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Poverty and Economic Growth in Russia's Regions

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Abstract:

The extent of poverty reduction has varied enormously during the recovery period across the eighty-three regions of Russia, with some regions continuing to experience increases in poverty even though they have returned to growth. We attempt to understand and analyse the reasons for this regional variation. We focus on two principal causative factors: the changes in economic structure resulting from the liberalisation of the economy, and policy instruments aimed at poverty reduction. We find that many regions which experienced structural change under *perestroika* (notably those benefiting from the current oil and gas boom) experienced massive growth in GDP but little poverty reduction, because their prevailing production function is capital-intensive and thus they were unable to transmit much or any reduction in poverty through the labour market. Regions where the growth of the early 2000s was diversified, was based more on the service sector, and where the educational system made possible flexibility within the labour market, tended to be more effective at generating poverty reduction.

Key words: Russia, poverty, regional analysis

JEL: I32, P26

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1. Introduction

In few countries have the social costs of adjustment been as severe as in Russia. The widespread market reforms initiated by the Russian Federation in 1992 following the disintegration of the Soviet Union had severe macro-economic consequences, including a hyperinflation in 1992-3, an output decline of more than 40% between 1992 and 1998, a chronic fiscal gap which became acute when Russia succumbed to the 'East Asian crisis' in 1998, and a massive downsizing of the public sector across the entire field of economic activity. Once the government withdrew from ownership and control of state-owned enterprises (SOEs), those enterprises shed several million jobs, with the axe falling particularly heavily on the less competitive and more vulnerable groups of workers, especially females[1], the less skilled, and those living in regions which lacked competitive or political leverage. Labour market distortions led to rising wage arrears that, at their peak in 1997, affected around two-thirds of the workforce (Lehman, Wadsworth and Acquisti, 1999); and because of the fiscal crisis, social welfare payments, so far from being increased to help these vulnerable groups, were radically reduced. In the process, the Gini index of inequality rose from one of the lowest in the world at the end of the 1980s to a level higher than that of the United States (Brainerd 1998), and poverty, on several indicators, grew to frightening levels. In Russia between 1992 and 1998, the headcount index of poverty grew, although measures of this vary, by a factor of about three (Klugman and Braithwaite 1998; see further Table 1 below); there was a general deterioration in health and morbidity (Stillman 2005; Stillman and Thomas 2008); overall mortality, which in other countries afflicted by adjustment continued on a declining trend, rose continuously through the decade[2]; and even suicide rates experienced a sharp upward trend (Brainerd, 2001). Thus the process of macro-economic adjustment, which imposed severe social costs around the world, in Russia took on the nature of a catastrophe.

Between 1999 and 2000 there was a turning-point: the persistent decline in the Russian macro-economy ended, and annual GDP growth in the subsequent period under the presidency of Vladimir Putin, during which state policy has been once again a great deal more interventionist, has averaged over 5 per cent since those years (Hanson, 2007a). The World Bank, in its recent review, describes this economic recovery (to 2002) as being 'pro-poor' (2004: xii, para.9). However, apart from this initial assessment, relatively little is known about the ability of that growth to relieve the disturbing levels of poverty which appeared during the period of perestroika: about whether that growth is 'pro-poor' in the sense investigated by the recent World Bank review of country experience (Besley and Cord, 2007) and about whether any politically feasible policies exist which might make it more so.

The purpose of this paper is to investigate those questions. In Section 2, we review the overall evolution of poverty and other well-being indicators since the millennium, and show that although poverty has shrunk across Russia as a whole since 2000, there is considerable cross-regional and cross-sectoral

[1] During the transition, female employment dropped even more markedly than female labour force participation and by 2000 a substantial gender gap in pay had emerged (Kazakova, 2007).
[2] The crude death rate rose from 12 to 15 per thousand between 1990 and 2001 (Stillman 2006, p. 114). The overall relationship between depth of reform and mortality across all the transition economies is investigated by Brainerd (1998).

variation, and in some regions of Russia such growth as there is provides few or even negative benefits to the poor. Section 3 examines macro-economic conditions. Section 4 tries to understand variations in 'poverty elasticity', that is in the tendency of the post-2000 growth process to be pro-poor or otherwise in particular regions, and shows that this is determined partly by the changes in economic structure induced by *perestroika* but partly by political factors. In Section 5, we sketch out a model and we test a simple model of the interaction between these factors in Section 6, using case-studies of the most and least pro-poor regions to give light and shade to the model. Section 7 concludes.

2. Evolution of Poverty and Income Inequality

As already mentioned, the trend of indicators of poverty and deprivation in Russia during the 1990s and 2000s varies not only according to the indicator of poverty selected, but also according to the source; Table 1 sets out some of the alternative measures which exist.

Table 1. Indicators of Living Standards, 1990-2006

Year	Headcount index (P^0)		Gini coefficient of inequality		Real wage	Mortality	Life expectancy
	Official poverty line	'Extreme poverty' ($2/ day)	FSSS	World Bank		FSSS	
1990	0.101					11.2	69.38
1991	0.114					11.4	69.01
1992	0.335				67	12.2	67.89
1993	0.315				100	14.5	65.14
1994	0.224	22.7		0.483	92	15.7	63.98
1995	0.248		0.387		72	15.0	64.64
1996	0.220	22.6		0.461	106	14.2	65.89
1997	0.207				105	13.8	66.64
1998	0.233	36.26		0.486	87	13.6	67.02
1999	0.283				78	14.7	65.93
2000	0.290	23.76	0.395	0.456	121	15.3	65.34
2001	0.275		0.397		120	15.6	65.23
2002	0.246	13.48	0.397	0.399	116.2	16.2	64.95
2003	0.203		0.403		111	16.4	64.85
2004	0.176		0.409		110.6	16.0	65.27
2005	0.177		0.406		112.6	16.1	65.30
2006	0.153		0.410		113.3	15.2	66.60

Notes and sources: Headcount index of poverty (col. 1) = proportion of individuals with incomes below the national poverty line; for 1992-1999, *official poverty line* estimates are from 2004 *Russia in Figures*; for 2000-2006 estimates are from 2007 *Russia in Figures.* [Note that after 2000 the poverty estimates move on to a different methodology; in 2005, change to consumer basket structure occurred. *International* poverty line (col. 2) = poverty headcount ratio at $2 a day (PPP) (% of population); estimates are from World Bank, *World Development Indicators (WDI),* 2005 edition. *Gini Index* (col. 3) = income inequality measure, expressed to two significant figures. Alternative estimates from FSSS and from World Bank, *WDI 2005 edition,* are displayed. *Real wage* (col. 4) = inflation-adjusted wage relative to the previous year; from FSSS. *Mortality and Life Expectancy measures* (cols. 7 and 8) are from *Regions of Russia* (various years). Adjusted, following 2002 Population Census, data are reported.

As shown in Table 1, there was a sharp increase in all indicators of poverty, including mortality, at the beginning of the 1990s; after the early 1990s all the headcount indicators of poverty experience a temporary dip, rise again during the macro-economic crisis of 1998-99, and do not begin to fall definitively until that crisis is over. During the 1998-99 crisis, a particularly heavy burden of adjustment falls on to pensioners: in 1998 alone, the nominal pension as a proportion of the poverty line falls by 40%[3]). The deterioration in the mortality indicators persists for an even longer period. The death rate rises continuously through the 1990s and early 2000s, from 11 to 16 per thousand, and does not begin to fall until 2004. Life expectancy, for the federation as a whole, falls from 69.4 in 1990 to 64.8 in 2003; life expectancy rises to 65.2 with a continued slight increase in 2005[4]. It seems likely, therefore, that the turning point in all the morbidity and mortality indicators was well into in the early 2000s, some three to four years after the turning-point in the headcount poverty indicators[5].

Only the unadjusted headcount index of poverty (P^0) is presented in Table 1. In Table 2, we present expenditure-based estimates of poverty indices based on the Russian Longitudinal Monitoring Survey (RLMS), a nationally representative survey that contained around 6,000 households in the first four rounds. The data show that headcount poverty rate rose to 37 per cent in 1993 and further to 41 per cent in 1995. However, the poverty depth indicator FGT(1) - the average amount by which someone who was poor fell below the poverty line - peaked in 1993 – and the poverty severity index FGT(2), that takes into account inequality among the poor (as larger poverty gaps acquire greater weight and the measure becomes sensitive to these gaps), peaked in 1993. The FGT(2), which is the most sensitive to depth of poverty, begins to improve in 1994: the implication may be that the most severe deprivation was experienced during the period of greatest macro-economic dislocation between 1991 and 1993.

[3] The absolute value in headcount poverty around the turn of the millennium is difficult to gauge because there is a change in the method of computation by FSSS in 2000. Nonetheless it seems clear that there was a turning-point in the trend of headcount poverty at exactly this time, as this is indicated also by the World Bank $2/day measure.

[4] There is a substantial literature about the main causes of this persisting increase in mortality. It seems clear that mortality from cardiovascular diseases rose by much more than mortality as a whole, and was a major contributor to the increase in the overall death rate (Stillman, 2005).

[5] One likely reason for this later turning point is illustrated by Stillman and Thomas (2008, Table 1, p. 1393): during the crisis, consumption of fats and starches went up but consumption of fresh fruits and vegetables fell sharply, worsening the diet especially of low-income people and increasing mortality rates.

Table 2. Indicators of Poverty, 1992-1995

	1992	1993	1994	1995
Poor households	25.2	31.9	26.8	35.0
Very poor households	8.4	12.0	10.4	10.9
FGT(0)	26.8	36.9	30.9	41.1
FGT(1)	9.8	13.6	11.7	13.2
FGT(2)	5.4	8.0	7.2	6.0

Notes: Poor households = share of households with expenditure below the official poverty line; Very poor households = share of households with expenditures less than half the poverty line. FGT(0), FGT(1) and FGT(2) are the standard Foster-Greer-Thorbecke aggregate poverty measures. See Ravallion (1992) for further details.
Source: Klugman and Braithwaite (1998, Table 3).

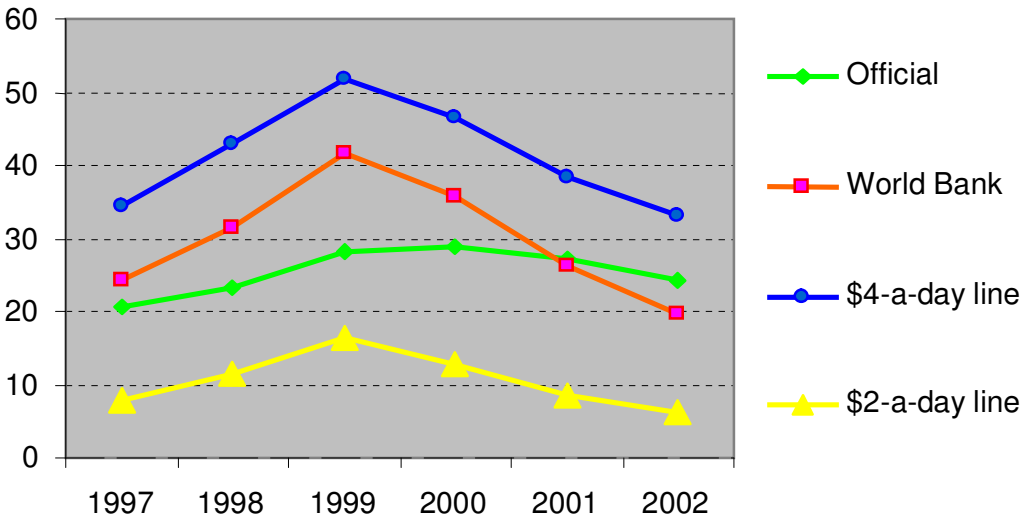
A few data-related caveats are required. Both World Bank and FSSS poverty estimates are computed by applying the prices from household surveys to cost the minimum consumption basket. However, the nature of the survey data used has changed through time, both in terms of coverage and in terms of weights between commodities. The method of calculating the poverty line originally adopted under Khrushchev in the late 1950s was revised in November 1992. According to Ovcharova (2001), the new poverty line was revised downwards, representing 70 per cent of the Soviet level; it increased the weight placed on food expenditures, and excluded some durables (furniture and kitchen appliances). The non-food basket consisted of non-food products (19.1 per cent), services (7.4 per cent) and compulsory payments and charges (5.2 per cent). In 1994, in view of growing wage arrears and growing earnings in informal economy, an expenditure-based poverty measure was introduced to reduce the measurement bias associated with the income-based approach. In 2000 there is a further break in the poverty line: a new methodology was introduced that places more weight on non-food expenditures and services, differentiates estimates of the subsistence minimum by region, and broadens the sampling base (since 2000) to cover around 49,000 households: the new (post-2000) poverty line is estimated to be 15 to 20 per cent higher, in real terms, than that of 1992-99 (World Bank, 2004). For these reasons, we must note that across-time comparisons of several of the poverty indices discussed are imperfect, and much of the work of this paper consists of an attempt to improve comparability by correcting these imperfections.

It is useful to compare the official estimates of both poverty and inequality with World Bank (2004) estimates that use a different poverty line and methodology. In particular, the World Bank methodology estimates the value of food and non-food baskets on the basis of household consumption patterns, attempts to adjust between regions for inconsistencies in the official subsistence minimum, and makes adjustments to take account of economies of scale in non-food goods and services. The comparative poverty indices are plotted in Figure 1, and suggest that the World Bank (2004) estimates at any rate are more sensitive to economic shocks (Figure 1): the poverty peak around the 1998 financial crisis was more severe on the World Bank than on the FSSS computation method[6]. According to that approach, around 23.9 million

[6] Note that this applies strictly to the 1998-99 crisis only. As we do not have international poverty-line estimates for 1991 through 1994, the peak years of macro- economic

Russians, or about 16.4 per cent of the population, survived on less than $2 per day (expressed in 2000 purchasing power parity terms), the international poverty line for middle-income countries.[7]

Figure 1. Poverty Rates (%), 1997-2002



Source: World Bank (2004, Table 6.3).

The Gini index of inequality, as measured by both the FSSS and the World Bank, climbs sharply though the early 1990s; however, after the middle of the decade there is a divergence between the two series. The World Bank inequality series continues to climb through the later part of the 1990s and then settles back, like its headcount poverty series, in 2000; by contrast, the FSSS series has a dip in the mid-nineties, climbs again around the time of the 1998 financial crisis, and then settles back. Some elements of inequality, however, have continued to increase through the early 2000s up to the present, notably inequality of earnings between men and women.

In terms of income and inequality, therefore, the element of consensus emerging from the different sources is that there was a turning-point in both poverty and interpersonal inequality at the end of the 1990s, with a later turning-point for mortality and morbidity than for the poverty headcount. Income inequality, after its huge increase in the early 1990s, has reached a plateau.

However what is enormously heterogeneous, and not previously

disequilibrium, it is not easy to make inter-series comparisons for the earlier part of the crisis – but the World Bank $2/day estimate for 1995 is only just over half the FSSS estimate, suggesting that at that time the World Bank series may have been less volatile.

[7] At that point, 4 million people (2.7 per cent of the population) lived in absolute deprivation even measured by the standards of the poorest populations of the world, e.g. in Africa ($1.07-a-day measure, or $1 at 2000 PPP) and, over half the population (around 75.6 million) lived below the $4 PPP poverty line used for international comparisons in developed economies.

documented, is the diversity in *regional* trends in poverty. Post-transitional Russia, with population of around 142.1 million (in 2006) spread across 11 time zones, 6,592,800 square miles and 83 units of devolved government, or 'federal subjects' now, in the wake of the widening of income distribution previously referred to, contains regions with a per capita income as high as Luxemburg, as well as regions with an average with as low as sub-Saharan Africa [8]. Moreover, growth now that it has resumed has not been evenly spread, and in some regions of Russia, as has been the case internationally, quite strong growth even where achieved has been associated not with a decrease but with an increase in poverty, in defiance of the federal trend towards declining levels of poverty; in some regions mortality is still increasing.

In Table 3, using the repeated cross-sections that combine July and September waves of the 2000-2006 Monitoring of Economic and Social Changes public opinion survey conducted by the Russian Centre for Public Opinion Research (or VCIOM, its Russian acronym)[9], we present inequality and poverty measures assessed with reference to total disposable income which includes cash wages and salaries, income from self-employment, imputed incomes from home production and in-kind income, dividends, income from rentals, social transfers and inter-household cash transfers. The poverty line is set to equal 50% of median income. The income figures are adjusted for inflation (July 2000 = 100) using price deflators provided by FSSS. We use modified OECD equivalence scale to adjust for household composition, assuming equal distribution of income among household members.[10] We compare poverty to benchmarks 19.3 per cent in 1992 and 20.1 per cent in 1995 reported by Förster, Jesuit and Smeeding (2003) and 18.8 per cent in 1999-2002 report in UNDP (2006).

Extending the discussion forward to 2006, the comparison with benchmark estimates shows that economic recovery has brought some improvements at the national level. At 14.3 per cent in 2006, the headcount rate has declined by around 29 per cent when compared to the 1995 rate. However, between 2000 and 2006, we do not find any significant reductions in the Foster-Greer-Thorbecke poverty indices. When analysing the whole distribution and censored distribution of individuals below the poverty line, we find some improvements in 2006. In particular, while the mean of income for all individuals rose to 1,550 roubles - the mean of income for individuals living below the poverty line increased from 370 roubles to 466 roubles; the ratio of the (mean) poverty gap to the mean income for poor individuals decreased from 50.5 per cent to 35.6 per cent.[11]

[8] IISP (2007a).
[9] See Data Appendix for further details.
[10] The OECD revised equivalence scale (ES) with stronger scale economies is given by: ES = 0.5 + 0.5 × adults + 0.3 × children.
[11] Due to possible data contamination, we also estimated poverty measures using trimmed data. In the absence of any specific information about contamination distribution, we used 'balanced trimming' by removing 1 per cent from each tail of the distribution. As a result, the Foster-Greer-Thorbecke poverty indices decreased in magnitude but showed no significant reductions between 2000 and 2006. See Cowell, Litchfield, and Mercader-Prats (1999) for further discussions on sources and methods for treatment of data contamination.

Table 3. Poverty Indices, 2000-2006

	2000	2002	2004	2006
Panel A. Actual Income				
FGT(0)	0.166	0.153	0.164	0.143
FGT(1)	0.056	0.043	0.054	0.037
FGT(2)	0.028	0.018	0.027	0.015
Mean of income (roubles)	1,425	1,852	1,430	1,550
Mean of income amongst poor (roubles)	370	549	397	466
Mean of poverty gaps (roubles)	187	214	197	166
N (weighted)	4,436	3,830	3,964	3,866
Panel B. Adjusted for Non-respondents (Heckman two-step)				
FGT(0)	0.169	0.159	0.178	0.152
FGT(1)	0.058	0.044	0.057	0.040
FGT(2)	0.029	0.019	0.028	0.016
Mean of income (roubles)	1,463	2,002	1,461	1,572
Mean of income amongst poor (roubles)	384	576	423	488
Mean of poverty gaps (roubles)	201	224	199	174
N (weighted)	4,814	4,210	4,215	4,213
Panel C. Adjusted for Non-respondents (Propensity Score Matching)				
FGT(0)	0.173	0.161	0.173	0.141
FGT(1)	0.059	0.046	0.055	0.037
FGT(2)	0.030	0.020	0.027	0.015
Mean income (roubles)	1,483	1,940	1,463	1,572
Mean income amongst poor (roubles)	378	562	411	466
Mean poverty gaps (roubles)	198	230	195	169
N (weighted)	4,814	4,210	4,215	4,064

Notes: (i) Estimates are based on inflation adjusted per capita household income (July 2000=100). Official inflation indices were used (ii) In Panel B estimates, identification comes from functional form. The RHS variables included 'Age', 'Age squared', education dummies ('University', 'Technical', Vocational' and Secondary'), population point dummies ('Moscow, St. Petersburg', 'Rural'), gender dummy ('Female'), number of workers in the household, and dummy variables that identify sources of income. Full details and estimates are available on request. (iv) Estimates in Panel C are based on counterfactual income (for non-respondents) using propensity score matching. The RHS variables are same as in the Heckit model. Full details and estimates are available on request

Source: Authors' estimates based on the VCIOM data.

We now introduce corrections for non-response. Around 9 per cent of respondents fail to report family income. Thus, if non-reporting is not random, the estimates shown in Panel A of Table 3 are biased. To account for the possible sample selection bias, we apply a two-stage Heckman model and predict family income for non-respondents (a procedure which suffers from the problem that the correction term (λ), was insignificant in the 2004 and 2006 samples). The results based on predicted family income, presented in Panel B, are very similar to those based on reported income. The corrected means of incomes are slightly higher than the uncorrected means, suggesting that non-

reporting is skewed toward high-income households. In Panel C, we present our estimates based on the matching estimator technique where treatment is the non-reporting of income. We use the same set of variables as in the Heckit procedure. We use the most straightforward matching estimator, the Nearest Neighbour matching with replacement.[12] We find that the adjusted poverty rate of around 9 per cent is 6 per cent lower that the results based on the unadjusted poverty lines used in Panels A and B and 10 per cent lower than the poverty rate reported in World Bank (2002).

We now turn to the analysis of income inequality. In Table 4, we present our estimates of income inequality measures. This suggests some tentative evidence, at the aggregate level, of reduction in income inequality from the extremely high levels of the late nineties. Examination of selected percentiles of the household income distribution show that the P90/P10 percentile ratio that refers to points near the extremes of the distribution fell from 6.00 in 2000 to 5.12 in 2006. The P10/P50 ratio shows that the income at the lowest decile relative to the median was stable, increasing sharply in 2006. We also find that per capita income at the 90th percentile relative to the median declined in 2002 and remained stable between 2004 and 2006. Despite Russia's economic recovery, we discover that an alternative measure of inequality - the Gini coefficient - fell by little more than 4 per cent. We conclude that most of the increase (9) in income inequality took place in the early stages of economic transition (2000 and 2002).

Table 4. Inequality Indices, 2000-2006

	2000	2002	2004	2006
Panel A. Actual Income				
Gini	0.422	0.378	0.391	0.376
P90/P10 ratio	6.000	5.280	5.928	5.128
P90/P50 ratio	2.640	2.333	2.500	2.552
P10/P50 ratio	0.440	0.442	0.422	0.498
Panel B. Adjusted for Non-respondents (Heckman two-step)				
Gini	0.419	0.400	-	-
P90/P10 ratio	5.952	5.445	-	-
P90/P50 ratio	2.586	2.400	-	-
P10/P50 ratio	0.434	0.441	-	-
Panel C. Adjusted for Non-respondents (Propensity Score Matching)				
Gini	0.434	0.395	0.396	0.379
P90/P10 ratio	6.173	5.520	6.160	5.324
P90/P50 ratio	2.604	2.475	2.640	2.594
P10/P50 ratio	0.422	0.448	0.429	0.487

Source: Authors' estimates based on the VCIOM data.

Post-transitional Russia, with population of around 142 million spread across 11 time zones, 6,592,800 square miles and 83 federal subjects with considerable disparities in the initial economic conditions, experienced different

[12] See Kaliendo and Kopeinig (2005) for details.

patterns of poverty and income inequality levels. Regional differences are striking. In Dagestan and Tuva republics, poverty rates far exceeded those at the national level. In 1997, close to 80 per cent of the population in the two regions was living in poverty[13]. Muscovites, as well as St. Petersburg and Tyumen residents, fared better (World Bank, 2004). Regional differences in poverty and income inequality are striking and important to assess as increasing concentration of poverty leads to regional polarization.[14]

In Table 5, we present results of inequality decomposition based on the mean log deviation.[15] Estimates show that inequality within regions account for the majority of the mean log deviation. Inequality between regions accounts for increasingly larger share, rising from 18.4 per cent in 2000 to 23 per cent in 2004. Our empirical findings are consistent with the work by Yemtsov (2006), confirming that inequality between regions is growing.[16]

Table 5. Regional Decomposition of the Mean Log Income, 2000-2006

	2000	2002	2004	2006
Mean log deviation	0.316	0.245	0.270	0.238
(total)	*(100%)*	*(100%)*	*(100%)*	*(100%)*
Within regions	0.258	0.198	0.206	0.192
(as share of total)	*(81.6%)*	*(80.8%)*	*(77.1%)*	*(80.7%)*
Between regions	0.058	0.047	0.062	0.046
(as share of total)	*(18.4%)*	*(19.2%)*	*(22.9%)*	*(19.3%)*

Source: Authors' estimates based on the VCIOM data.

Subjective welfare indicators are useful in ascertaining welfare impacts as perceived by survey respondents and enhance our understanding of interactions between self-rated economic welfare and sustainability of adjustment.[17] In Table 6, tabulations show the percent distribution of the subjective status change variable. Assuming that the answers are inter-

[13] See World Bank (2004, Table A.3.2).

[14] See, for example, Yemtsov (2003) for the earlier estimates of regional variations in income inequality.

[15] Based on Theil (1967, 1979) mean log deviation index, expressed as: $T_0 = \frac{1}{n}\sum_{i=1}^{n}\log\frac{\bar{y}}{y_i}$ where y_i is the income of individual i, and $\bar{y}$ the arithmetic mean income, Theil inequality decomposition method is given by: $T_0 = \sum_{j=1}^{J} w_j T_{0j} + \sum_{g=1}^{J} w_j \log\frac{w_j}{v_j}$ where w_j and v_j is the population share and income share (respectively) of the j^{th} region, T_{0j} is the mean log deviation measure calculated for all individuals in region j that consists of n_j individuals. The first term gives a weighted average of T_{0j} and hence represents the component of overall intraregional inequality. The second term is the mean log deviation measure calculated on mean income of each region and gives the component of inequality that is due to interregional inequality.

[16] Yemtsov (2003), using the 1994-2000 HBS data, reports that differences between regions help to account for 85 per cent of the increase in total inequality and the gap between affluent (Moscow, St. Petersburg) and resource-rich (Tyumen) regions and the rest of Russia has widened.

[17] See Lokshin and Ravallion (2000) for theoretical arguments and applications using the RLMS data.

personally comparable, in general, we find that an increasing share of individuals report improved welfare status in the past 12 months. The proportion of individuals for whom welfare worsened dramatically declined for both genders: from 41.4 (43.9) per cent in 2000 to 23.4 (27.1) per cent in 2006 in the case of males (females). We find similar trends for those living in the oblasts and republics. For Moscow and St. Petersburg, there was a larger reduction (increase) in the share of individuals for whom welfare worsened (improved). For instance, worsening (improving) welfare standards were less (more) probable for Moscow and St. Petersburg residents when using the 2006 data. In sum, males and Muscovites assess their well-being more favourably.

Table 6. Perceived Changes in Welfare, 2000-2006.

	2000	2002	2004	2006
Panel A. Males				
Improved	9.2	14.0	15.5	17.8
No change	49.2	57.5	59.8	58.8
Worsened	41.4	28.6	24.6	23.4
N (weighted)	2,089	1,829	1,850	1,869
Panel B. Females				
Improved	9.2	13.2	14.1	14.9
No change	46.8	55.2	54.4	57.9
Worsened	43.9	31.5	31.3	27.1
N (weighted)	2,491	2,204	2,216	2,196
Panel C. Moscow/St. Petersburg				
Improved	9.8	18.0	14.8	18.6
No change	46.5	55.6	632	62.1
Worsened	44.1	26.3	21.8	19.2
N (weighted)	954	389	436	432
Panel D. Regions (except Panel C)				
Improved	9.1	13.1	14.7	15.9
No change	48.1	56.3	56.1	57.8
Worsened	42.7	30.5	29.0	26.1
N (weighted)	3,649	3,644	3,630	3,633

Source: Authors' estimates based on the VCIOM data.

3. The Macro-economic Background

As shown in Table 7, the shock of *perestroika* had a massive impact on the pattern of industry after growth began again. In essence, heavy industry ('machine-building'), the powerhouse of the economy both before and after the Second World War, remained depressed, agro-based and light industries recovered slowly and oil and chemicals recovered rapidly. The share of Siberia's regions in total industrial output, which rose from 20% to 33% between 1990 and 1997, continued to rise after 2000, although in the south of the region

some oblasts continued to decline. In Central Russia, there was a gradual decline in the share of industry from 23% to 15% in favour of the industrial regions located on the Yamal-Taymur-Ural-Volga (geographical) axis (Treivish, 2007). Finally, the ten regions of the western industrial belt in European Russia, incorporating Moscow and St Petersburg, also gained, with a share rising from 45% in 1997 to 53% in 2004 (IISP, 2005).[18]

Table 7. Industrial Output Shares by Industry (%) , 1991-2004

Industry	1991	1995	2001	2004
Power Utilities	3	14	10	11
Fuel	7	16	20	22
Non-Ferrous Metallurgy	5	9	8	12
Ferrous Metallurgy	6	7	8	7
Chemical and Petrochemical	7	8	7	6
Machine Building	24	18	21	19
Timber, Pulp and Paper	6	5	4	4
Construction Materials	4	5	3	3
Light	17	3	2	1
Food	18	12	14	13
Other	3	3	3	2

Source: IISP (2005).

These changes in the structure of production provide the background to the changing levels of income, and of consumption, in each region. The data on GRP per capita show striking differences between resource-rich regions and Moscow vis-à-vis the Republics (Ingushetia, Tyva, Dagestan, Karachay-Cherkessia, Kalmykia, Altai, Kabardino-Balkaria) and oblasts (Ivanovo, Bryansk, Jewish Autonomous, Chita). Even in 1994, at 6,176 roubles, Moscow's GRP per capita was 8.2 times higher than in mainly agrarian Ingushetia Republic and 1.7 times higher than Russia's average GRP per capita of 3,583 roubles (FSSS, 2005). The divide between resource-poor and resource-rich regions widened after growth resumed (Figure 2). In 2002, Ingushetia's GRP per capita was 30 times lower than in Tyumen oblast (including Khanty-Mansi AO and Yamal-Nenets AO) even after the cost-of-living adjustment (Zubarevich, 2005) [19], and in 2005, Moscow's GRP per capita was 3 times higher than Russia's average GRP per capita of 125, 773 roubles, while Tyumen's was 5.3 times higher (FSSS, 2007).

[18] The following ten oblasts/krai dominate Russia's industrial output: Tyumen (9.1%), Moscow (6.9%) Sverdlovsk (4.6%), Samara (4.0%), Chelyabinsk (3.8%), Bashkortostan (3.7%), Tatarstan (3.5%), Krasnoyarsk (3.5%), Nizhny Novgorod (2.9%), and Kemerovo (2.9%). The 2004 shares include Moscow oblasts (4.1%) and exclude Kemerovo oblast.

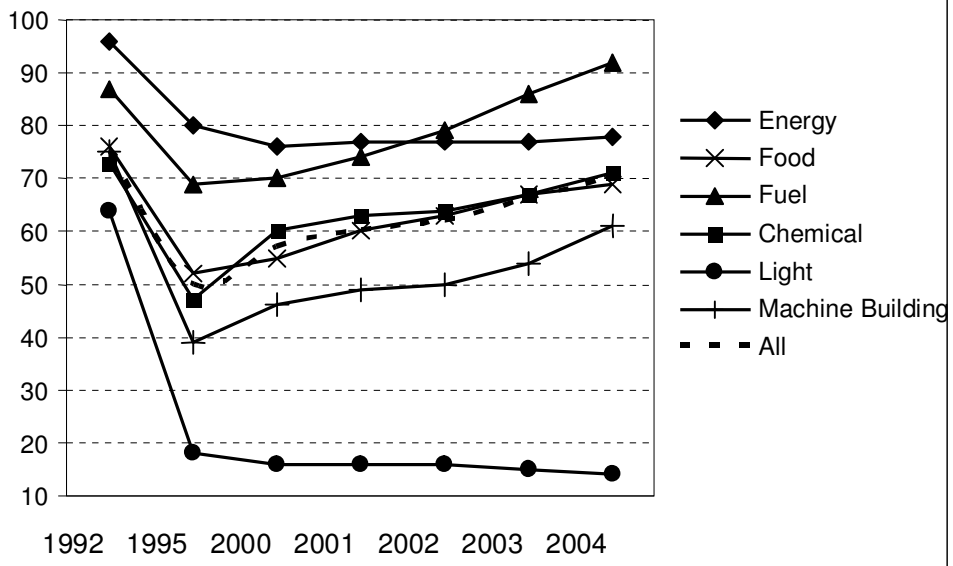
[19] Estimates exclude Evenki and Taymur autonomous okrugs - which were merged into Krasnoyarks Krai in January 2007.

Thus, as noted by previous commentators (eg Yemtsov 2003:10; Service 2003:539), there were two particular groups of losers among Russian regions during the period of perestroika and after: on the one hand, primarily agrarian regions with poor infrastructure on the southern edge of the federation, some of which (Dagestan, Ingushetia) were also adversely affected by being on the edge of the Chechnya conflict, and on the other hand, regions of heavy industry in Siberia (e.g. Chita, Irkutsk) which were exposed as uncompetitive by the freeing of prices after 1992, and which lacked the political clout to attract resources to protect either industrial activity or living standards during the period of economic recovery after 2000. Regional policies aimed at cushioning the negative impact of structural changes differed in scope, effectiveness and timing. IISP (2005) report shows that some regions continued to provide food subsidies (e.g. Ulyanovsk oblast and Tatarstan) while Moscow, Khanty-Mansi AO and Yamalo-Nenets AO continued to provide allowances and subsidies. The poorest regions lacked fiscal capacity to provide social protection. The Russian north and most regions in Siberia suffered especially badly as the 'northern coefficient' - compensating differential in regions with adverse climatic conditions - was phased out (Service 2003: 539). According to Hanson (2007), around 30% poorer regions regularly depend on transfers from the federal budget; one of the poorest regions, Tyva Republic, relied for 81% of its budgetary revenue on transfers from the federal budget. Per capita social spending was higher in regions with higher-than-average levels of GRP per capita and minimum subsistence level (Kuznetsova, 2005).

Adjustment to global market forces involved a shift (Figure 3) from non-tradables to tradables – involving, in Russia and a number of other countries, the substitution of unprofitable state manufacturing activities in both heavy and light engineering industry, mostly labour-intensive, by oil, gas and minerals exports, which currently account for a quarter of Russian federal GNP and over

80% of exports[20], but are highly capital-intensive and less productive of local linkage activities than manufacturing and construction[21], employing less people than the Russian railways (Hanson 2007) and unable to convert any significant part of the growth to which they give rise into livelihoods for poor households with limited skills.

Figure 3. Industrial Production Indices, 1992-2004
(1990=100)



The nature of this structural shift defines the nature of the gainers and losers from the adjustment process. The gainers were people with skills adapted to the requirements of the 'new' (capital- and skill-intensive) economy and regions intensive in natural resources, which attracted inward investment; the losers (the 'perverse cases' with increasing poverty levels) were individuals with low levels of skill unable to adapt to the demands of the 'new economy' and regions, some in the west and some on the eastern and southern periphery, which either never had any labour-intensive tradable activities or lost them with the onset of perestroika[22].

[20] Hanson 2007: Figure 4.

[21] A similar evolution towards a capital-intensive pattern of production as a consequence of adaptation to the global market – and once again, increases in poverty in many districts - is visible, with even more dramatic political consequences, in the Bolivia case study of our ESRC project (Mosley 2007)

[22] Data on output dynamics across industries show that machine building and light industries (textiles, leather, shoes, and furs) were severely affected, with the latter being almost wiped out east of the Urals and concentrated in the European part of Russia. By 1996, the industrial index dwindled by 70% (in relation to 1991) Ivanovo oblast (textiles), Moscow oblast and Pskov oblast (machine building). In the North Caucasus, industrial index fell by 77% in relation to 1991, in Karachay-Cherkessia and 84% in Dagestan Republics (mainly agricultural ethnic Republics). Chemical and metallurgical (ferrous and non-ferrous) industries (centred in Vologda, Lipetsk and Samara oblasts, Bashkortostan and Tatarstan Republics, and Krasnoyarsk Krai) declined

4. Explanations of poverty at the level of policy: regional-level analysis

How are we to understand these trends in poverty in Russia, national and regional, and what can be learned from them about possibilities for further reducing that poverty? A strong tradition in development economics, much developed by the World Bank's empirical research in the 1990s, answers: the best anti-poverty policy is a good pro-growth policy, or, in the words of the famous paper by Dollar and Kraay (2001, 2003) 'growth is good for the poor'. Dollar and Kraay's main result, derived from a cross-section of industrialised and developing countries, was that the elasticity of poverty (measured somewhat idiosyncratically as the share of the bottom 20% in national income) with respect to GDP growth was robustly negative, with a mean of minus one: in other words, a one per cent increase in GDP growth rate can be expected to yield a one per cent reduction in poverty. But growth of GDP, as revealed by much subsequent research (for example Ravallion 2001, Epaulard 2003, Mosley 2004; World Bank 2006; Besley and Cord 2007), is not always pro-poor: for example, between 1990 and 2005, ten of 47 (developing and transitional) countries which exhibited positive growth of per capita GDP between surveys experienced an *increase* in headcount poverty.

And within countries experiencing significant growth in GNP – even those which have experienced overall falls in poverty – the poverty of many regions and vulnerable occupational groups has deteriorated (Datt and Ravallion 2002 for India, and several country studies in Besley and Cord 2007). Such diversity of experience is particularly to be expected, and as we have already seen occurs, in Russia, the largest country in the world. Within Russia, only one study so far has examined inter-regional variations in poverty, namely Yemtsov (2003), which covers only the period of perestroika and negative growth between 1992-2000. Yemtsov finds that in Russia overall there is a orthodox negative growth elasticity of poverty – but, indeed, wide variations between regions, with a complete absence of inter-regional convergence. We now apply this approach to Russia's poverty experience through the subsequent period of oil boom and positive GDP growth. In particular, we seek to explain how Russia's recent poverty dynamics, as described in the previous section, varied across its federal subjects, and how those variations can be related to policies and institutions at the federal and local level. We can gain an initial impression of the regions where the return to growth did not improve living standards by means of a simple scatter-diagrams (Figures 3 and 4) of changes in poverty in relation to growth in income measured by Gross Regional Product (GRP). We begin by estimating a Dollar-Kraay growth regression for the Russian Federation separately during the periods of macro-economic decline (1996-1999) and recovery (2000-2005), periods between which, as we have seen, revisions were made to the method of calculating the overall poverty index.[23]

The general trend in Figure 4 is for majority of regions to experience a rise in poverty as income fell in the late 1990s. Although, as illustrated in that Figure, the overall relationship between these two variables (formally, the regression line linking percentage change in poverty to percentage change in income) was negative, with a slope, or 'poverty elasticity', of about minus 0.47)

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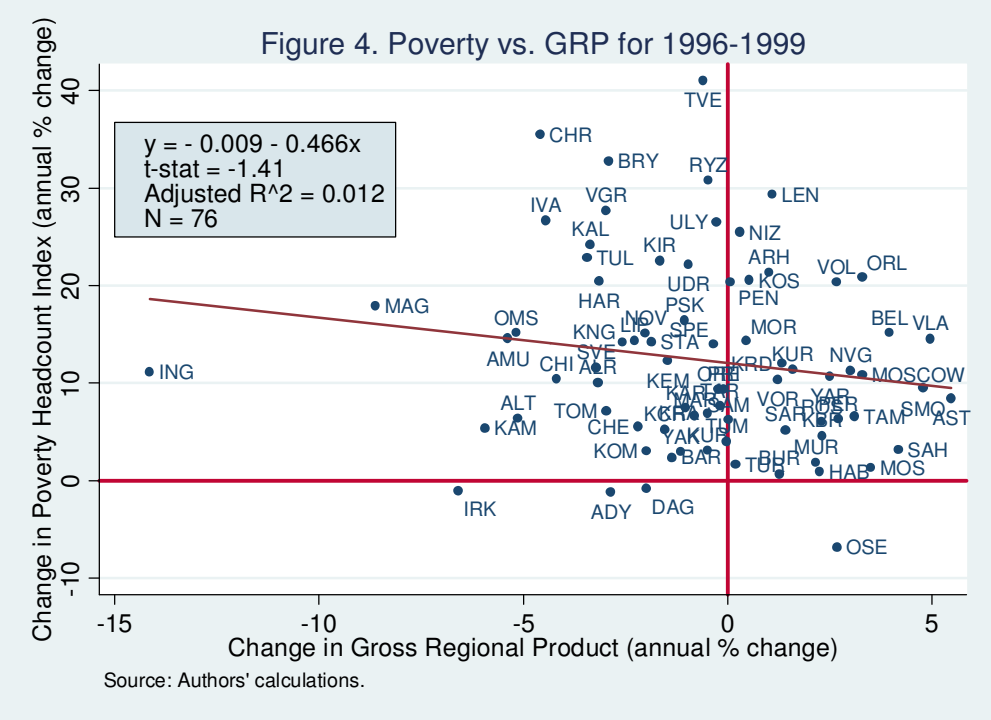
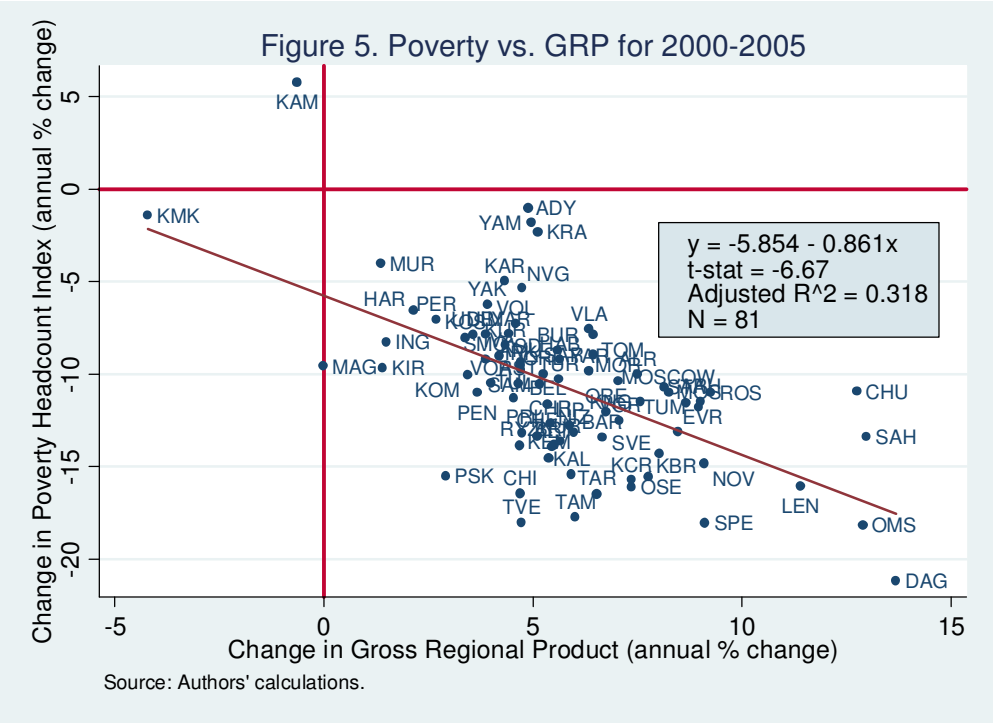
by 32-42% (IISP, 2007a).

[23] The estimates of coefficients derived from fixed-effects regressions and implemented with a set of time indicator variables are shown in textboxes.

this relationship did not by any means pertain universally across all regions. In thirty of the 76 'federal subjects', those in the bottom right-hand quadrant of Figure 4, rise in poverty levels was combined with rising GRP. However, the fixed-effects model results suggested an insignificant relationship between the headcount poverty rate and GRP. Yet the scatter-diagram assists in identifying regions where recovery was more rapid while poverty rose above levels of the mid-1990s. It is obvious that the 1998 crisis cased a new wave of destitution, albeit - short-lived, across majority of regions. In some regions (for instance, in Bryansk, Ivanovo, Magadan and Ingushetia) galloping poverty rate was coupled with stagnating economy.



As illustrated in Figure 5, most of Russia's regions experienced a decline in poverty once growth resumed in the early 2000s. The overall relationship between poverty and GRP was negative, with a slope, or 'poverty elasticity', of about minus 0.9. In seventy nine of the 81 'federal subjects', those in the bottom left-hand quadrant of Figure 5, poverty levels by 2005, after five years of growth in the federal economy, had fallen sharply. However, as we shall discuss below, the response of poverty to growth at the aggregate (federal) level is far below what it is in most other middle-income countries, or indeed globally, where the World Bank in 2006 estimates a poverty elasticity of about -2.5 (World Bank 2006, figure 4.3) The implication is that in majority of regions which returned to growth, the character of growth in some regions is such that the overall level of poverty decreases for less individuals. It will be a major task of the rest of this paper to understand why this is, and thereby to gain some understanding of the dynamics of poverty within the post-crisis Russian economy



Source: Authors' calculations.

As was illustrated by Figures 4 and 5, there was *in general*, across the 'federal subject' territories, a tendency for poverty, both in the pre- and in the post-2000 period, to decline as growth rates increased; however the proportionate rate of decline (the 'poverty elasticity') across the entire 1996-2005 period is only -0.53[24] – half the level estimated by Dollar and Kraay in the late 1990s and one-fifth of the central cross-section estimate of poverty elasticity presented in the 2006 *World Development Report* (WDR). Even in the period after 2000, it is only -0.86, or one-third of the *WDR* value. Moreover, in thirty of the 76 federal subjects in the 1996-1999 period, positive growth rates of GDP in particular regions were accompanied not by reductions in poverty but rather by increases: growth was of a type which was actually inimical to escape from poverty. These patterns are catalogued in Appendix Tables A1 and A2.

Why is the poverty elasticity low (by international standards) across the federation as a whole, and why is it perverse in a number of regions? One important reason for the low overall poverty elasticity, we would argue, is embedded in the characteristics of structural adjustment itself described in Section 3. Thus whether a particular region experienced a fall in poverty during the 2000-05 period depended on whether its local economy grew or not, and if it did grow, the rate at which this growth was converted into poverty reduction (the 'poverty elasticity') was dependent partly on its economic characteristics (whether the growth was of a kind which had a high propensity to suck in low-income labour) and partly on its political characteristics (whether the region was able to attract public expenditure and other policies which were capable of offsetting poverty, either through the labour market, or through increasing consumption standards (e.g. consumption and minimum wage policies) – policies which we collectively describe as the 'social efficiency wage': the

[24] We estimate fixed-effects model of the relationship between poverty and growth for the entire period.

elements in the allocation of public resources which impinge on political stability[25]. We have elaborated elsewhere the concept of the social efficiency wage and illustrated varying ways of using it in different country contexts (Hudson, Lenton and Mosley 2009). We propose, therefore, a hypothesis in which poverty dynamics within a particular region depend partly on that region's industrial structure – and in particular on whether that industrial structure impacted on the local labour market in such a way as to pull out of poverty those who had lost their jobs under perestroika - and partly on the effectiveness of the policy instruments which it deployed to support pro-poor tendencies within the labour market. In this paper these pro-poor instruments – the level of social expenditure, pensions and subsidies - are treated principally as an exogenous influence on poverty. They are modelled endogenously, and the political forces underlying them are explained in more detail, in a companion paper, Mussurov and Mosley (2007b). The essence of our story, however, is a chain with three links: the social efficiency wage and the pattern of structural change inflicted by *perestroika* determine the level of poverty: the instruments which comprise the social efficiency wage are determined by fiscal constraints, degree of democracy, and the desire to prevent political instability; and the risk of rioting and other forms of political instability is determined, as per the standard economics- of-conflict literature, by costs and benefits of rebelling against the state as well as by locally specific factors such as local institutional weakness and the politicisation of the opposition (Fiess et al. 2008). The linkage on which we focus here is the first, the determinants of the poverty elasticity. We now conduct a regression analysis on this relationship, with a view to understanding the inter-regional variations portrayed in Figures 3 and 4.

5. The Model

The general argument is that the low overall poverty elasticity of growth in Russia represents a potential political liability for the government, as it is symptomatic of the emergence of an underemployed underclass lacking the skills to hold down jobs in the new, albeit rapidly-growing, economy, and constituting a political threat especially if this poverty combines with other grievances. In those regions where a perverse poverty elasticity combined with ethnic or other demands for autonomy, the federal state was vulnerable, and might be expected to pump resources into such regions to pre-empt politically destabilising action. The resources which it injected might come in various forms – subsidies on the prices of 'sensitive' items such as food and heating fuel, pensions, variations in the mix of public expenditures, and variations in the minimum wage. Collectively we refer to these alternative channels for injecting public resources into the economy as the *social efficiency wage* – an increase in the social wage designed to achieve greater economic stability, by analogy with the private efficiency wage of labour economics, in which increases in the private wage achieve increases in the stability and productivity of the labour force.

Our model visualises a government determined, in whatever way it can,

[25] The optimal level of the social efficiency wage is the social wage which minimises political instability and thus maximises the probability of the ruling party staying in power, just as the private efficiency wage maximises the stability and hence the productivity of the labour force (Mosley 2007).

to maximise its chances of retaining its hold on power [26], and using the social efficiency wage as an instrument to enable it to do this. We assume that the government's hold on power will be improved by economic success (e.g. high rates of economic growth) but damaged by political instability. A high level of civil disruption combined with poor economic performance is a calamity for any government, and defines a 'disaster zone' in which the likelihood of holding on to power is very poor.

The significance of the social efficiency wage instrument, in this context, is that if correctly chosen it will increase the incumbent government's chances of keeping away from loosing its' grip on power. We reason that up to a certain point, increases in the social efficiency wage, mediated through any of the instruments previously described [27], will move the trade-off so as to give it a better change of holding on to power. How effectively a government is able to do this depends on how well it is able to gauge the impact of changes in expenditure, through the channels of influence identified earlier, on the sensitivities of local interest groups.

The government, therefore, maximises a utility function consisting of two elements: the size of the investible surplus, hence the growth rate (X) and risks to political stability (R).

$$U = f_1(X, R) \qquad \textbf{(1)}$$

In (1) the investible surplus X is simply the difference between the marginal product of labour (L) and its cost, which consists of the wage (w) plus any social efficiency wage premium (p) that is paid:

$$X = g(L) - w - p \qquad \textbf{(2)}$$

The growth rate of labour productivity, $\partial g(L)/\partial t$, depends fundamentally on the standard factors of production of the new growth theory literature (capital K, skills H, initial income Y_0, etc); but also on the risks of political instability, R.

$$\partial g(L)/\partial t = f_2 (Y_0, K, H; R) \qquad \textbf{(3)}$$

The risks to political stability, including the associated risk of conflict, depend on initial conditions (social capital, inequality σ, history of conflict C, etc), and on incidental shocks (S). But they also, and this is the main novelty of our approach, depend on the size of the social efficiency wage premium (p) which is paid:

$$R = f_3 (I(\sigma, C), S, p) \qquad \textbf{4)}$$

Within this expression, the impact of the social efficiency wage, p, on political instability, R, is the aggregate of its impact on specific social and occupational groups. Thus for social groups 1, 2…n,

[26] Appropriate behavioural assumptions for governments depend on decision-making mechanisms within government. See Drazen (2002, Chapters 2 and 3).

[27] Changes in the expenditure mix, changes in the level of social expenditures, variations in pensions, and variations in subsidies/price controls seem to be the alternative formulations of this instrument most practised in Russia.

$$dR/dp = ((\partial R_1/\partial p_1)dp_1 + (\partial R_2/\partial p_2)dp_2 + \ldots + \partial R_n/\partial p_n)dp_n \quad \textbf{(5)}$$

and the key element in the setting of p consists in its allocation between different interest-groups. It will already be clear that the determination of the social efficiency wage depends on the relative perceptions, militancy and social leverage of different groups and specifically, in this context, on the ability of government to reduce the risk of blockage or rebellion by specific social groups, $\partial R_i/\partial p_i$, by varying the element of the social efficiency wage which pertains to each of them. In the limiting case, if only one group is able to exercise influence, its preferences will dominate in determining the social efficiency wage; but typically its value will be determined by a process of coalition formation between different social groups (de Janvry, Fargeix and Sadoulet (1993)).

Thus the recipient government maximises (1) subject to the requirement that the risk of conflict, which we see as proportional to the *ratio* of expected gain to expected loss, not fall below some disaster level [28]:

$$R < R^* \quad \textbf{(6)}$$

Thus, maximising government utility ((1)) subject to the constraint (6) and incorporating expressions (2) through (5), the optimal level of the social efficiency wage premium, p*, is the value of p which solves

$$\frac{\partial(X - R)}{\partial p} - \lambda[R - R^*] = 0 \quad \textbf{(7)}$$

This solution condition reduces to:

$$(\partial/\partial p)\left[f_1(f_2(Y_0, K, H; R(p)) - w - p) - f_2((I(\sigma, C), S, p) - \lambda[f_2(I, S, p) - R^*]\right] = 0 \quad \textbf{(7')}$$

In other words, the optimal level of the social efficiency wage depends on initial conditions (inequality, social capital and past conflict history), the parameters of the aggregate production function (initial income, physical and human capital) and the impact-coefficients of social expenditure in favour of particular interest groups, p, on the risk of political instability, R:

$$p^* = f\left((I(\sigma, C)), S; Y_0, K, H; \partial R_1/\partial p_1, \partial R_2/\partial p_2, \ldots \partial R_n/\partial p_n\right) \quad \textbf{(8)}$$

Further, from (3) the reduced form for the growth of productivity is:

$$\partial g(L)/\partial t = f_2(Y_0, K, H; f_3(I, S, p^*)) \quad \textbf{(3')}$$

where p* is the value of p which solves (7')

An issue of particular interest is whether, in particular environments, the social efficiency wage reflects the preferences of the poor, so that it becomes good politics to practise expenditure policies which benefit low-income people.

[28] This is exactly the same approach as that taken in chapter 7 of Mosley et al (2003), where the farm household maximises utility subject to the requirement that income (or assets) not fall below some 'disaster' level.

In the stabilisation and adjustment literature, there is a tradition of arguing that since the poor are not the most militant, and lack political leverage and resources, this is unlikely to be the case [29]. However, this tradition may now be incorrect: if the nonpoor see it as in their interest to form coalitions in support of policies which will promote the interests of the poor as well as theirs (such as universal primary education, in developing countries), or if there are powerful pro-poor external actors (such as non-governmental organisations and aid donors in developing countries) willing to exercise leverage in support of pro-poor expenditure patterns, then the adoption of a pro-poor expenditure mix will be politically attractive and will reduce instability.

What is the likelihood that the adoption of 'politically efficient' social efficiency wage policies, p*, will result in a pro-poor outcome? In Mussurov and Mosley (2007), we argue that the pro-poor impact of the prevailing growth pattern will be determined by, first, the representation of the poor in the setting of the social efficiency wage and second, the ability of the (private-sector) growth process to reduce poverty, which we treat as related to capital-intensity.

Our main empirical and policy interest in what follows will be to establish the driving forces behind the level of poverty. Thus, in the first paper, we estimate reduced form poverty equation (see Mussurov and Mosley 2007 for extended applications of this model), using a dependant variable - Headcount poverty rate (*Pov*). We explore the determinants of poverty in the context of a dynamic-panel data model from the following regional-level specification:

$$Pov_{i,t} = \alpha Pov_{i,t-1} + X'_{it}\beta + \varepsilon_{it} \qquad \textbf{(9)}$$

$$\varepsilon_{it} = \mu_i + \nu_{it}$$

$$E[\mu_i] = E[\nu_{it}] = E[\mu_i \nu_{it}] = 0$$

where *i* indexes regions and *t* indexes time periods. *X* is a vector of controls, containing the "social efficiency wage" (*SEW*) and a proxy for capital-intensity (Energy*ind*).[30] The disturbance term (ε_{it}) has two orthogonal components: the fixed effects, μ_i, and idiosyncratic shocks, ν_{it}.

To control for the possible correlation between lagged dependent variable and the error term as shown by Nickell (1981), equation (9) is expressed in the first difference form. Subtracting $Pov_{i,t-1}$ from both sides of equation (9) gives the following transformation:

$$\Delta Pov_{i,t} = (\alpha - 1)Pov_{i,t-1} + X'_{it}\beta + \varepsilon_{it}$$

First-differencing the data removes region-specific fixed effects but there is still correlation between the differenced lagged dependent variable and the

[29] 'A focus on social equity is not necessarily relevant to understanding the politics of adjustment, because the politically most active groups are not usually the poorest' Haggard, Lafay and Morrisson (1995, p. 120).

[30] For a definition of the variables, see the Data Appendix.

disturbance process. To estimate equation (9), we apply the dynamic panel data GMM derived by Arellano and Bond (1991) and augmented Arellano-Bond estimator modified by Arellano-Bover (1995) and Blundell and Bond (1998). The Arellano-Bover/Blundell-Bond estimator augments Arellano-Bond by making an additional assumption, that first differences of instrument variables are uncorrelated with the fixed effects. This allows the introduction of more instruments, and can dramatically improve efficiency. It builds a system of two equations, the original equation as well as the transformed one, and is known as System GMM.

As discussed by Roodman (2006), both are general estimators designed for situations with 1) "small T, large N" panels, meaning few time periods and many individuals; 2) a linear functional relationship; 3) a single left-hand-side variable that is dynamic, depending on its own past realizations; 4) independent variables that are not strictly exogenous, meaning correlated with past and possibly current realizations of the error; 5) fixed individual effects; and 6) heteroskedasticity and autocorrelation within individuals but not across them. In sum, the estimators (Difference and System GMM) handle fixed effects and endogeneity of regressors, simultaneously avoiding dynamic panel bias shown by Nickell (1981).

6. Empirical Results

Assuming the log-linear relationship, the Difference GMM System and GMM results are displayed in Tables 8 and 9. As our panel is unbalanced, we used orthogonal deviations to transform the data. [31] To reduce the instrument count, we limit the number of instruments generated in both Difference GMM and System GMM estimates. Our poverty equation expresses poverty as a function of the propensity to take on low-income labour (the capital intensity) of the regional economy, and of the level of the social efficiency wage. The first column in Table 8 shows the results of the one-step Arellano-Bond estimator determining the level of poverty, and the last two columns estimates the model by cutting the instrument count.

Treating independent variables as weakly endogenous and using regional tax revenue [32] - in addition to a time indicator variable – as an instrument, we observe that poverty responds negatively to the regional level of the social efficiency wage. However, the full-instrument variant in column (1) produces insignificant coefficient of the lagged levels of ΔLn(*SEW*). The Hansen test shows implausibly perfect *p* value of close to 1.00, the classic sign of instrument proliferation (Roodman, 2008). Cutting the number of instruments leads to the estimates presented in the last two columns. Columns 2 and 3 suggest that both of these variables (*SEW* and *Industry*) are significant in determining poverty elasticity: poverty is significantly responsive to social expenditure, and to the salience of the industrial sector. We take (*Energyind)* as

[31] We use 1995-2004 regional-level data for 81 regions. See the Data Appendix for further details.

[32] Assumption is made that the percentage share of social expenditure (*SEW*) in regional budgetary expenditures is linked to regional tax revenues from corporate, personal income and property taxes. Fixed-effects estimates have shown positive and significant effect of the log of tax revenue on *SEW*. Data on per capita *SEW* - a preferred measure – is unavailable.

a proxy for capital-intensity: the oil and gas sectors, which accounted for 27% of output and 60% of the country's exports in 2006, employ fewer people than the Russian railways, and employ only 2 per cent of the employed workforce (Hanson 2007: 873-874). The *J*-test of overidentifying restrictions confirms that instruments are not strictly exogenous.[33]

Table 8. Difference GMM Regression of Poverty			
	Full instruments	*Second-lag instruments only*	*Collapsed instruments*
Ln(Pov_{t-1})	.773* (.04)	.830* (.052)	.851* (.054)
ΔLn(*SEW*)	-.241** (.108)	-.137 (.153)	-.240*** (.140)
Ln(SEW_{t-1})	-.050 (.049)	-.041 (.054)	-.081 (.054)
ΔLn(*Energyind*)	-.110* (.011)	-.122* (.013)	-.141* (.014)
Ln($Energyind_{t-1}$)	-.017*** (.009)	-.010 (.011)	.002 (.011)
Year	.011** (.004)	.011** (.004)	.015 (.004)
N of observations	615	615	615
N of groups	81	81	81
N of instruments	118	26	27
AB test for AR(1): Prob. > z	.000	.000	.000
AB test for AR(2): Prob. > z	.001	.006	.030
Hansen test (p value)	.991	.000	.000

Notes: All regressions are one-step Difference GMM. Robust standard errors in parenthesis.

Results from System GMM regressions are shown in Table 9. It will be useful to re-connect the findings of Table 13 with our Difference GMM model estimates. One striking difference between the Difference GMM and System GMM lies in statistical insignificance of the relevant coefficients. In particular, estimates in columns 2 and 3 suggest lack of statistically significant relationship between poverty and social expenditures. We also find that coefficients on lagged poverty levels are slightly higher. In column 4 we use two-period lags from the Holtz-Eakin, Newey, and Rosen (1988) collapsed instruments. The new point estimates of the coefficients on differenced and lagged poverty levels are statistically significant. We also find that proneness to poverty at regional level is significantly affected by the salience of the industrial and energy sectors

[33] Results of the Hansen test must be interpreted with caution as the *p* value appears suspiciously high. See Roodman (2008, pages 9-11) for the detailed arguments when a *p* value should be viewed with concern.

and confirmed by the positive and significant coefficient of Ln(*Energyind*$_{t-1}$). The difference test does not allow us to reject the null when instruments are lagged.

Table 9. System GMM Regression of Poverty				
	Full instruments	*Second-lag instruments only*	*Collapsed instruments*	*Collapsed second-lag instruments*
Ln(*Pov*$_{t-1}$)	.947* (.037)	.956* (.039)	.951* (.049)	1.182* (.111)
ΔLn(*SEW*)	-.103 (.086)	.047 (.100)	.097 (.129)	-0.697* (.217)
Ln(*SEW*$_{t-1}$)	.029 (.048)	.017 (.055)	-.033 (.051)	-.306* (.099)
ΔLn(*Energyind*)	-.108* (.012)	-.117* (.013)	-.143* (.015)	-.387* (.078)
Ln(*Energyind*$_{t-1}$)	.004 (.009)	-.0001 (.011)	.002 (.013)	.161* (.047)
Year	-.0003 (.004)	.003 (.004)	.010 (.004)	.045 (.011)
N of observations	697	697	697	697
N of groups	81	81	81	81
N of instruments	122	52	31	9
AB test for AR(1): Prob. > z	.000	.000	.000	.000
AB test for AR(2): Prob. > z	.001	.004	.033	.131
Hansen test (p value)	1.000	.006	.000	.294
Difference-Hansen tests (p values):	1.000	.987	.451	

Notes: All regressions are one-step System GMM. Robust standard errors in parenthesis.

In Table 9, the main policy factor is the behaviour of social expenditure, which is significantly greater in the 'orthodox' poverty-elasticity group, in which poverty declined sharply, than in the low and perverse poverty-elasticity group, in which poverty rose. Other factors favouring a positive poverty elasticity are: (i) a diversified local economy, with high levels of inward investment (Pskov, St Petersburg) (ii) a continuing secessionist threat and high levels of political protest activity (Ingushetia, Karachay-Cherkessia, Tuva) which tended to impel high levels of federal subsidy and local-level social spending, and (iii) the ability of the local tertiary education system to retrain people whose skills had been made redundant by the recession into the skills demanded by the 'new economy'. The politics underlying the differing local levels of social expenditure, and other elements of the social efficiency wage, are discussed in detail in our companion paper, Mussurov and Mosley (2007b).

We can illustrate this further by making three case-study comparisons between 'successful' and 'failing' regions, one for regions which were *always poor* prior to 1990 and one for *new poor* regions which had industrialised before 1990 but which fell sharply during the perestroika period. Within each

comparison we take two regions which had similar initial conditions (in the sense of 1995 levels of poverty and gross regional product), but evolved very differently thereafter.

The first comparison is between two 'new poor regions', with initial (1995) poverty rates of about 30% and quite high gross regional product: Pskov (in the north-west), where poverty has declined dramatically with the growth of the 2000s, and Ulyanovsk (on the Volga), where in spite of growth in real gross regional product, poverty levels have increased since 1995. Both regions, in terms of the terminology introduced on page 13, are 'newly poor' : they have, since the late nineteenth century and amplified by the Five-Year Plan periods, good infrastructure and a heavy concentration of economic activity within machine-building, all of it in the 1980s state-owned, and both as a consequence suffered heavily under perestroika in the 1990s. Their evolution since 2000 has been very different. Ulyanovsk, loyal to the man after whom it is named[34], maintained during the 1990s, under three different governors, elements of a command economy. de Melo and Ofer (1999: 13) describe it at that stage as being 'at the bottom of the list for reform', many of which it still maintains, including ceilings on profits and trade markups and restrictions on food exports to other regions, whereas Pskov's local administration is very heavily orientated towards the private sector[35]. In Ulyanovsk unlike Pskov there are very low levels of inward foreign investment (de Melo and Ofer 1999), and the main domestic industry, aircraft manufacture, has become so inefficient that 'even Aeroflot does not want to buy its low-quality airplanes' (Orttung et al 2000: 597). Indicators of social capital are also inferior in Ulyanovsk: unlike Pskov, it has very low access to non-government media: only local, primarily government-owned, newspapers are read, there are no privately-owned radio and television stations, and the local democracy indicator is much higher in Pskov than in Ulyanovsk. Although we must be cautious about inferring causation from these data, the superficial impression is that Ulyanovsk is caught in a low-level poverty trap, with the authorities' response (repression of both the media and the private economy) deterring foreign investment, inhibiting diversification of the local economy, and disincentivising the formation of both human and social capital, including those skills required to put any momentum behind progressive reform at the local level. All of these resource constraints prevent the labour market from growing quickly and responding to the needs of the new globalised economy, and this, we speculate, was a major cause of persistence in the differing dynamics of local poverty levels.

Next we compare two regions of Siberia. The 'improving' region is Chita, an important base of the military-industrial complex in Siberia on the Trans-Siberian railway quite close to the Chinese border, and the 'declining' region is Khakassia, on the upper Yenisei river in central Siberia. Four relevant points of contrast are the trend of private investment – close to zero in Khakassia but increasing much more rapidly in Chita; (2) the labour market -dynamic and flexible in much of Chita (much of its workforce consists of Chinese immigrants

[34] Lenin's true name was Vladimir Ulyanov; 'Lenin' was a pseudonym assumed years after he became a political activist (Service 1997:70).

[35] Although orientated towards the private sector Pskov is a mixture of new-style entrepreneurship, encouraged by the region's nearness to St Petersburg and the EU Baltic states, and old-style oligopoly and patronage, much of it centred on the oblast-owned alcohol production monopoly, Pskovalko (Orttung 2000:442, Dininio and Orttung 2005)

willing to accept jobs at a lower rate than Russians) and rigid and monopsonistic in Khakassia (which is basically a 'company region', almost entirely devoted to the production of aluminium); and (3) political orientation – relatively radical in Chita - the city has had a radical tradition ever since 1825 when it provided a sanctuary for the Decembrists (participants in the attempted rebellion intercepted and punished that year by Nicholas I). Even now support for United Russia in this 'city of exiles', as it is widely known, is, by contrast with Khakassia, well below the national average.

Finally we consider two 'always poor' regions with headcount poverty rates of over 50%, an agrarian economic base and poor infrastructure, both of them in the Muslim-dominated south Caucasus zone (see Figure 12.7). These are Ingushetia, adjacent to Chechnya, which has reduced poverty substantially since the late 1990s, and the Kalmyk Republic, which has experienced an increase in poverty. The major observable policy difference is that Ingushetia has experienced a larger inflow of federal spending – indeed 88% of its budget is provided by the federal government[36]. This is a loyalty bonus which rewards the fact that Ingushetia, unlike Chechnya, did not rebel during the 1990s. Financed by this bonus, social spending has grown rapidly since the 1990s, and there has also been a greater diversification of the fundamentally agrarian economy into petrochemicals and oil and gas derivatives. In essence Ingushetia and its neighbour Dagestan, like many African countries, have in the 2000s been experiencing aid-led growth – the aid in this case being provided by subsidies from the federal administration. None of this has improved the quality of governance, which on one account 'is widely regarded by its people as a kleptocracy kept in power by military force, electoral fraud and Russian support'[37]; yet even Ingushetia has a lower democracy index than the Kalmyk Republic, whose President, Kirsan Ilyumzhinov, more than rivals Ingushetia in political violence and has poured much of his republic's investible resources into a string of white elephant projects, including four personalised white Rolls-Royces, a virtual casino open to anyone with access to the international computer network, a gold-plated statue of Buddha, and a 'chess complex' designed to put Kalmykia on to the map as the chess tournament capital of Russia[38]. Finally, it must be stressed that one key element in Ingushetia's standing as the most improved performer poverty-wise in Russia is a simple bounce-back from the appalling levels of destitution encountered during the mid-1990s as the consequence of much of the capital stock being destroyed by the civil war.

The implication, requiring further investigation, is that the areas suffering from perverse poverty elasticities (eg Ulyanovsk, Ivanovo, Krasnoyarsk among the new poor group; Kalmykia among the old poor group) lacked the political impetus, and as a consequence did not inject the fiscal and human resources, required to impel and diversify the economy into a pro-poor pattern of growth. It may also be that in some regions (eg Chita) the resilience of private production on small subsistence plots, which for many was a key factor in buffering livelihoods in face of job loss under perestroika has helped keep the pattern of

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[37] *The Independent,* 3 September 2008, p22, the source of this quotation, reports the murder on 1 September of Magomed Yevloyev, the owner of a website critical of the Ingush government.

[38] 'Overall, [Ilyumzhinov] owns 36 cars which are garaged in a variety of cities around the world so that the president can use them when he travels.' Orttung (2000):177.

growth pro-poor. It must be emphasised that, at this stage, our hypotheses concerning the determinants of poverty elasticity (except for social expenditure, on which the evidence is quite strong) remain well short of fully established.

7. Conclusion

The impact of recovery from the severe recession of the 1990s has been regionally very diversified and varied with the indicator of well-being chosen. For the federation as a whole, headcount poverty began to diminish in 2000, but indicators of mortality and morbidity took longer to turn positive, and although the increase in inequality has now hit a plateau, it has not yet begun to diminish, and some dimensions of this indicator, in particular inequality between men and women, are still getting worse.

The extent of poverty reduction has varied enormously, with some regions continuing to experience increases in poverty even though they have returned to growth. We attempt to understand and analyse the reasons for this regional variation. We focus on two principal causative factors: the changes in economic structure resulting from the liberalisation of the economy, and policy instruments aimed at poverty reduction. Many regions which experienced structural change under *perestroika* (notably those benefiting from the current oil and gas boom) experienced massive growth in GDP but little poverty reduction, because their prevailing production function is capital-intensive and thus they were unable to transmit much or any reduction in poverty through the labour market. And in a number of cases, even highly qualified and skilled individuals who lost livelihoods during the rationalisation of the state sector in the nineties were unable to gain them, and remained poor, during the recovery period to date. Regions where the growth of the early 2000s was based more on the service sector tended to be more effective at generating poverty reduction.

In certain cases, even if the prevailing production function was not poverty-reducing, it could be made more so through public policies – 'social efficiency wage policies', as we refer to them - which either subsidised consumption, or either indirectly or directly created employment. Under this heading we examine the levels of social expenditure, [subsidies and pensions]. We find that the regional poverty elasticity is directly related to levels of 'social efficiency wage policies' of this type, and that social expenditure is, in a number of regions, responsive to indicators of social unrest, including votes for the opposition party, which is in turn directly related to unemployment (Table 4). Thus political action, potentially and in some regions, acts as a safety-valve – the political tensions caused by failure to relieve poverty in some regions have led to political actions which have raised the ability of growth to moderate poverty and thereby made the region more stable. This mechanism must not be over-dramatised, but it acts, as illustrated by the case studies of Table 5, as a significant corrective factor to the weak pro-poor impulse of the economy in a number of regions. Actions aimed principally at protecting the security of central and regional government have in several cases, it seems, had a distinct pro-poor spin-off.

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Data Appendix

We used two data sources in this paper. Our first sample was drawn from the bimonthly Monitoring of Economic and Social Changes public opinion survey conducted by the Russian Centre for Public Opinion Research (or VCIOM, its Russian acronym) in July and September 2000-2004. Each VCIOM survey covers around 2,500 individuals aged 16 and above; multistage stratified sampling technique was used to ensure that a representative sample of the national population was polled. Interviews were conducted in all of the country's economic-geographical regions, including Moscow and St. Petersburg. Some of the territorial-administrative regions in the South Caucasus (due to the military conflict in Chechnya, Ingushetia, Dagestan, and Northern Ossetia) and in the Far North (due to remoteness of Kamchatka, Chukotka, Sakhalin, and some of other autonomous okgruks) were excluded.[39] Data were collected, among other things, on a range of basic demographic and education indicators; labour market behaviour and outcomes; voting behaviour, the level of trust in government institutions, political parties and politicians; protest potential in different social groups and attitudes toward reform. Summary statistics for the VCIOM data are given in Appendix Table A.1. The original survey oversampled Muscovites by around 300 respondents. In the estimates shown in Tables 3-5, we use individual weights provided by the Levada centre to account for this problem. We do not use sample weights in our regression analyses. In Panel B, identification in the selection equation is achieved by including additional variables: number of working household members (*Working members*) and twelve dummy variables that indicate different sources of income as reported by respondents (*Primary job, Secondary job, Self-employment, Informal job/pension, Stipend, Child benefit, Cash transfers, Subsistence farm, Rent, Property sale, Shares/ interest*). In the Heckman and PSM estimates shown in *Panel B* and *Panel C*, the regressand (*Family income*) is an indicator variable.

In the GMM estimates, the regional-level data source is the '*Regiony Rossii*' ('Regions of Russia') annual publication by the FSSS. The publication contains major indicators that feature social and economic development of the subjects of the Russian Federation. The yearbook contains statistics on demographic and ecological situation in the regions, employment and unemployment, money income and consumer expenditures of population; health care, education and culture, housing, criminal situation; investments, indices of prices (tariffs) for goods and services. Statistics of industries of the economy by regions and information on budget revenues of the regions of the Russian Federation as well as crediting and deposits of population are presented. Summary statistics for the *Regiony Rossi* data are given in Appendix Table A.2. We use regional-level data from consolidated budget expenditures to create predictor variables: share of regional expenditures on industry/energy (*Energyind*) and total regional-level budget revenue (*Revenue*).

[39] See: http://www.levada.ru/eng/monitoring.html for further details of the sampling frame.

Appendix Table A.1. Summary Statistics for the VCIOM data.								
	July/Sep 2000		July/Sep 2002		July/Sep 2004		July/Sep 2006	
	Mean	*Std. Dev.*	*Mean*	*Std. Dev.*	*Mean*	*Std. Dev.*	*Mean*	*Std. Dev.*
Reported Income	1577.08	1949.82	2131.51	2750.52	1634.63	1508.66	1732.55	1596.72
Heckit Income	1625.76	1901.72	2269.35	3012.07	1677.47	1495.99	1759.87	1551.51
PSM Income	1642.96	2122.1	2263.71	3102.05	1682.10	1553.71	1751.86	1604.51
Age	45.60	17.72	45.82	18.33	44.99	18.29	45.04	18.34
Age2	2393.67	1708.48	2436.01	1765.76	2359.62	1757.62	2365.72	1762.08
University	0.23	0.42	0.23	0.42	0.23	0.42	0.25	0.43
Specialised	0.27	0.44	0.25	0.43	0.26	0.43	0.26	0.44
Vocational	0.11	0.32	0.12	0.33	0.38	0.48	0.12	0.32
Secondary	0.17	0.38	0.21	0.40	0.20	0.40	0.20	0.40
Moscow	0.17	0.38	0.18	0.38	0.17	0.38	0.17	0.38
St. Petersburg	0.02	0.16	0.02	0.16	0.02	0.16	0.02	0.16
Rural	0.22	0.41	0.22	0.41	0.22	0.41	0.22	0.41
Female	0.63	0.48	0.61	0.48	0.62	0.48	0.64	0.47
Family income	0.91	0.28	0.90	0.29	0.92	0.25	0.92	0.25
Working members	1.26	0.99	1.30	1.02	1.36	1.04	1.33	1.02
Primary job	0.66	0.47	0.68	0.46	0.70	0.45	0.70	0.45
Secondary job	0.06	0.24	0.08	0.27	0.09	0.28	0.08	0.28
Self-employment	0.03	0.19	0.04	0.19	0.03	0.17	0.03	0.18
Informal job/pension	0.07	0.26	0.09	0.29	0.08	0.28	0.07	0.27
Stipend	0.47	0.49	0.49	0.49	0.46	0.49	0.46	0.49
Child benefit	0.04	0.20	0.04	0.21	0.05	0.22	0.03	0.19
Alimony	0.15	0.36	0.01	0.11	0.01	0.11	0.01	0.13
Cash transfers	0.01	0.13	0.16	0.36	0.15	0.36	0.12	0.32
Subsistence farm	0.07	0.26	0.01	0.12	0.02	0.14	0.01	0.13
Rent	0.04	0.21	0.05	0.23	0.05	0.23	0.06	0.23
Property sale	0.008	0.09	0.03	0.17	0.02	0.14	0.01	0.13
Shares/interest	0.01	0.11	0.01	0.12	0.01	0.13	0.01	0.13
N	4,814		4,739		4,815		4,816	

Appendix Table A.1. Summary Statistics for the *Regiony Rossii* data.

Variable		Mean	Std. Dev.	Min	Max	
Log *Poverty*	overall	3.42	0.39	1.98	4.55	N = 781
	between		0.34	2.14	4.43	n = 81
	within		0.22	2.76	4.11	T = 9.64
Log *SEW*	overall	3.82	0.22	2.26	4.33	N = 789
	between		0.17	2.91	4.09	n = 81
	within		0.17	2.53	4.44	T = 9.74
Log *Energyind*	overall	1.05	1.12	-3.50	3.64	N = 788
	between		0.55	0.06	2.97	n = 81
	within		0.99	-3.94	3.34	T = 9.72
Log *Revenue*	overall	8.69	1.15	4.88	12.88	N = 790
	between		0.89	6.93	11.68	n = 81
	within		0.75	6.57	10.39	T = 9.75
Year	overall	1999	2.87	1995	2004	N = 790
	between		0.54	1999	2002	n = 81
	within		2.84	1995	2004	T = 9.75