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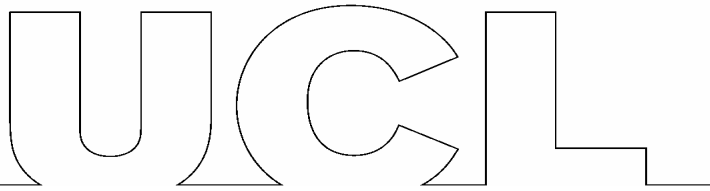

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Oil and Gas: a Blessing for Few

Hydrocarbons and Within-Region Inequality in Russia

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Oil and Gas: a Blessing for Few

Hydrocarbons and Within-Region Inequality in Russia

Tullio Buccellato* and Tomasz Mickiewicz**

Abstract:

Building on earlier work on regional inequality in Russia (Fedorov 2002; Gaddy and Ickes 2005; Bradshaw 2006 and others) we investigate a novel line of research, i.e. to demonstrate that the regional oil and gas abundance is associated with high within-region inequality. We show empirically that hydrocarbons represent one of the leading determinants of an increased gap between rich and poor in the producing regions. We discuss a possible cluster of geographic, economic and political factors underlying the phenomenon.

JEL Classification Numbers: D31, P25, R11, O18

Key Words: Inequality, Oil, Gas, Regions, Russia, State Capture

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Oil and Gas: a Blessing for Few

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1) Introduction

Russian transition from the command economy has been one of the most arduous among those experienced in Central and Eastern Europe. In the early 1990s, the country passed through a period characterised by a collapse in output accompanied by hyperinflation, induced by partial liberalisation combined with dysfunctional macroeconomic policy and with administrative difficulties associated with the disintegration of the Soviet Union and with the rebuilding of Russian statehood. Macroeconomic instability continued until 1998 when the low level of tax revenues and massive emission of public debt in the form of short term bonds (GKOs) took a form of Ponzi game and led to the combined exchange rate, fiscal and financial crisis of August 1998 (Gross and Steinherr, 1995; Åslund, 2002; Mickiewicz, 2005; Havrylyshyn, 2006 and others).

Since 1999 Russia has started a sharp and long lasting recovery. The new increase in international oil prices coupled with more appropriate exchange rate levels that have made exports profitable has ensured an average annual rate of growth of over 6%. Nonetheless, growth in GDP has gone along with continued high levels of inequality[1]. Russia is now characterised by more dramatic social differences than most of the other transition economies. The inequality has stabilised at a level comparable to some Latin American countries, like Venezuela, African economies like Nigeria and Middle Eastern ones like Iran (all net oil exporters). Among possible causal factors, hydrocarbons revenues seem to have played an important role in affecting the heterogeneity of incomes across the population. Oil and gas, as with other natural resources, represent an easily appropriable and excludible source of wealth. The privileged, who have gained access to oil and gas revenues, have enjoyed a disproportionate increase in their living standards enlarging the gap with the rest of the population.

In this paper, we investigate the hypothesis that the natural resources led growth could be associated not only with the widening in differences of living standards across Russian regions but also within regions. In particular, we demonstrate that regions rich in oil are characterised by a higher level of income inequality. We also discuss possible geographic, economic and political explanations for this phenomenon.

[1] Over the period 2000-2006 the income-based Gini index had remained at the level of 0.40-0.41 (Source: *Goskomstat*). See also: Svedberg *et al.* (2006).

We argue that some theoretical intuitions drawn from cross-country comparisons may also apply to the cross-regional comparisons, given the geographical, economic and social diversity and the federal character of Russia.[2] In particular, some of the theoretical explanations linking the presence of subsoil hydrocarbons with differences in within-country inequality may also apply to differences in within-region inequality. In the economic literature, the role of oil, gas, and - more generally - of natural resources has been broadly discussed as having an ambiguous impact on economic prosperity, development and long run growth (Corden and Neary 1982, Eastwood and Venables 1982, Corden 1984, Sachs and Warner 2001, *et al.*). While, positive effects of natural resource endowment on growth are likely (Sala-i-Martin *et al.*, 2004), this may not always be the case, and more importantly the gains from growth may not be equally shared. There are several factors that may be inducing the latter phenomenon. Boom in the hydrocarbons sector may affect other sectors negatively, including the shift of investments towards traded natural resources and non-tradable sectors preventing diversified economic growth. High concentration of rents in the hydrocarbons sector, where not counterbalanced by efficient government policy, may result in a skewed distribution of income.[3] In addition, natural resource abundance may fuel corruption (Leite and Weidmann 1999) leading to a dysfunctional business environment. Hydrocarbons trade can stimulate rent-seeking behaviour that, together with highly concentrated bureaucratic power, induces corruption in the economy and hence, lowers the quality of institutions. The latter may enhance income inequality via its negative effect on entrepreneurial entry (see also Gylfason and Zoega, 2002). This strand of the literature demonstrates that focus on the link between natural resource endowment and inequality is important not only because the question itself matters, but also because inequality may have implications for other aspects of economic development, including poverty.[4]

In this paper we are interested to which degree some of these country level phenomena are applicable to the regions of Russia. Thus, we focus on the local effects of oil and gas, that is, we investigate if their presence results in a less equal income distribution within the Russian regions. We achieve this aim by an empirical analysis. We establish that the link between oil and inequality as seen in the cross-country perspective has its counterpart in a similar link detectable in Russia.

Economic transition in Russia has caused shifts in allocation of wealth and resources both across regions (*between*) and among their population (*within*). The former aspect of inequality was investigated by Fedorov (2002), Bradshaw and Vartapetov (2003) and others. Here, we focus on the determinants of the latter, that is, on the factors affecting *within*-

[2] Popov (2001) makes a similar argument.
[3] Also, given the international volatility of resource prices, the resource-based economy may ultimately be likely to suffer seriously in the case of price shocks (Sachs and Warner 2001).
[4] On the impact of inequality on poverty in Russia, in regional perspective, see Kolenikov and Shorrocks (2005). However, due to data limitations their estimations are based on one year only.

region dimension of inequality, dividing the regional populations into five income quintiles and using the shares in income of each of those in our analysis. We find oil and gas play a prominent and significant role in the process of wealth redistribution and accumulation *within* the Russian regions.

The next section summarises briefly some relevant literature concerning the issues of inequality and hydrocarbons resources, mainly referring to the Russian post-transitional experience. In section 3 we move towards the econometric analysis and present the dataset used, variables included and results obtained. Concluding remarks follow.

2) Literature Review and Motivation: Hydrocarbons and Inequality in Russia

Oil and gas played an important part in Russian economic performance far before the beginning of transition. Hydrocarbons were a primary source of economic prosperity for the Soviet Union since the 1917 revolution. Oil production was already at a level of approximately 25 million barrels by 1920, and in the year 1987/88 it peaked at 4.5 billion barrels, making the USSR the largest oil producer in the world. However, the early 1990s were characterised by a marked inefficiency in oil management in Russia. As a result of that, but also of the separation of some oil producing former Soviet republics, production dropped back to third place among oil producers, behind Saudi Arabia and United States (Considine and Kerr, 2002).

It is more controversial to assess how much inequality there was in the Soviet era and to what extent it was linked to the natural resource endowment. Generally, during Soviet times, a very small share of incomes was derived from rents officially, as private property of natural resources and capital was almost non-existent (Milanovic, 1998). On the one hand, this limited the impact of natural resources on inequality, on the other, the lack of private ownership rights facilitated enormous transfers of wealth from the extracting regions to the population centres in the European part of the country. Commander *et al.* (1999) argue that Russia entered the transition period already with a significantly high level of inequality, which has then further increased as a result of the wealth transfers realised through the privatisation (especially in the energy sector), the changes in government expenditure and the growth in earnings dispersion.

2.1 Between-region inequality in Russia

Below, we discuss briefly some of the key contributions on between-region inequality and polarisation in Russia[5]. Next, we will turn to the *within* dimension concerning the heterogeneous impact of oil and gas on income groups within the regions that has not been explored much in the existing literature.

Regional inequality across Russian regions may be explained using an array of factors. Fedorov (2002) considers polarisation between Western and Eastern regions, specificity of the national republics and ethnic Russian *oblasts*, urbanised versus rural areas, and finally the role of export-orientation and economic openness of the regions. Using a dataset provided by Goskomstat Rosii, Fedorov (2002) carries a multidimensional analysis of inequality across Russian regions over the period 1990-99. He confirms a continuous increase of inequality over the period 1991-96. After 1996 the upward inequality trend became less steep and even reversed slightly in 1998. He establishes that between-regional differences were increasing due to the fact that both urbanised and exporter regions have grown faster with comparison to closed rural areas.

However, given the structure of Russian exports, exporting is the dimension which is closely related to the natural resource endowment. The share of hydrocarbons in total exports started from a level of 32% in 1998 and constantly increased until 49.2% in 2003 (Gurvich, 2004). Its share in merchandise exports reached over 60% in 2006 (Hanson, 2007; see also OECD, 2006). Also the ratio of hydrocarbons exports to GDP has been very high: it ranged from 10.4% in 1998 to 17.1% in 2003. These figures are probably underestimated. The World Bank (2004) states that a consistent part of gas and oil revenues are misattributed to wholesale trade in order to escape taxation (see also: Bradshaw 2006).

Bradshaw and Vartapetov (2003) confirm that inequality assumes a strong geographic connotation, with poorly performing regions facing problems in ensuring minimum living standards. Such a situation could be alleviated by the intervention of the central state administration smoothing the differences. However, state intervention has been insufficient. The allocation of federal assistance funds had not been based on clear principles, which has left the doors open to the development of a system of lobbying activities. In particular, the introduction of the Fund for Financial Support of the Regions (FFSR) in the mid 1990s has indeed failed to alleviate the spatial dimension of inequality. During the 1990s, the lack of economic and social logic in fiscal transfers between the federal government and the regions resulted from the chaotic nature of *ad hoc* compromises between the federal government and the regions, with national republics (such as Tatarstan, Bashkortostan and Yakutia) being the key winners (Hahn, 2005; Yenikeyeff, 2008; see also: Treisman, 1998).

[5] For the discussion on the differences between the concepts of regional inequality and regional polarisation, see Fedorov (2002).

Using data provided by Goskomstat Rosii, Bradshaw and Vartapetov (2003) find for 1990-2001 that standard deviation in income falls sharply as one drops from the sample the city of Moscow, the region of Tyumen (richest regions) and Ingushetia (the poorest). Similarly, for consumption, there was an increase in inequality led by prosperous regions such as Moscow, Samara, Tyumen, Perm and Lipetsk. In contrast, the spatial distribution of social and infrastructure indicators remained more equal.

Starting with the discussion of Russia in terms of the resource based economy, Bradshaw (2006) discusses the role of the production of oil and gas and its regional aspects. Already during the Soviet era, natural resource rents were diverted from the oil and gas producing regions towards the European part of the Soviet Union. The implementation of this redistribution process was realised through the imposition of low prices on natural capital and high prices on machine capital. The hard currency inflows generated by the trade of natural resources were concentrated in the capital Moscow, to be then allocated strategically to the military industrial complex and to be used in exchange for grain and western technologies to compensate for the failings of domestic agriculture and innovation processes correspondingly.

On the other hand, in the producing regions, the development of oil and gas was implemented "at the expense of socio-economic infrastructure, not to speak of the environment, resulting in an extremely lopsided regional economy" (Glatter, 2003, p.402).

More importantly, a similar mechanism of regional relocation of rents can be detected after the transition, both by use of transfer pricing and through the taxation mechanism, where revenues are not channelled back to the regions of origin: "the transfers involved are far more significant than any equalization payments through the fiscal federal structure" (Bradshaw, 2006, p. 742).

Gaddy and Ickes (2005) explore the network of informal rent sharing, which developed around the hydrocarbons production and trade. There is no exact information on the true value of hydrocarbon rents and on the way they are redistributed. Both during the Soviet Era and after the transition to market economy, one of the main characteristics of value distribution has been non-transparency. An important channel of informal rent sharing is represented by corruption, which is taking the form of a tax system parallel to the official one. Furthermore, the constant and wide gap between the domestic and international price of natural resources has contributed to the development of a complex price subsidies system. Companies also distort extraction cost to avoid formal taxation and use various forms of transfer prices to channel wealth away from where it could be taxed at source. Until the early 2000s, the oil companies were also highly effective in influencing the tax law for their benefit (Fortescue, 2006; Yenikeyeff, 2008).

Spatial dimension plays a major role in enhancing inequality in Russia. In general, among transition economies the territorial extension has been found to be positively correlated with the level of inequality (Gerry and Mickiewicz 2008;

see also Bradshaw 2006). The larger the extension of a country, the higher the impact of regionally specific effects on income distribution. Thus, it is not surprising that in Russia the regional patterns of GDP per capita diverged dramatically from the beginning of the 1990s (see also: Buccellato 2007).

2.2. Within-region inequality: rent seeking and political corruption

We now turn to the within-region dimension of inequality paying particular attention to the role of oil and gas. According to Svedberg *et al.* (2006), within-region inequality dominates the between-regional dimension and average indicators, as captured on the regional level, often mask significant inequality on the lower level. For instance, the Tyumen region, which hosts much of the oil and gas administration has a low average poverty rate (12%). Yet, in its Southern, rural part, the poverty rate increases to 18% (UNDP, 2007).

As discussed above, in the cross-country context, it has been found that large endowments of natural resources tend to go hand in hand with rent seeking behaviour. The natural resource sector is usually protected by huge barriers to entry, which leads to the strong position of producers. Furthermore, natural resources are usually found in isolated, unfriendly places, where distortions of political structures are likely and the rule of law may be poor. In the Russian case, during the Soviet era, entire cities were constructed to provide housing for workers in natural resource extraction in isolated areas of the west Siberian regions as well as in the Far East (Kronenberg 2004). This is precisely where some of the more authoritarian local structures developed after the collapse of the Soviet Union (Gel'man, 1999). The power struggle was typically limited to a few key players within the local oligarchy, and after the initial wave of democratisation in the early 1990s, the position of members of the political elite was increasingly defined by their relation to productive assets in the hydrocarbons sector (Glatter, 2003)[6]. As documented by Glatter (2003) for the Tyumen Regional Duma, in 1990-1993, 23% of seats were taken by employees and workers, 23% by professionals, 29% by economic leaders and middle level managers and 10% by administration officials. By 1997-2001, the representation of the first two groups fell to zero, and the representation of "economic leaders" increased to 40% and of local administration to 20%. Representation of big business in local institutions was also typical for other regions (Sakwa, 2008), however, in the context of our discussion, the key issue here is that the concentrated wealth generated in the oil and gas sector made it particularly easy for the businessmen to capture the local government.

The recentralisation programme implemented in Russia in the early 2000s led to the loss of influence of regional leaders on the federal level, but in exchange, those local elites that were co-opted by Kremlin consolidated their position on the local level. "As Russian critics of the [recentralisation] plan have pointed out, only partly facetiously, there are not

[6] A well-publicised case of an oil oligarch who became a governor of one of the Russian regions (Chukotka) was that of Mr. Roman Abramovich, who was also one of the two controlling shareholders of Sibneft (with Boris Berezovsky), before the sale of the company to Gazprom in September 2005.

enough KGB operatives from 1980s Leningrad to fill 89 top posts. (…) Putin has ceded to regional leaders much leeway to run their regions as they see fit." (Slider, 2005, pp. 183-184; see also Yenikeyeff, 2008). As noticed by Svedberg *et al.* (2006), "Since September 2004 new gubernatorial appointments were made in 35 regions. In most cases, the governors have been appointed for a third or even fourth term, meaning that the new scheme has allowed them to bypass the two-term limit that existed under the previous system." (*Ibid.*, p. 10). This pattern implies more stability in the local political and economic structures of power and their increasingly undemocratic character.

To summarise the argument, we posit that local economic structures dominated by oil rents endowed business elites with enormous resources for state capture and for the corresponding distortion of democratic processes. In turn, that enabled big business to protect its economic interests. The only change in 2000s was that the economic power was typically consolidated at the hands of federal corporate groups at cost of the regional corporate groups, many of which lost their autonomy (Yenikeyeff, 2008). Evidence provided by Svedberg *et al.* (2006) shows that Khanty-Mansi Autonomous Okrug, which is the main centre of the Russian oil industry, takes fourth place on the regional list of state capture[7], and the neighbouring Tyumen, where the oil and gas administration offices are located, takes the first place. Tyumen moved up to the top of the list in 2003, from a relatively low position in the mid 1990s.

One of the key channels through which state capture affects income distribution is through its detrimental effects on entry and entrepreneurship. Preferential treatment of big players crowds out new entrants while (i) entrepreneurship could play a critical role as an escape route out of low-income/poverty traps (Berkovitz and Jackson, 2006) and (ii) demand for labour and wage competition from new big entrants could have positive effects on incomes. Low entry coupled with a trend towards recentralisation is also very typical for the oil and gas industry in 2000s (Kryukov and Tokarev, 2007). The negative association between entry and state capture for Russian regions is documented by Yakovlev and Zhuravskaya (2004).

Obviously, the local political elites dominated by big business may opt for social support programmes, as the latter are beneficial from the point of view of social and political stability, yet only to the extent to which their share in hydrocarbons rents remains protected.

In general, income distribution is shaped by the way the political process modifies primary economic distribution. Accordingly, the link between authoritarian political structures and skewed income distribution documented for transition economies in cross country perspective by Gerry and Mickiewicz (2008) is likely to be found in the regional Russian perspective.

[7] State capture is measured by preferential treatment obtained by firms and defined by "tax breaks, investment credits, subsidies, subsidised loans, loans with a regional budget guarantee, official delays in tax payments, subsidised licencing free grants of state property, and special "open economic zone" status. (Svedberg *et al.*, 2006). The results discussed here are based on an earlier empirical study by Yakovlev and Zhuravskaya (2004).

2.3. Within-region inequality: labour market effects

The political argument links with the economic one. Russia has inherited a very concentrated industrial apparatus from the Soviet period. A difficult, protracted and painful process of reallocation of labour from obsolete industries to more profitable new ones followed. In particular, the Stalinist central planned system implied the allocation of blue collar workers and engineers in isolated mono-structural regions. In sharp contrast, the transition brought more dynamism into the metropolitan areas. Crucially, the scarce inter-regional labour mobility coupled with regional protectionist policies impeded a natural process of arbitrage, making the regional factor endowment predominant in shaping wage disparities. The competition in some sectors remained inadequate, especially where privatisation was not coupled with new entry, and the local structures were dominated by one sector, hydrocarbons in particular (see for ex. Glatter, 2003). This situation led to forms of local monopsony in the labour market (Svedberg *et al.*, 2006; Bignebat 2003). With respect to oil and gas industry, the process of concentration and increasing entry barriers led to the spatial segmentation of production, where different companies enjoyed quasi-monopolies within their respective territory of operation in 2000s (Kryukov and Tokarev, 2007). Oil companies enjoy a monopsony position in recruiting labour, placing workers in a condition of dependency and weak bargaining power. This is an important factor which helps to explain why the local population is not sharing in the rents generated by the extracting industry as a result of direct, primary income distribution. In general, monopsony power leads to the persistence of wage differentials representing an important component of inequality (Bignebat 2003; Kislitsyna, 2003). The factors contributing to this situation include low mobility of labour within the Russian borders, due to the high cost of migration (including administrative costs), lack of financial liquidity amongst workers and underdeveloped housing markets. In addition, local large firms provide fringe benefits and in-kind payments, which can "be explained as an attachment strategy of firms: paying wages in non-monetary forms makes it hard for workers to raise the cash needed for leaving the firm/region." (Svedberg *et al.*, 2006, p.14-15). Low mobility affects also high-skilled workers, and as a result, the regional labour market may exhibit characteristics of the segmented labour markets, where the shortage of high-skilled workers coupled with the abundance of low-skilled workers leads to wage inequality (Svedberg *et al.*, 2006). Given the technological characteristics of the oil and gas industry and its organisational structures that emerged from the process of consolidation in 2000s, local outcomes of this nature are likely.

To shed some further light on the monopsony issue we carry out a comparison between two of the most important Russian companies - Gazprom and Rostelecom, both operating in sectors characterised by large rents (hydrocarbons and telecommunication). Controlling more than 60% of Russian gas reserves and 84.7% of the national gas production,

Gazprom alone now accounts for 10.6% of Russian GNP (source: Gazprom in figures 2002-2006 and Gazprom's Financial Reports). Rostelecom is the country's leading fixed-line telecommunications company, one of the biggest telecommunication companies in Russia and operates nationwide with a network reaching approximately 200,000 kilometres in length (Source: Rostelecom's Financial Reports).

Based on the Financial Statements of the two companies over the period 2002-2006, it clearly emerges that the share of profits in value-added as compared with the corresponding share of wages is much higher in Gazprom. In the case of Rostelecom the wages cost is always higher than the amount of gross profits. That amounts to a striking inter-sectoral difference, which is further reinforced by the differences in the internal composition of wage expenses, i.e. the share of the remuneration of senior management and directors in the total amount of wages and salaries. Over the period 2002-2006 this share ranged from 0.6 to around 2.4% for Rostelecom and from around 10% to approximately 13% for Gazprom, implying a much lower share of workers in comparison with the management apparatus in value-added in the hydrocarbons sector (*Figure 1*).

{Figure 1 about here}

2.4. Redistribution

Disparities generated in the labour market could be offset by redistribution through the tax system and government expenditure. Due to the general increase of international hydrocarbon prices, revenues from custom duties have strongly increased in early 2000s and as a result their share in total revenues went up from 7.1% in 1999 to 15.8% in 2004 (Ellman, 2006). While oil price growth amounted to 191% between 2002 and 2007, the corresponding growth in custom duty was 982%. A parallel growth in tax on mineral production between 2002 and 2007 amounted to 353% (Kryukov and Tokarev, 2007). Hydrocarbon revenues have been targeted for the creation of the so-called stabilisation fund, set up to prevent a new financial crisis similar to the one experienced in August 1998. In January 2006 the stabilisation fund reached the amount of 1,459.1 billion Rubles (Ellman, 2006, p.41-43). DeBardeleben (2003) considers the balance of financial flows between the regions and the centre (i.e., difference between the total amount of tax revenues collected in the regions and expenditure of the regional government) in four different regions (Stavropol'skii *krai,* Orlovskaya *oblast*, Nizhegorodskaya *oblast* and Khanty-Mansiiskii *avtonomnyi okrug)* over the period 1996-1998. The region of Khanty-Mansiiskii *avtonomnyi okrug*, which is the main centre of the Russian oil industry, contributes far more to the federal budget than the three remaining regions. However, despite the relevant amount of tax revenues generated by the hydrocarbons sector, it is not clear how they are redistributed, especially across regions. Performing a simple OLS regression with robust standard errors on a cross-section of 87 Russian regions for the year 2005, we find an

insignificant negative (sic!) relation between average monthly transfers to households per capita and percentage of people living under the poverty threshold (*Figure2)*. Due to a possible problem of endogeneity deriving from the use of two variables that are simultaneously determined, we also computed a Bonferroni-adjusted index of correlation, which does not imply any direction of causality. We found an insignificant negative correlation in the order of -0.1431. These results seem to suggest that the fiscal transfers are not targeting the poor, and are therefore not decisive in reducing the gap separating the richest and the poorest, which is likely to be the highest in hydrocarbons producing regions due to the economic and political factors discussed above.

{Figure 2 about here}

To summarise, we posit the following. The distribution of income both between and within regions is strongly affected by the rents generated by hydrocarbons extraction and trade, which are supported by the economic and political structures. The distributional effects are partly driven by the technological characteristics of the extraction processes, where capital-intensive firms create pockets of limited numbers of well-paid jobs. However, they are enhanced by the monopsonistic position of these companies against both the bulk of their workers and the local labour force, from which the employees are drawn. The strong local position of these companies is protected by the dominant position of the key big business players in the political structures.

In addition, a significant part of resource rents is transferred away from the extraction region, leaving less to be shared directly with local communities. This would not be a problem *per se*, and could even be welcomed if the federal spending would compensate for the local distortions. However, existing evidence demonstrates that while the government share in the oil and gas rents has been on the increase, it has not been accompanied by well-targeted social transfers, which would return back to the communities some of the wealth from the actual physical resources in their neighbourhood. Taking all these factors together, we can explain the paradox, which is that the regions where the oil resources are located, are also characterised by the more extreme social contrasts.

The literature provides *cross-country* evidence that oil and gas endowment is associated with an increase in inequality, and the same factor may play a significant role in the *cross-regional* perspective for Russia. Accordingly, we intend to establish empirically if, in addition to the *between* regions dimension of hydrocarbons-driven inequality in Russia, we also see an increase in inequality within the regions of extraction. In the next section we introduce the empirical methodology we wish to implement for this purpose.

3) Hydrocarbons and Inequality in the Russian Regions

3.1 Measuring Inequality between and within Russian Regions

In most of the studies, inequality refers to disparities in income. Inequality is, however, a multidimensional concept. It includes a much wider range of aspects, such as wealth, consumption, access to health, education and other public services. However, any empirical analysis is always limited by the availability of data and in our study we use the broadest and the most used concept of inequality, that is the one concerning divergence in income levels. Relying on it, we first construct a bi-dimensional measure of inequality *between* and *within* regions to demonstrate the role of oil and gas. For this purpose, we utilise the Theil Statistic, which is being increasingly used in economic literature. Theil's T statistic can be easily constructed with just two bits of information, that in the case of Russian federation are: the share of each region's population in the Russian population and the ratio of the average regional income to the average income in the country. Correspondingly, the formula is:

$$Theil = \frac{\mathrm{Re}gion\_Population}{Total\_Population} \times \frac{Average\_\mathrm{Re}gional\_Income}{Average\_Country\_Income} \times \ln\left(\frac{Average\_\mathrm{Re}gional\_Income}{Average\_National\_Income}\right)$$

Theil's measure of inequality we derived is capturing the spatial component of inequality, stating how large is the contribution of each individual region to the total amount of the *between* inequality in the Russian federation. *Figure 3* below shows how important is the role played by the west Siberian region (two autonomous administrative entities of Chanty-Mansijskij Autounomous Okrug and Jamalo Nenetskij Autonomous Okrug, both in the Tyumen region), which is the one from which approximately one half of the total amount of hydrocarbons produced in Russia originates. The administrative organisation of the Tyumen area is deeply connected with the distribution of natural resources and with the economic structure of their production. The Chanty-Mansijskij Autounomous Okrug represents the main centre of the Russian Oil industry, while Jamalo Nenetskij Autonomous Okrug is the area where the highest share of gas production takes place. The remaining portion of the territory is the 'proper' Tyumenskaya Oblast, mainly consisting of the town Tyumen (the capital) and playing the complementary role of onward hydrocarbons transmission and strategic basis of oil and gas administration offices (Glatter 2003). Galbraith *et al.* (2004) argues that the prominent contribution of the Tyumen region to Russia between inequality reflects the advantage of export oriented areas with respect to other regions in attracting strong currency revenues and of urban entities with developed systems of services. However, we demonstrate below that also when controlling for the general amount of exports and the share of services, oil and gas still continue to play an important role in explaining inequality.

{Figure 3 about here}

3.2 Within-Region Inequality: Data, Model Specifications and Methodology

Goskomstat Rossii provides data at the regional level for the annual share of income acquired by each quintile of the population. Data is available for the period 2000-2004. Our measure of inequality can now be computed alternatively either as a share acquired by the top (bottom) quintile or the difference between the share of income owned by the richest quintile of the population in each of the regions and the shares of the remaining four quintiles of the population, separately considered.

Over the period 2000-2004 we can rely on a complete balanced panel for 86 Russian regions. To avoid double counting, where both regional level data and sub-regional level data (like autonomous regions) are reported, we use the residuals obtained from subtracting the reported lower level units from the higher level regional units (for example, we use a residual obtained by deducting the figures for Chanty-Mansijskij Autounomous Okrug and Jamalo Nenetskij Autonomous Okrug from the figures provided for the whole Tyumen region, instead of using the latter).We also have to drop the Chechen Republic because of the lack of data for this war-tormented region. The other observation dropped from the analysis is the capital Moscow, which is an outlier and presents specific characteristics not comparable with the rest of the Russian Federation.[8]

One further remark is necessary. The quality of data at a regional level raises questions and hence the reliability of regional datasets is often considered problematic. In the case of the Russian federation, Goskomstat Rossii provides data as collected by the local authorities. Solanko (2003) raises doubts about the precision of regional data collection in Russia. Yemtsov (2003) also raises the possibility of inconsistencies between national and regional methodologies of producing data, preventing for example disaggregation of national data into regional components. However, the methodology used by *Goskomstat* has constantly improved and has been standardised getting closer to international benchmark over time and the period we consider is relatively recent. While recognising the possible drawbacks in using *Goskomstat* data, it is the only complete dataset that can be used for our purposes.

As dependent variables we first use the percentage shares of income for each regional population quintile. In particular, the share of income of the richest 20% is an important indicator of income distribution (see for instance Reuveny and Li, 2003). As our robustness check, we also utilise the differences between the percentage shares of highest income

[8] We run our models both without Moscow and with Moscow dummy variable. There is little difference between the results. All are available on request.

quintile of the population and the corresponding shares of the lower quintiles. All are computed at the regional level, that is, they capture the within-region inequality.

We consider the production of oil and gas tonnes standardised by the number of people living in each region **(P_OIL&GAS)** as the core variable for our analysis.

To reinforce our results, we introduce some control variables that have been shown in the economic literature as playing an important role in affecting both income growth and distribution across individuals and spatial entities. We end up by considering five control variables.

First, differences in wages and hence income inequality can be explained as a consequence of the heterogeneous distribution of human capital across people and space. Lukyanova (2006) concludes that inequality becomes more severe where the share of low educated workers is higher. However, the relation between inequality and investment in human capital is documented as ambiguous in the economic literature (Aghion *et al.*, 1999). Despite the uncertainty related to the long-run impact of investment in human capital on inequality, the link between these two variables has been widely discussed and we introduce the corresponding variable using a proxy (**ENROLLMENT_RATE**). This variable represents the percentage of children enrolled in primary school out of the population of children at the corresponding age.

Furthermore, we introduce two other control variables. The first is the logarithm of the regional GDP **(l_RGDP)**. After Kuznets (1955; 1963) revealed the inverted U-shaped relationship between the two variables, there have been numerous studies testing the link. If the debate about the direction by which one variable affects the other remains still open, the emerging consensus in the recent literature is that income and inequality seem to vary endogenously (Lundberg and Squire, 2003). In order to alleviate the problem we will make use of the System GMM econometric methodology, which has been proved to be robust with respect to the endogeneity across variables.

In addition, we control the natural logarithm of total exports denominated in dollars **(l_EXPORT)**. After the 1998 financial crises and the consequent strong devaluation of the rouble, the increase in inequality has been affected by the polarisation between regions with access to international trade and those that relied on internal market economic activities. The gap has increased especially when goods have been produced at costs denominated in roubles and sold at hard currency prices on the international markets. Galbraith *et al.* (2004) conclude that relative income rose more sharply in regions enjoying hard currency export earnings. However, this increase in income was not necessarily shared

evenly by the local population, which could lead to higher *within* inequality. Controlling for exports is important, otherwise testing of our hypothesis on the impact of hydrocarbons could suffer from omission of a related variable creating a bias.

The results of Fedorov (2002) suggest that together with export, the degree of urbanisation has played a very important role in enhancing disparities across regions. Such a result can be explained by the existence of more developed services sectors in regions with higher degrees of urbanisation. People working in new privatised services usually benefit from higher wages with respect to workers in manufacturing industries and especially to low-skilled labour in rural areas. Hence, we include also the share of services in total production **(SERV)** as our explanatory variable for the *within*-region dimension of inequality.

Summarising, we end up with the following two main specifications. The first one is where the dependent variables are the shares in regional income of the five quintiles of the regional population. The second relates to the differences between the shares of the top quintile and the lower ones. That is we have:

$$Qunt\_j-th = \alpha_1 + \alpha_2(\text{P\_OIL \& GAS})_{i,t} + \alpha_3(\text{ENROLMENT\_RATE})_{i,t} + \alpha_4(\text{l\_RGDP})_{i,t} + \alpha_5(\text{l}\_EXPORT)_{i,t} + \alpha_6(SERV)_{i,t} + \varepsilon_{i,t} \quad (1)$$

$$Dist\_5-th\_j-th = \alpha_1 + \alpha_2(\text{P\_OIL \& GAS})_{i,t} + \alpha_3(\text{ENROLMENT\_RATE})_{i,t} + \alpha_4(\text{l\_RGDP})_{i,t} + \alpha_5(\text{l}\_EXPORT)_{i,t} + \alpha_6(SERV)_{i,t} + \varepsilon_{i,t} \quad (2)$$

where *i* represents a region, *t* a year and *j* the income quintile (1-5). *Qunt_j-th* relates to the share in income of the corresponding quintile. $Dist\_5-th\_j-th$ relates to the four differences of percentage GDP share between the fifth percentile and each of the remaining lower four income groups (with *j*=1,2,3,4) . For the five years considered we can rely on a complete balanced panel for 86 Russian regions.

We now discuss the choice of the appropriate methodology to obtain estimates of the models presented above. Implementing fixed effect panel data estimator would allow us to control for regional specific effects unlike the standard OLS cross-sectional regressions. However, the fixed effects estimator could fail in controlling for possible

endogeneity of at least some of the explanatory variables considered (ENROLMENT_RATE and l_RGDP for example). We can address the problem with instrumenting the right hand side variables with their lagged values. This procedure has been first implemented through a GMM estimator by Arellano and Bond (1991). Recently however, the issue of possible persistence in the dependent variable that leads to a downwards bias in Arellano-Bond estimator has been highlighted (see for instance Hayakawa, 2007). Hence, we end up by choosing the *System GMM* methodology as introduced by Arellano and Bover (1995) and Blundell and Bond (1998; 2000). Making use of a wider set of instruments, this method has been proven to result in greater precision for the estimates of autoregressive parameters as it combines the difference estimator of Arellano-Bond (1991) and the level estimator of Arellano-Bover (1995), for which corresponding biases work in opposite directions (downwards in the former, upwards in the latter) and the weights adjust the final estimation for the relative difference of the magnitudes of the biases. This is particularly important in the presence of persistent series (Hayakawa, 2007), especially when the time span of the data is small as it is in our case. In addition, with *System GMM*, we also apply the robust standard errors, implying a further improvement in the quality of our estimations.

In addition to our preferred models, we also present results obtained by testing for alternative dependent variables using the same benchmark model as specified in equation (1). In particular we use (a), the Gini index **(GINI)**, (b) the coefficient of differentiation in income between the richest 10% and the poorest 10% of the population **(Coeff_Diff_Income)** and (c) the Theil statistic (calculated using the formula as depicted in Section 3.1 above based on data on regional GDP and population as provided by *Goskomstat*) **(THEIL)**. If the first two measures have been discussed already, something could be told about the third proxy for inequality. Data for this variable are provided by *Goskomstat* together with the Gini Index and we use it just as an alternative measure of the gap between poorest and richest percentile of the population. However, for the Gini index and the coefficient of differentiation in income we only have three years (2003-2005) available and this prevents us from applying the dynamic panel data specifications. For such a short span of time we apply so called *between effects* estimator, based on three years averages of all the variables included in the model.

3.3. Results

Our main hypothesis relates to the hydrocarbons as a factor enhancing within-regional inequality. All our specifications confirm the important role of oil and gas production in enhancing divergence and inequality within regions.

We start with presenting results obtained with the percentage shares of each quintiles of the population as the dependent variables and implementing the *System GMM* methodology (*Table 1*). It turns out clearly that oil and gas

(P_OIL&GAS) tend to enrich the highest quintile of the population most; in contrast, for all the remaining four quintiles of the population the variable exhibits a negative relation with the correspondent share of wealth. The effect of the variable representing the hydrocarbons production is also robust to the introduction of additional control variables such as the logarithm of regional GDP **(l_RGDP)** and the logarithm of the amount of exports **(l_EXPORT)**. Interestingly, the gains from export are more widely shared. On the other hand, the share of services in total regional production **(SERV)** seem to benefit the richest percentile of the population most, a result that could be linked to the presence of entry barriers.

{Table1 about here}

We move next to the analysis based on the gaps between the share of wealth owned by the richest quintile and the remaining four quintiles individually taken (*Table 2*). As this is a more restrictive test of our hypotheses, the services indicator is no longer significant, but the key variable which remains very significant in exacerbating differences across different quintiles is oil and gas. We should also emphasise that for both models, all the tests seem to confirm validity of specification: the lag of the dependent variable is always very significant, the autocorrelation of the first order is always significant but, importantly, the second order autocorrelation is in contrast never detected, and the over-identifying restriction test always provides good results.

{Table 2 about here}

Finally, in *Table 3* we present results obtained with three additional dependent variables as proxies for inequality implementing the *between effect* regression. The three columns of the table reports results for (1) the Gini index, (2) the coefficient of differentiation in income between the richest 10% and the poorest 10% of the population and (3) the Theil't statistic, respectively. The only variable which exhibits a positive and highly significant impact on inequality is again the hydrocarbons production. Services and the regional output are found to have a positive and significant impact on inequality in two out of three specifications. The enrolment rate and exports lose their explanatory power.

{Table 3 about h**ere**}

4) Concluding remarks

Russia is the largest country on earth (11.5% of its surface, 17,075,200 km^2, 6,591,027 mi^2), almost twice as large as Canada, US and China, and more than twice as large as Brazil and Australia. Despite the recent recentralisation drive, its geographical diversity is still matched by institutional, economic and social diversity. It is for this reason that some of the theoretical tools developed to understand cross-country variation may be applied to analyse variation on the regional level in Russia (Popov, 2001), and this is what we do.

We focus on hydrocarbons endowment and argue that the regularities observed on the cross-country level apply to Russian regions as well. In the novel perspective, we test empirically the determinants of intra-regional inequality in Russia, applying robust dynamic panel data estimators. We find that regions, where oil and gas is produced tend to experience higher levels of income inequality in striking resemblance to cross-country results.

Why do our findings matter? Inequality is not the same as poverty, albeit Kolenikov and Shorrocks (2005) documented that along the low level of income, inequality is also an important determinant of poverty in Russia. In the hydrocarbons perspective, these two factors work in the opposite direction, as the oil- and gas- rich regions are characterised by higher average incomes, even if to a large extent the latter mask important intra-regional disparities. This is well understood in Russia, and one can also see government initiatives address some of the problems, examples of which include a 'self-sufficiency' target programme launched in Tyumen Region in 2007 (UNDP, 2007). More could be done in this respect. Russia has accumulated $70.7 billion in the form of the stabilisation fund, representing around 7.1% of the GDP (October 2006). The fund was originally created to protect the state budget against oil-price fluctuations. Given its rapid growth over time the stabilisation fund may soon be used beyond its proper mandate of "fiscal insurance" (OECD, 2006). It seems to us however, that the efficient solution would require tackling the problems at their roots. We argue, that in striking resemblance to country-level analysis, hydrocarbons rents provide big business with concentrated wealth which has been used to derail the democratic processes initiated in Russia in early 1990s. Glatter (2003) provides a striking example of how this mechanism had operated at the local level and resulted in a high level of integration between the local oil industry and local political elites achieved by early 2000s. It seems that recent recentralisation drive changes the local balance of power, with a shift from regional corporate groups to federal corporate groups and a stronger position of the federal government (Yenikeef, 2008). However, while the local elites co-opted by the federal administration give up their ambitions at the federal level and help the president and the ruling party to achieve the expected elections results at the local level, they are becoming more protected from the potential local political competition under a new implicit political contract.

State capture follows. With the return to statism from 2003 onwards (Hanson, 2007; OECD, 2006), the organizational features of the big players evolve, but the mechanism remains similar. Åslund (2005) states that after the new reorganisation of the energy sector, the huge oil revenues corrupt the top of the state administration and the market reforms needed to enhance economic efficiency had become suboptimal for the top officials. There is a danger of renewed state energy monopoly, implying the shift from a system of oligarchs' control to a system of *bureaugarchs'* control of hydrocarbons revenues. The identity of the key players could change at the local level, but not the basic mechanism of political capitalism. As documented by Svedberg *et al.* (2006), oil and gas regions open the ranking of regions ordered by the extent of state capture. If anything, this pattern became more clear now then it was in the late 1990s. Big companies may follow a seemingly paternalistic approach offering fringe benefits and in-kind payments to its employees. However, the problem is that this policy has a detrimental effect upon the labour mobility and therefore – indirectly – upon the income distribution. Even more seriously, state capture on regional level is strongly correlated with weak entrepreneurship and low entry (Svedberg *et al.*, 2006). This produces inequality as it closes some efficient channels to exit poverty and make the monopsonistic features of the labour market even stronger. As explicitly explained by one of the regional officials in an interview, entry is perceived as bad to local businesses as it may create competition driving wages up (Estrin and Prevezer, 2006).

There are some important extensions to our analysis that we have not yet followed. It would be an interesting extension of current research to investigate to what degree the same pattern applies to other post-Soviet republics. In particular, there is evidence that a similar situation of regional inequality associated with oil extraction may be present in Kazakhstan (Kaiser, 2006). In addition, it would also be interesting to explore if some effects similar to country-level "Dutch disease" operate at the regional level via differences in regional price level. This is beyond the scope of the current analysis.

In summary, we stress the interactions between economic structures, political processes and social outcomes. We demonstrate that oil and gas leads to inequality at the local level and argue that there is evidence that the link between the two is via corrupted political mechanism and distorted economic institutional frameworks. However, as observed by Bradshaw (2006), the example of Norway demonstrates that oil does not need to produce socially undesirable effects if coupled with an efficient political mechanism. There is nothing deterministic or inevitable about the future in our conclusions. Russia is too large and complex to make strong assumptions about the sustainability of the current trends. Its potential for change should not be underestimated.

References

Aghion, P., Caroli, E. & Garcia-Penelosa, C. (1999), 'Inequality and Economic Growth: The Perspective of New Growth Theory', *Journal of Economic Literature*, 37, 4, 1615-1660.

Arellano, M. & Bond, S. (1991), 'Some tests of specification for panel data: MonteCarlo Evidence and an Application to employment equations', *Review of Economics Studies*, 58, 2, 227-97.

Arellano M. & Bover, O. (1995), 'Another Look at the Instrumental Variable Estimator of Error-Components Models', *Journal of Econometrics*, 68, 1, 29-52.

Åslund, A. (2002), *Building Capitalism. The Transformation of the Former Soviet Block* (Cambridge, Cambridge University Press).

Åslund, A. (2005), 'Putin's Decline and America's Response', Policy Brief, Carnegie Endowment for International Peace, 2005.

Berkowitz, D. & Jackson, J. E. (2006) 'Entrepreneurship and the Evolution of Income Distributions in Poland and Russia', *Journal of Comparative Economics*, 34, 2, 338-356.

Bignebat, C. (2003), 'Spatial dispersion of wages in Russia: does transition reduce inequality on regional labour markets?', TEAM University of Paris I & CNRS, mimeo.

Blundell, R. & Bond, S. (1998), 'Initial Conditions and Moment Restrictions in Dynamic Panel Data Models', *Journal of Econometrics*, 87, 1, 115-143.

Blundell, R. & Bond, S. (2000) 'GMM estimation with persistent panel data: an application to production functions', *Econometric Reviews*, 19, 3, 321–340.

Bradshaw, M. (2006), 'Observations on the Geographical Dimensions of Russia's Resource Abundance,' *Eurasian Geography and Economics*, 47, 6, 724–746.

Bradshaw, M. J. & Vartapetov, K. (2003) 'A New Perspective on Regional Inequalities in Russia,' *Eurasian Geography and Economics*, 44, 6, 403-429.

Buccellato, T. (2007), *Convergence across Russian Regions: A Spatial Econometrics Approach*, Discussion Paper 70 (London, CEFIMS SOAS University of London).

Commander, S., Tolstopiatenko, A. & Yemtsov, R. (1999) 'Channels of Redistribution-Inequality and poverty in the Russian transition,' *The Economics of Transition,* 7, 2, 411-47.

Considine, J. I. & Kerr, W. A. (2002), *The Russian Oil Economy* (Cheltenham, U.K. & Nothampton, MA, USA, Edward Elgar).

Corden, W. M. & Neary, J. P. (1982), 'Booming Sector and De-Industrialisation in a Small Open Economy,' *The Economic Journal*, 92, 368, 825-848.

Corden, W. M. (1984), 'Booming Sector and Dutch Disease Economics: Survey and Consolidation', *Oxford Economic Papers*, 36, 3, 359-380.

DeBardeleben, J. (2003), 'Fiscal Federalism and How Russians Vote', *Europe-Asia Studies*, 55, 3, 339-363.

Eastwood, R. K. & Venables, A. J. (1982), 'The Macroeconomic Implications of a Resource Discovery in an Open Economy', *The Economic Journal*, 92, 366, 285-299.

Ellman, M. (ed.), (2006), *Russia's Oil and Natural Gas- Bonanza or Curse?* (London, Anthem Press).

Estrin, S. & Prevezer, M. (2006) 'On the Role of Institutions in Firm Entry and Survival in Emerging Markets; A Cross-Country Case Study Approach', paper presented at CNEM seminar, London Business School, mimeo.

Federov, L. (2002), 'Regional Inequality and Regional Polarization in Russia,' 1990–99', *World Development*, 30, 3, 443–456.

Fortescue, S. (2006), *Russia's Oil Barons and metal Magnates. Oligarchs and the State in Transition* (Houndmills, Palgrave Macmillan)

Gaddy, C. G. & Ickes, B. W. (2005), 'Resource Rents and the Russian Economy,' *Eurasian Geography and Economics*, 46, 8, 559–583.

Galbraith, J. K., Krytynskaia, L. & Wang, O. (2004) 'The Experience of Rising Inequality in Russia and China during the Transition', *The European Journal of Comparative Economics*, 1, 1, 87-106

Gel'man, V. (1999) 'Regime Transition, Uncertainty and Prospects for Democratisation: The Politics of Russian Regions in a Comparative Perspective', *Europe-Asia Studies*, 51, 6, 939-956.

Gerry, C. J. & Mickiewicz, T. M. (2008), 'Inequality, Democracy and Taxation: Lessons from the Post-Communist Transition,' *Europe Asia Studies*, 60, 1, 89-113.

Glatter, P. (2003), 'Continuity and Change in the Tyumen' Regional Elite 1991-2001', *Europe-Asia Studies*, 55, 3, 401-435.

Gros, D. & Steinherr, A. (1995) *Winds of Change. Economic Transition in Central and Eastern Europe* (Harlow, Longman)

Gurvich, E. T. (2004), 'Makroekonomicheskaya otsenka roli rossiiskogo neftegazovogo sektora', *Voprosy Ekonomiki*, 10.

Gylfason, T. & Zoega, G. (2002), *Inequality and Economic Growth: Do Natural Resources Matter?*, Working Paper 712 (5) (Munich, CESifo).

Hahn, G. (2005), 'Reforming the Federation', in White, S., Gitelman, Z. & Sakwa, R. (2005) *Developments in Russian Politics 6* (Houndmills, Palgrave Macmillan), 148-167.

Hanson, P. (2007), 'The Russian Economic Puzzle: Going Forwards, Backwards or Sideways?', *International Affairs*, 83, 5, 869-889.

Havrylyshyn, O., (2006) *Divergent Paths in Post-Communist Transformation. Capitalism for All or Capitalism for the Few?* (Houndmills, Palgrave Macmillan).

Hayakawa, K. (2007), 'Small Sample Bias Properties of the System GMM Estimator in Dynamic Panel Data Models', *Economic Letters*, 95, 1, 32-38.

Kaser, M., (2006), 'Sustaining Growth: A Prospectus For Labour Market Policies In Kazakhstan', Russian And Eurasian Centre, St Antony's College, University of Oxford, mimeo, 2006.

Kislitsyna O. (2003), *Income Inequality in Russia during Transition-How Can It Be Explained?*, Working Paper 03/08 (Moscow, Economics Education and Research Consortium).

Kolenikov, S. & Shorrocks, A. (2005) 'A Decomposition Analysis of Regional Poverty in Russia', *Review of Development Economics*, 9, 1, 25-46.

Kronenberg, T. (2004), 'The curse of natural resources in the transition economies', *Economics of Transition*, 12, 3, 399–426.

Kryukov, V. & Tokarev, A. (2007) *Neftegazovye Resursy v Transformyeremoi Ekonomike* (Novosibirsk, Nauka-Center).

Kuznets, S. (1955), 'Economic Growth and Income Inequality', *American Economic Review*, 45, 1, 1-28.

Kuznets, S. (1963), 'Quantitative Aspects of the Economic Growth of Nations', *Economic Development and Cultural Change*, 11, 1-80.

Leite, C. A. & Weidman, J. (1999) *Does Mother Nature Corrupt? Natural Resources, Corruption, and Economic Growth*, Working Paper WP/99/85 (Washington D.C., IMF).

Lukyanova, A. (2006), *Wage Inequality in Russia (1994–2003)*, Working Paper 06/03 (Moscow, Economics Education and Research Consortium).

Lundberg, M. & Squire, L. (2003) 'The Simultaneous Evolution of Growth and Inequality', *Economic Journal*, 113, 487, 326-344.

Mickiewicz, T. (2005), *Economic Transition in Central Europe and the Commonwealth of Independent States* (Houndmills, Palgrave Macmillan).

Milanovic, B. (1998) *Income, Inequality and Poverty during the Transition from Planned to Market Economy* (Washington D.C., World Bank).

OECD (2006) *Economic Surveys: Russian Federation* (Paris, Organisation for Economic Cooperation and Development).

Popov, V. (2001), 'Reform Strategies and Economic Performance of Russia's Regions', *World Development*, 29, 5, 865-886.

Reuveny, R. & Li, Q. (2003) 'Economic Openness, Democracy, and Income Inequality. An Empirical Analysis', *Comparative Political Studies*, 36, 5, 575-601.

Sachs, J. D. & Warner, A. M. (2001) 'Natural Resources and Economic Development-The curse of natural resources,' *European Economic Review*, 45, 4-6, 827-838.

Sakwa, R. (2008) *Putin. Russia's Choice* (London, Routledge).

Sala-I-Martin, X., Doppelhofer, G. & Miller, R. I. (2004) 'Determinants of Long-Term Growth: A Bayesian Averaging of Classical Estimates (BACE) Approach', *American Economic Review*, 94, 4-6, 813-835.

Slider, D. (2005) 'Politics in the Regions', in White, S., Gitelman, Z. & Sakwa, R. (eds.), *Development in Russian Politics 6* (Houndmills, Palgrave Macmillan), 168-185.

Solanko, L. (2003) *An Empirical Note on Growth and Convergence Across Russian Regions*, Discussion Paper 9 (Helsinki, Bank of Finland, Institute for Economies in Transition).

Svedberg, M., Ono, J. & Mosina, O. (2006) (eds.), *Unleashing the Potential. Growth and Investment in Russian Regions* (Moscow and Stockholm: Centre for Economic and Financial Research and Stockholm Institute of Transition Economics).

Treisman, D. (1998), 'Deciphering Russia's Federal Finance: Fiscal Appeasement in 1995 and 1996', *Europe Asia Studies*, 50, 5, 893-906.

UNDP (2007) *Russian Regions: Goals, Challenges, Achievements. Human Development Report. Russian Federation 2006/2007* (New York, United Nations Development Programme).

Yakovlev, E. & Zhuravskaya, E. (2004) *State Capture and Controlling Owners of Firms*, Working Paper 44 (Moscow, CEFIR).

Yemtsov, R. (2003), *Quo Vadis? Inequality and Poverty Dynamics across Russian Regions*', Discussion Paper 67 (Helsinki, WIDER).

Yenikeyeff, S. (2008) *The Battle for Russian Oil: The Kremlin, Governors and Oligarchs* (Oxford, Oxford University Press), forthcoming.

World Bank (2004), *Country Economic Memorandum for Russia* (Washington D.C., World Bank).

Table 1: Determinants of percentage shares of income across population quintiles for 86 Russian regions over 2000-2004.

-System_GMM-					
	FIRST	SECOND	THIRD	FOURTH	FIFTH
L. dep_var	0.742	0.721	0.781	0.873	0.851
	(0.088)***	(0.097)***	(0.098)***	(0.089)***	(0.087)***
P_OIL&GAS	-0.004	-0.005	-0.003	-0.001	0.008
	(0.002)**	(0.002)**	(0.002)	(0.001)*	(0.006)
ENROLLMENT_RATE	-0.002	-0.002	-0.003	-0.001	0.008
	(0.004)	(0.004)	(0.003)	(0.001)	(0.01)
l_RGDP	-0.08	-0.093	-0.058	-0.015	0.155
	(0.056)	(0.061)	(0.044)	(0.013)	(0.157)
l_EXPORT	0.009	0.022	0.002	0.008	0.017
	(0.035)	(0.037)	(0.027)	(0.007)	(0.107)
SERV	-0.007	-0.006	-0.003	-0.001	0.013
	(0.003)**	(0.003)*	(0.002)	(0.001)	(0.01)
YEAR==2001	0.044	0.066	0.014	0.017	0.032
	(0.061)	(0.069)	(0.046)	(0.009)*	(0.191)
YEAR==2002	-0.049	-0.037	-0.046	-0.004	0.285
	(0.053)	(0.06)	(0.042)	(0.01)	(0.143)**
YEAR==2003	-0.196	-0.181	-0.162	-0.024	0.656
	(0.036)***	(0.041)***	(0.032)***	(0.010)**	(0.128)***
Constant	2.874	4.393	4.44	3.077	3.776
	(0.854)***	(1.368)***	(1.797)**	-2.07	-3.863
Observations	337	337	337	337	337
Number of ID	86	86	86	86	86
Number of instruments	86	86	86	86	86
Arellano-Bond test for AR(1) in first differences:					
z =	-2.93	-2.91	-3.23	-3.70	-3.08
Pr > z =	0.003	0.004	0.001	0.000	0.002
Arellano-Bond test for AR(2) in first differences:					
z =	-0.75	-0.31	-0.34	-0.41	-0.72
Pr > z =	0.452	0.753	0.737	0.682	0.473
Hansen test of over-identifying restrictions:					
chi2(22)	36.28	36.88	34.83	47.88	38.20
Prob > chi2	0.455	0.428	0.524	0.089	0.370

Robust standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 2: Determinants of the gap in shares of income across population quintiles. All differences are computed with respect to the richest percentile for 86 Russian regions over 2000-2004.

-System_GMM-				
	DIST_FIRST_FIFTH	DIST_SECOND_FIFTH	DIST_THIRD_FIFTH	DIST_FOURTH_FIFTH
L.dep_var	0.533	0.537	0.551	0.574
	(0.126)***	(0.126)***	(0.126)***	(0.123)***
P_OIL&GAS	0.03	0.031	0.028	0.023
	(0.012)***	(0.012)***	(0.011)**	(0.009)**
l_RGDP	0.274	0.311	0.311	0.28
	(0.222)	(0.224)	(0.217)	(0.184)
ENROLLMENT_RATE	0.011	0.011	0.013	0.012
	(0.013)	(0.014)	(0.012)	(0.01)
l_EXPORT	-0.044	-0.051	-0.047	-0.043
	(0.11)	(0.112)	(0.106)	(0.089)
SERV	0.028	0.028	0.024	0.019
	(0.019)	(0.019)	(0.017)	(0.014)
YEAR==2001	-0.834	-0.811	-0.7	-0.534
	(0.421)**	(0.418)*	(0.385)*	(0.305)*
YEAR==2002	-0.298	-0.275	-0.229	-0.146
	(0.342)	(0.34)	(0.317)	(0.256)
YEAR==2003	0.445	0.453	0.454	0.396
	(0.207)**	(0.207)**	(0.195)**	(0.159)**
Constant	12.619	9.889	7.319	4.305
	(5.505)**	(4.887)**	(4.236)*	-3.184
Observations	330	330	330	330
Number of ID	86	86	86	86
Number of instruments	86	86	86	86
Arellano-Bond test for AR(1) in first differences:				
z =	-2.35	-2.41	-2.45	-2.56
Pr > z =	0.019	0.016	0.014	0.010
Arellano-Bond test for AR(2) in first differences:				
z =	-0.24	-0.18	-0.18	-0.22
Pr > z =	0.813	0.855	0.856	0.822
Hansen test of over-identifying restrictions:				
chi2(22)	58.92	60.29	59.23	59.91
Prob > chi2	0.268	0.229	0.259	0.239

Robust standard errors in parentheses: * significant at 10%; ** significant at 5%; *** significant at 1%

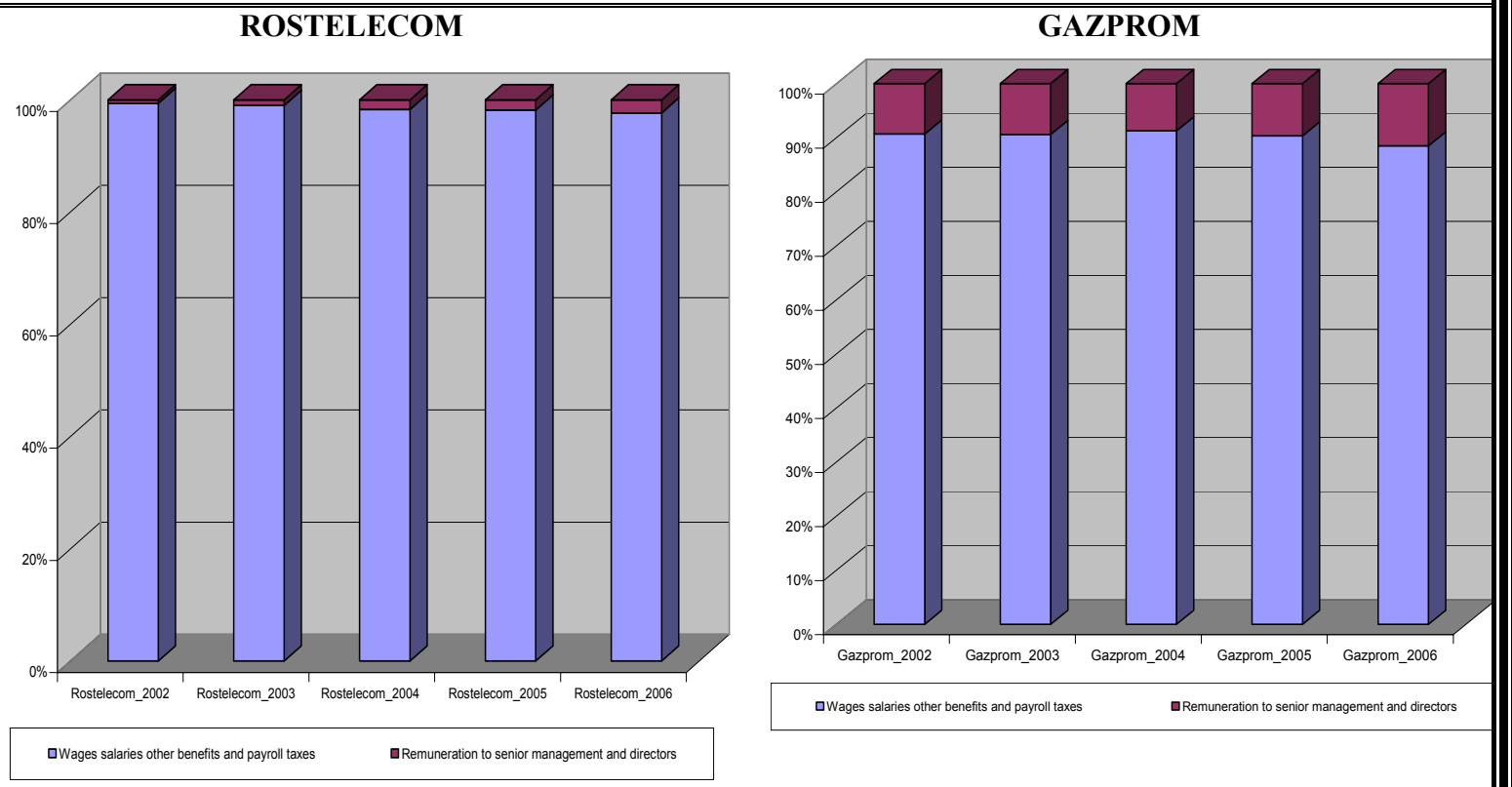
Table 3: Testing different dependent variables on the model. The time span is 2003-2005 for the Gini index and for the ratio between the income perceived by the richest ten percent and the poorest ten percent (diff_income). For the Theil it is instead 2000-2004.

-Between Effects-

	GINI	Coef_Diff_Income	THEIL
P_OIL&GAS	0.001	0.063	0.053
	(0.0001)***	(0.008)***	(0.006)***
l_RGDP	0.011	0.928	0.298
	(0.004)***	(0.279)***	(0.188)
ENROLLMENT_RATE	0.000	0.01	-0.009
	(0.000)	(0.016)	(0.01)
l_EXPORT	-0.003	-0.232	0.004
	(0.002)	(0.163)	(0.108)
SERV	0.001	0.051	0.01
	(0.000)***	(0.018)***	(0.012)
Constant	0.216	-1.201	-3.265
	(0.036)***	(2.878)	(1.869)*
Observations	255	255	411
Number of ID	86	86	86
R-squared	0.66	0.86	0.75

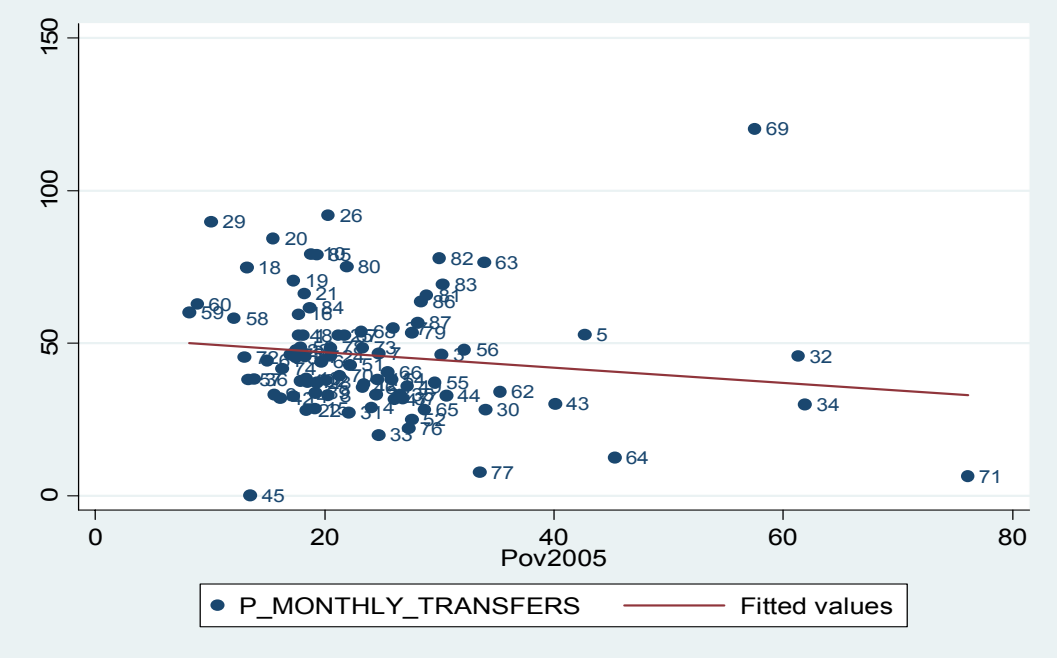
Standard errors in parentheses* significant at 10%; ** significant at 5%; *** significant at 1%

Figure 1: The remuneration of senior management and directors compared with wages and salaries of workers. Rostelecom and Gasprom over the period 2002-2006.



Source: Financial Reports of the two companies for the period considered (2002-2006)

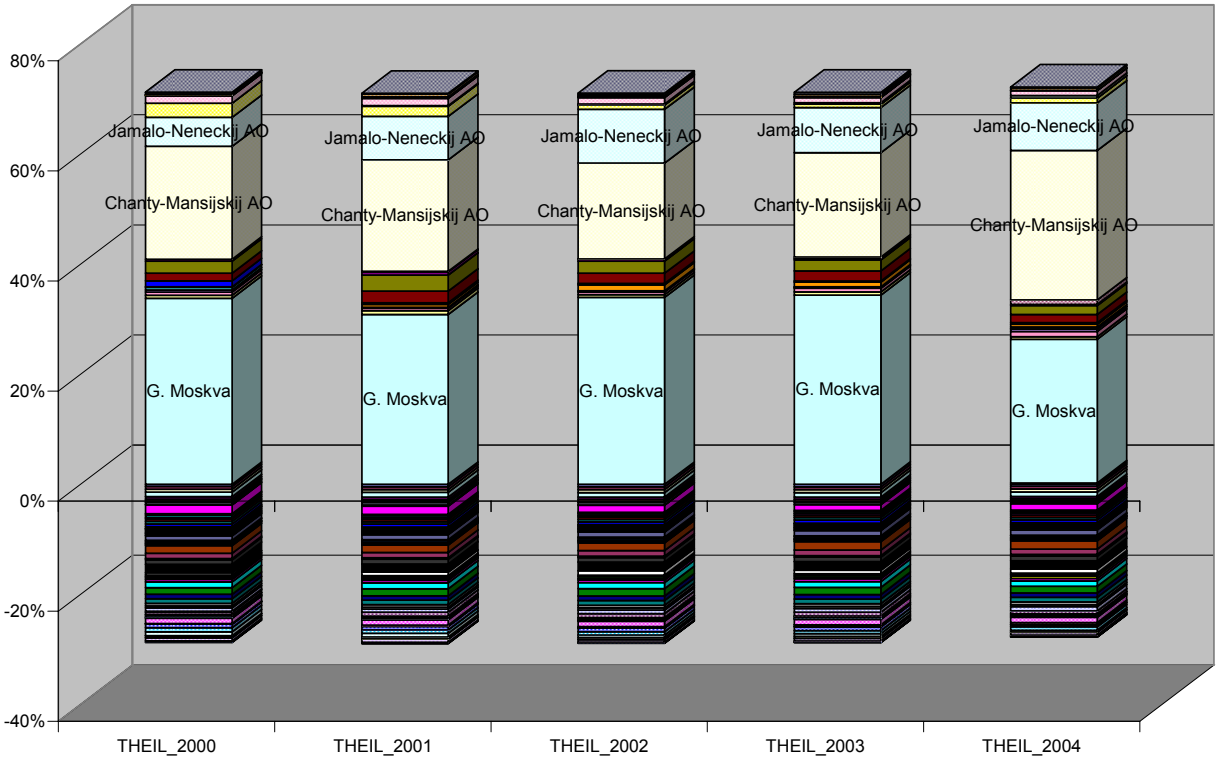
Figure2: Per capita average monthly transfers in roubles and percentage of people living below the poverty threshold in 87 Russian regions in 2005.



REGION	ID	REGION	ID	REGION	ID
Belgorodskaya Oblast	1	Respublika Adygeya	30	Chanty-Mansiyskiy AO	59
Brjanskaya Oblast	2	Respublika Dagestan	31	Jamalo-Neneckiy AO	60
Vladimirskaya Oblast	3	Respublika Inguscetiya	32	Cheljabinskaya Oblast	61
Voronezhskayja Oblast	4	Kabardino-Balkarskaja Respublika	33	Respublika Altay	62
Ivanovskaya Oblast	5	Respublika Kalmykiya	34	Respublika Burjatiya	63
Kaluzhskaya Oblast	6	Karachaeva-cherkesskaja Respublika	35	Respublika Tyva	64
Kostromskaya Oblast	7	Respublika Severnaya Osetija-Alaniya	36	Respublika Chakaciya	65
Kurskaya Oblast	8	Krasnodarskiy krai	37	Altayskiy Krai	66
Lipeckaya Oblast	9	Stavropolskiy krai	38	Krasnoyarskiy krai	67
Moskovskaya Oblast	10	Astrachanskaya Oblast	39	Taymyrskiy AO	68
Orlovskaya Oblast	11	Volgogradskaya Oblast	40	Evenkiyskiy AO	69
Rjazanskaya Oblast	12	Rostovskaya Oblast	41	Irkutskaya oblast	70
Smolenskaya Oblast	13	Respublika Bashkortostan	42	Ust-Ordynskiy Burjatskiy AO	71
Tambovskaya Oblast	14	Respublika Mariy El	43	Kemerovskaya Oblast	72
Tverskaya Oblast	15	Respublika Mordoviya	44	Novosibirskaya Oblast	73
Tulskaya Oblast	16	Respublika Tatarstan	45	Omskaya Oblast	74
Jaroslavskaya Oblast	17	Udmurtskaya Respublica	46	Tomskaya Oblast	75
G. Moskva	18	Chuvashskaya Respublika	47	Chitinskaya Oblast	76
Respublika Kareliya	19	Kirovskaya Oblast	48	Aginskiy Burjatskiy AO	77
Respublika Komi	20	Nizhegorodskaja Oblast	49	Respublika Sacha (Jakutija)	78
Archangelskaya Oblast	21	Orenburgskaya Oblast	50	Primorskiy krai	79
Neneckiy AO	22	Penzenskaya Oblast	51	Chabarovskiy krai	80
Vologodskaya Oblast	23	Permskaya Oblast	52	Amurskaya Oblast	81
Kaliningradskaya Oblast	24	Samarskaya Oblast	53	Kamchatskaya oblast	82
Leningradskaya Oblast	25	Saratovskaya Oblast	54	Koryakskiy AO	83
Murmanskaya Oblast	26	Ulyanovskaya Oblast	55	Magadanskaya Oblast	84
Novgorodskaya Oblast	27	Kurganskaya Oblast	56	Sachalinskaya Oblast	85
Pskovskaya Oblast	28	Sverdlovskaya Oblast	57	Evreyskaya avtomnaya oblast	86
G. Sankt-Peterburg	29	Tjumenskaya Oblast	58	Chukotskiy Avtonom. Okrug	87

Source: The graph is based on data as provided by the Russian State Statistic Service (Goskomstat).

Figure 3: Theil's T statistic computed for 87 Russian regions over the period 1995, 2000-2004.



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