	**61.1**	-	-	67.6	-	-	65.4	-	-	65.2	**-**
Current Account, billion USD	**33.9**	**29.1**	**35.4**	**58.6**	**84.2**	-	-	28.0	-	-	28.8	-	-	23.1	**-**
Export of goods, billion USD	**101.9**	**107.3**	**135.9**	**183.2**	**243.6**	20.9	22.1	24.5	24.1	27.2	25.4	25.8	28.1	25.9	**-**
Import of goods, billion USD	**53.8**	**61.0**	**76.1**	**96.3**	**125.3**	8.6	10.4	12.7	11.1	12.6	14.3	13.7	14.4	14.5	-
Gross FDI, mln USD 1/	**3980**	**4002**	**6781**	**9420**	**13072**	-	-	3845	-	-	6445	-	-	10268	-

1/ Cumulative from the year beginning
2/ Federal and consolidated regional budgets (no extra budgetary funds)
3/ Annual change is calculated for average annual M2

Source: World Bank (2006)

Appendix 2. Real GDP growth by main activities, 2003-2006 (%)

Code	Economic Activity	2003	2004	2005	2006
A	**Agriculture, Hunting and Forestry**	5,5	3,0	1,0	1,7
B	**Fishing**	3,4	1,2	3,4	12,0
C	**Mining and Quarrying**	10,8	7,9	0,9	2,1
D	**Manufacturing**	9,5	6,7	5,7	4,8
E	**Electricity, Gas and Water Supply**	1,6	2,0	1,3	2,6
F	**Construction**	13,0	10,3	10,6	14,1
G	**Wholesale and Retail Trade; Repair of Motor Vehicles, Motorcycles and Personal and Household Goods**	13,2	9,2	9,9	8,7
H	**Hotels and Restaurants**	1,3	5,9	8,8	11,2
I	**Transport, Storage and Communications**	7,2	10,9	6,8	9,4
J	**Financial Intermediation**	9,6	9,9	9,8	10,4
K	**Real Estate, Renting and Business Activities**	3,0	2,8	11,8	6,1
L	**Public Administration and Defence; Compulsory Social Security**	-0,5	4,5	-3,9	4,1
O	**Education**	0,9	0,4	0,4	1,8
P	**Health and Social Work**	-3,9	1,1	3,1	3,8
Q	**Other Community, Social and Personal Service Activities**	0,0	12,4	7,5	12,7
AV	**Added Value**	**7,4**	**6,8**	**6,1**	**6,3**
GDP	**Gross Domestic Product**	**7,3**	**7,2**	**6,4**	**6,7**
TI	**Industry**	**8,8**	**6,4**	**4,0**	**4,0**

Note: NACE classification
Source: WIIW

Appendix 3. GDP and GVA by main activities, 2003-2006 (% of GDP)

Code	Economic Activity	2003	2004	2005	2006
	AGRICULTURE (A+B)	*6,0*	*5,4*	*4,8*	*4,2*
A	**Agriculture, Hunting and Forestry**	5,5	5,0	4,4	3,9
B	**Fishing**	0,5	0,4	0,3	0,3
	INDUSTRY TOTAL (C+D+E)	*24,1*	*27,5*	*29,0*	*28,5*
C	**Mining and Quarrying**	5,9	8,4	9,6	9,1
D	**Manufacturing**	14,9	15,8	16,5	16,6
E	**Electricity, Gas and Water Supply**	3,2	3,3	2,9	2,9
F	**Construction**	5,4	5,1	4,8	5,1
	SERVICE SECTOR (G+H+I+J+K+L+O+P+Q)	*54,1*	*51,2*	*49,2*	*49,7*
G	**Wholesale and Retail Trade; Repair of Motor Vehicles, Motorcycles and Personal and Household Goods**	19,6	17,8	16,7	16,8
H	**Hotels and Restaurants**	0,7	0,8	0,8	0,8
I	**Transport, Storage and Communications**	9,5	9,7	8,8	8,4
J	**Financial Intermediation**	3,0	3,0	3,4	3,7
K	**Real Estate, Renting and Business Activities**	9,5	8,3	8,5	8,5
L	**Public Administration and Defence; Compulsory Social Security**	4,9	4,7	4,4	4,6
O	**Education**	2,4	2,4	2,3	2,4
P	**Health and Social Work**	2,8	2,8	2,7	2,8
Q	**Other Community, Social and Personal Service Activities**	1,7	1,6	1,6	1,7
	FISIM	**-1,6**	**-1,8**	**-2,0**	**-2,1**
AV	**Added Value**	**88,0**	**87,3**	**85,7**	**85,4**
GDP	**Gross Domestic Product**	**100,0**	**100,0**	**100,0**	**100,0**

Note: NACE classification
Source: WIIW

Appendix 4. Employment growth by economic activities, 2003-2006

Code	Economic Activity	2003	2004	2005	2006
A	**Agriculture, Hunting and Forestry**	-5,3	-4,7	-0,7	-3,7
B	**Fishing**	-3,3	-2,6	22,1	-3,6
C	**Mining and Quarrying**	-4,4	-2,2	-3,4	-1,4
D	**Manufacturing**	-1,2	-1,2	-2,4	-2,2
E	**Electricity, Gas and Water Supply**	0,0	0,5	0,6	0,3
F	**Construction**	2,2	4,1	3,6	3,2
G	**Wholesale and Retail Trade; Repair of Motor Vehicles, Motorcycles and Personal and Household Goods**	5,8	3,6	2,3	2,0
H	**Hotels and Restaurants**	6,9	0,2	1,0	1,7
I	**Transport, Storage and Communications**	1,8	1,7	1,4	1,0
J	**Financial Intermediation**	7,8	8,3	2,8	8,2
K	**Real Estate, Renting and Business Activities**	-1,1	-0,7	1,1	1,2
L	**Public Administration and Defence; Compulsory Social Security**	4,0	5,5	0,3	3,5
O	**Education**	0,9	0,5	-1,4	-0,4
P	**Health and Social Work**	1,6	0,4	1,3	1,2
Q	**Other Community, Social and Personal Service Activities**	-1,5	1,5	5,6	1,3
TE	**Total employment**	0,6	0,6	0,6	0,3
TI	**Industry**	-1,3	-1,1	-2,1	-1,8

Source: WIIW

Appendix 5. Employment by economic activities, 2003-2006 (% of total)

Code	Economic Activity	2003	2004	2005	2006
	AGRICULTURE (A+B)	*12,0*	*11,4*	*11,3*	*10,8*
A	**Agriculture, Hunting and Forestry**	11,8	11,2	11,1	10,6
B	**Fishing**	0,2	0,2	0,2	0,2
	INDUSTRY TOTAL (C+D+E)	*22,6*	*22,2*	*21,7*	*21,2*
C	**Mining and Quarrying**	1,7	1,6	1,6	1,5
D	**Manufacturing**	18,1	17,7	17,2	16,8
E	**Electricity, Gas and Water Supply**	2,9	2,9	2,9	2,9
F	**Construction**	6,9	7,1	7,4	7,6
	SERVICE SECTOR (G+H+I+J+K+L+O+P+Q)	*58,5*	*59,2*	*59,7*	*60,4*
G	**Wholesale and Retail Trade; Repair of Motor Vehicles, Motorcycles and Personal and Household Goods**	15,9	16,3	16,6	16,9
H	**Hotels and Restaurants**	1,7	1,7	1,7	1,8
I	**Transport, Storage and Communications**	7,9	8,0	8,0	8,1
J	**Financial Intermediation**	1,2	1,3	1,3	1,4
K	**Real Estate, Renting and Business Activities**	7,4	7,3	7,3	7,4
L	**Public Administration and Defence; Compulsory Social Security**	5,0	5,2	5,2	5,3
O	**Education**	9,2	9,2	9,0	9,0
P	**Health and Social Work**	6,8	6,8	6,8	6,9
Q	**Other Community, Social and Personal Service Activities**	3,5	3,5	3,7	3,7
	TOTAL	**100,0**	**100,0**	**100,0**	**100,0**

Source: WIIW

Appendix 6. Gross investment by type of activities, 2003-2006 (% of total)

Code	Economic Activity	2003	2004	2005	2006
A	**Agriculture, hunting and forestry**	4,1	4,1	3,9	4,9
B	**Fishing**	0,1	0,1	0,1	0,1
C	**Mining and quarrying**	16,0	15,4	13,9	15,3
D	**Manufacturing**	15,6	16,4	16,4	15,8
E	**Electricity, gas and water supply**	6,6	6,9	6,8	6,1
F	**Construction**	4,9	3,5	3,6	3,5
G	**Wholesale and Retail Trade; Repair of Motor Vehicles, Motorcycles and Personal and Household Goods**	3,5	3,5	3,6	3,4
H	**Hotels and restaurants**	0,4	0,3	0,4	0,4
I	**Transport, storage and communications**	22,3	22,7	24,5	23,5
J	**Financial intermediation**	1,2	1,4	1,4	1,2
K	**Real estate, renting & business activities**	17,7	17,3	16,8	16,4
L	**Public Administration and Defence; Compulsory Social Security**	1,6	1,7	1,6	1,6
O	**Education**	1,4	1,8	1,9	2,2
P	**Health and social work**	2,0	2,5	2,6	2,7
Q	**Other Community, Social and Personal Service Activities**	2,6	2,4	2,5	2,9
	INDUSTRY	38,2	38,7	37,1	37,2
	TOTAL Investments	100,0	100,0	100,0	100,0

Source: WIIW

Appendix 7. Development of export structure by commodity groups, 1996-2005

	1995	2000	2001	2002	2003	2004	2005
Total export (million USD = 100%)	**78217**	**103093**	**99969**	**106712**	**133656**	**181600**	**241219**
including							
Food products and agricultural raw materials	1,8	1,6	1,9	2,6	2,5	1,8	1,9
Mineral products	***42,5***	***53,8***	***54,7***	***55,2***	***57,3***	***57,8***	***64,6***
Chemical products	10	7,2	7,5	6,9	6,9	6,6	6
Leather raw materials, fur and articles there of	0,4	0,3	0,2	0,3	0,2	0,2	0,1
Wood and pulp-paper products	5,6	4,3	4,4	4,6	4,2	3,9	3,4
Textile, textile articles and footwear	1,5	0,8	0,8	0,8	0,7	0,6	0,4
Metals, precious stones and articles there of	26,7	21,7	18,8	18,7	17,8	20,2	16,9
Machines, equipment and transport means	10,2	8,8	10,5	9,5	9	7,8	5,6
Other goods	1,3	1,5	1,2	1,4	1,4	1,1	1,1

Source: Federal State Statistics Service

Appendix 8. Development of export structure by commodity groups, 1996-2004

	1996	1997	1998	1999	2000	2001	2002	2003	2004
All food items (SITC 0 + 1 + 22 + 4)	1,8	1,5	1,6	1,0	1,2	1,4	2,2	2,0	1,4
Agricultural raw materials (SITC 2 - 22 - 27 - 28)	3,3	3,3	3,4	3,6	3,1	3,1	3,6	3,2	3,0
Fuels (SITC 3)	**43,1**	**45,8**	**38,0**	**41,8**	**51,3**	**53,1**	**55,5**	**53,0**	**50,2**
Ores and metals (SITC 27 + 28 + 68)	9,9	11,1	15,7	11,4	9,1	7,7	7,5	6,8	7,6
Manufactured goods (SITC 5 to 8 less 68)	**26,1**	**23,3**	**27,9**	**25,0**	**22,2**	**21,8**	**21,8**	**21,2**	**21,0**
Chemical products (SITC 5)	5,9	5,2	5,3	5,2	4,8	4,8	4,6	4,4	4,4
Other manufactured goods (SITC 6 + 8 - 68)	***13,1***	***12,8***	***15,0***	***12,9***	***11,5***	***10,7***	***10,9***	***9,9***	***11,6***
Machinery and transport equipment (SITC 7)	***7,0***	***5,3***	***7,6***	***6,9***	***5,9***	***6,3***	***6,3***	***7,0***	***5,0***
Unallocated	15,8	14,9	13,3	17,2	13,0	12,9	9,5	13,8	16,9

Note: SITC classification
Source: UNDP