

Speed of Reform, Initial Conditions or Political Orientation? Explaining Russian Regions' Economic Performance

RUDIGER AHREND

Abstract

Using a panel of 77 Russian regions we investigate the reasons behind large differences in regional growth performance for the period from the start of transition to the 1998 crisis. We consider politico-institutional characteristics, indicators of regional economic reform and initial conditions (including economic, geographical and structural features). Surprisingly, differences in institutional characteristics or economic reform explain relatively little of the observed difference in regional growth performance. For example, we find no evidence that a region's economic performance has been influenced by the political orientation of its leaders, or the political preferences of the population. In contrast, a region's initial industrial structure, as well as its natural and human resource endowments, had a large impact on its economic growth performance during the 1990s. It is important to note that our findings should not be interpreted as saying that reform in transition countries is generally less important than initial conditions, nor that reform in Russia was not or is not needed. Our focus on Russian regions captures only the aspects of reform that have (or have not) been initiated in the regions, and thus does not take into account the large—and arguably more important—part of the changes that have been undertaken at the national level. However, our study shows that regional differences in reform played a minor role in determining the relative economic performance of Russian

Dr. Rudiger Ahrend, OECD, 2, rue Andre-Pascal, 75775 Paris Cedex 16, France. Email: Rudiger.Ahrend@oecd.org. A substantial part of this work was undertaken by the author before joining OECD while at London School of Economics, DELTA (Paris) and RECEP (Moscow). The views expressed in this article are those of the author and do not necessarily reflect those of the OECD or the governments of its member countries. I would like to thank Erik Berglof, Tim Besley, Knut Eggenberger, Guido Friebel, Sergei Guriev, Irena Grosfeld, Nadia Ivanova, Vincent Koen, George Pavlov, Mark Schaffer, Koen Schoors, Claudia Senik-Leygonie, Constantin Sonin, William Tompson, Jacek Rostowski, Thierry Verdier, Charles Wyplosz, Ksenia Yudaeva and Ekaterina Zhuravskaya, and more generally all members of RECEP and CEFIR, as well as participants in the CEPR 99 Young Economist's Transition Workshop and the 2000 CEPR/WIDER Transition Conference for many helpful remarks and discussions. I am equally indebted to Michael Sulyaev and Tatyana Butova for their help with data. My very special thanks go to Yury Andrienko and Konstantin Kozlov for their excellent research assistance, which has been crucial in collecting the data for this work and preparing the result tables. Finally I would like to thank Roland Nash and MFK Renaissance for generously sharing data with me. The usual disclaimer applies.

regions in the 1990s, especially when compared with the impact of the initial conditions in which regions found themselves at the beginning of the transition.

The regional disparity in Russia's economic performance during transition is striking. While between 1994 and 1997 gross regional product (GRP) grew an average of 31% in the ten best performing Russian regions, with Moscow (+76%) topping the league, it declined by 27% on average in the ten worst performing ones, with Birobidzhan (−51%) being the worst performer. Over the whole period of transition from 1990 to 1998 industrial production fell by 78% on average in the ten worst performing regions, while it declined only by an average of 30% in the top ten.

The aim of this study is to investigate the main causes behind the hugely differing growth rates for the period from the start of transition to the 1998 crisis. Using panel data for 77 Russian regions for 1990–1998, we study the impact of three groups of variables¹ on regional economic performance. First, we consider politico-institutional features, among them governors' political orientations, measures of institutional efficiency and proxies for the risk of violent conflict. Second, we look at indicators of economic reform, such as the degree of privatisation and price liberalisation, or the level of subsidies. Third, we consider initial conditions,² including economic, geographical and structural features. Our main findings are the following. First, neither differences in the depth of economic reform nor politico-institutional variables explain much of the variation in regional performance. Second, we find that the initial structure and competitiveness of a region's industry, or a region's human capital and natural resource endowments, are an important determinant of a region's economic performance. In addition, more urban places generally experienced higher growth rates.

This study is related to the large empirical literature on the determinants of growth.³ While we think that in principle it is preferable to estimate an equation that is based on some form of augmented and dynamised production function (e.g. as in Mankiw, Romer & Weil, 1992, or the Solow & Swan model), in this study we use an approach that is somewhat laxer, as we do not focus on *how* variables impact on growth but rather on *which* variables are important for growth performance (as e.g. in Barro, 1991). The justification for this is twofold. First, we think Russian regional capital stock (and investment) data to be of particularly low quality. Economists have been sceptical about the relevance of capital stock measurements for the early years of transition in all transition countries, and the quality of regional capital stock data is even worse than that of national data. Moreover, in a period when output was falling at tremendous speed, capital stock data (derived from accounting) do not seem to properly reflect the size of the capital stock that was actually in use in the economy. Hence, as a more theoretically based approach relies crucially on some form of data regarding capital stock or changes in it, it seems very problematic to adopt such an approach in our case. Second, even if these problems could be overcome, it would not help us much in answering the question we are really interested in. If we were able to obtain reasonable yearly estimates of capital stock used in regional production, and if, for example, we found that a large part of the differences in economic growth were due to changes in effectively used capital stock, this would only change our question. Instead of explaining to what degree different variables might account for differences in growth performance, we would be left with the question to what degree these variables can explain whether capital stock (or the labour force in a region) continued to be productive. While this is not an uninteresting question in itself, it would be even

harder to answer given the available data, and we thus take a short-cut by looking at the determinants of growth performance directly, while neglecting the role factor accumulation (or destruction) may have played.

This study is loosely related to the debate about whether initial conditions or the amplitude of economic reform explain more convincingly the different economic performance of transition countries.⁴ The main difference with respect to this dispute is, however, that our focus on Russian regions captures only the part of reform that has (or has not) been initiated in regions, and thus does not take into account the large—and arguably more important—part of the changes that have been undertaken at the national level. Thus our findings should not be interpreted as saying that in general reform in transition countries is less important than initial conditions, nor that reform in Russia is not needed. However, our study shows that regional differences in reform played a minor role in determining the relative economic performance of Russian regions in the 1990s, especially when compared with the impact of initial endowments and industry structure.⁵

The first study of Russian regional performance during transition was made by Berkowitz & DeJong (1999), who claim that for the 1994–96 period the Russian regions that advanced faster on reforms had a larger share of private small enterprises, which in turn led to higher income growth or, at least, lower declines. However, their claim is not robust when using other measurements of output such as gross regional product. Their findings probably do not reflect any economic reality but are driven by a peculiarity in the way the Russian statistical agency calculates income.⁶

Mikheeva (1998) and Popov (1999b) report results closely related to parts of our work. Popov argues that initial conditions, measured by resource advantages, played a significant positive role in determining changes in output and income,⁷ whereas Mikheeva finds initial export shares to be highly important in explaining differing regional performance. In comparison with the aforementioned studies, the main advantage of our study can be found in its much wider, and more systematic and careful econometric approach.⁸

We first describe the methodology used, and then discuss the econometric results from the 'core regressions'. The next three sections present the main results for—respectively—politico-institutional features, measurements of economic reform and initial conditions. At the beginning of each section we state and motivate our hypotheses, and then present the econometric results. Finally we discuss the robustness of our results. The Appendix gives an exact listing of all variables used in our work, as well as those detailed regression results not presented in the main text.

Methodology

Russia's federal structure provides an interesting opportunity for econometric research, as it allows us to investigate the consequences of different politico-institutional settings, as well as those of varying economic policies, in entities with an almost identical judicial and cultural framework. Studies of Russian regions can thus avoid the main criticism of cross-country studies, namely their failure to account properly for large differences in attitudes and cultures.

In this study we use a panel of 77 Russian regions from 1990 to 1998. Our data set includes all *oblasti*, *kraya*, republics and the two independent cities (Moscow and St Petersburg), with the exceptions of Chechnya and Ingushetia, for which data are only sporadically available. The data for the ten autonomous *okruga* are included in their surrounding region, as sufficient separate data are unavailable. Unfortunately

data on GRP (gross regional product) growth, which is by far the best measure of economic performance, are only available since 1995. We therefore use data on real income and industrial production growth as additional proxies for regional growth. Real income is problematic insofar as it depends partly on changes in cross-regional transfers, and hence might not always properly reflect a region's economic performance. Industrial production is the most problematic measure, insofar as it does not cover the whole spectrum of economic activity, and is biased towards the performance of large-scale industry. Moreover, a shift from industrial production to service activities would be an expected development during the transition process, at least to some degree. Nevertheless both measures have the advantage of larger data availability. Data on real income growth are available since 1994 and industrial growth even since 1991, thus making it possible to assess the 'total decline' from the start of transition to the financial crisis in 1998. Therefore they provide a means of supplementing the study of GRP growth.

Our estimations are based on the following 'model':

$$\Delta y_{it} = \beta_0 + \beta_1 * CV_i + \beta_2 * OV_{it} + \beta_3 * \mu_t + \nu_i + \varepsilon_{it}$$

where Δy is the growth rate⁹ of per capita GRP or one of the other two measures of regional performance that we use as proxies for economic growth. *CV*, the Core Variables, are a group of variables that we include in each regression, whereas *OV*, other variables, are variables that we add one at a time or in related groups to different regressions. The μ_t are time fixed effects, and the ν_i individual random effects.

Based on recent econometric work on growth, we use as core variables those that are considered important and more or less robust determinants of economic growth, namely initial secondary education and initial production/income.¹⁰ We do not include data on capital stocks or changes in them for the reasons outlined in the introduction. Furthermore, we do not include investment data for a number of reasons: first, according to standard economic theory, the relevant variable influencing growth should be changes in the capital stock, and not investment. That said, one might argue that investment, or rather the share of investment in the economy, could be used as a proxy for capital accumulation. In a situation like Russia's during the 1990s, however, where the dominant factor was obviously a large drop in the use of the existing capital stock, taking investment as a proxy for changes in the capital stock is clearly inappropriate. Second, empirically, according to Easterly (1999), in the short term investment does not cause growth. Third, we believe Russian data on regional private investment to be of particularly poor quality. Finally, in spite of all the arguments against their use, we tentatively tried investment data in some regressions, and—unsurprisingly—found them generally to be insignificant.

We equally include a dummy for Moscow in the core variables to account for the huge difference between the capital and the rest of the country. While this may seem bizarre, anybody familiar with Russia will find it uncontroversial to state not only that Moscow is very different from the rest of the country but also that during the 1990s economic developments in Moscow and the rest of the country took place at completely different tempos.

In each regression we use the 'core' variables on the right-hand side, and supplement them with either one variable at a time or a group of related variables from the 'other variables'. This approach—given the relatively short time span of our sample—has the advantage of allowing us to study the questions we are interested in,

while staying as close as possible to economic theory, and at the same time minimising the problem of multi-collinearity between right-hand side variables.

In order not to rely on a single measure of growth, we run each regression three times with a completely identical right-hand side set of variables, using each of our three measures of growth on the left-hand side. To check for the robustness of results, we re-run each of these regressions, restricting the sample to the regions in the European part of Russia (excluding Asian and Caucasian regions). As these 'European' regions are considered to be relatively homogeneous, we thus try to eliminate the possibility that results are driven mainly by some outlying region. In total we check each identical set of right-hand variables in six different regressions.

For those regressions where there is basically no time variation in the right-hand side variables (as for example when regressing on initial conditions), we take time averages and run simple OLS regressions. For those regressions with right-hand side time variation, we run random-effect panel regressions where we include time fixed effects to account for varying overall Russian growth performance between years.

Hausman tests for all panel regressions confirm that in almost all cases random effects are a correct specification. In the very few cases where a Hausman test rejects random effects, it usually does so only in one of the six regressions for which we use the same right-hand side variables. This indicates that those rejections are not genuinely economically interesting, and we do not specifically report the cases in which random effects are rejected. We do, however, run simple OLS regressions of time averages in those few cases where random effects are rejected as the correct econometric specification, and report those results instead.

In a second step we run two-stage least square (instrumental variables) regressions for variables that come out significant in our regressions but suffer from potential endogeneity problems. For example, net transfers per capita to a region come out strongly significant with a negative sign in the simple one-stage growth regressions. This could lead to the conclusion that these transfers have a negative impact on growth performance. The story behind that could be that these transfers foster corruption and are disincentives for local political elites to improve an appalling business climate. There may, however, be an endogeneity problem with the one-stage regression. A region's worsening economic situation may simply lead to increased transfers from the centre, and our regressions could be picking up this effect. We thus use two-stage OLS regressions, where we instrument net transfers by an index for the potential of ethnically based separatism, the degree of longitude where a region's capital is situated, and a proxy for a region's initial share of agricultural production. However, once we use these instruments the significance of net transfers in our growth regressions disappears almost completely. Given that our instrument variables explain the net transfers variable well, we have to conclude that the one-stage regressions are erroneous owing to endogeneity, and that we do not find any significant evidence that net transfers have an impact on a region's growth performance.

Other variables that come out significant in the one-stage regressions but suffer from potential endogeneity are election results, data on the revenue and expenditure side of regional budgets, and data on foreign direct investment. We describe potential endogeneity problems in detail when we deal with the relevant variables. Moreover, for each variable where we use two-stage regressions, we report the variables used as instruments, as well as the results of both the one and two-stage growth regressions in the result tables.¹¹ The instruments used always explain the variable with the potential endogeneity problem well, with one exception (FDI), on which we comment specifically in the relevant section.

The ‘Core Variables’

Before setting up our hypotheses in the following sections, we discuss the results for the variables that we use as the ‘core’ in all our regressions. These are initial secondary education, initial production (or income) and a dummy variable for Moscow (see Table 1).

Human Capital

This decade’s developments in endogenous growth theory and the related econometric work have highlighted the importance of human capital for economic development (for a somewhat relativising discussion see Benhabib & Spiegel, 1994). During the process of transition, enterprises and economic agents were (and are) forced to change their economic behaviour substantially, and to acquire a large amount of new skills. It seems reasonable to expect agents with a higher level of education to find these changes easier to accomplish, and so regions with a higher human capital level do relatively better during transition. However, for the variable that usually delivers the best results in cross-country regressions, secondary education, there is less variation within Russia than in cross-country studies, owing to the high standard of the Soviet education system. It was therefore somewhat surprising to find that the share of the population with secondary education was not only much more significant than any other human capital variable we investigated, but one of the most significant and robust variables in explaining differing regional performance, especially when looking at GRP growth.

Initial Production/Income

We include initial levels of production and income¹² mainly to conform to comparable econometric studies. It is important to note that in our regressions the effect of initial production/income differs depending on the measure of performance adopted. While there is a largely significant negative effect of initial real income on real income growth, the effect of initial industrial production on industrial growth is positive. Initial GRP, in the end, has no effect on GRP growth. Following the convergence view this would mean that income in Russia has been converging, while industrial production has been diverging. This paradox might be the reflection of traditionally higher wages in the Far East regions during Soviet times, and a substantial reduction of this Far East premium during the process of transition.¹³

Moscow

Moscow city’s outperformance in income and GRP growth comes as no surprise. The fact that it has, at best, an average industrial performance is equally not unexpected, as the largest part of growth in Moscow has obviously taken place in the service sector.

Politico-institutional Features

In this section we test two hypotheses on how a region’s politico-institutional features may have had an impact on its economic growth performance. We first motivate our hypotheses and explain our choice of variables to test them. We then present the econometric results.

Table 1. Regression on core variables

Measure of output growth	Russia			European part of Russia		
	GRP	Real income	Industrial production	GRP	Real income	Industrial production
Initial production/income	−0.008 [0.45]	−3.99*** [1.19]	1.49*** [0.45]	−0.25 [0.66]	−2.58 [2.40]	0.46 [0.59]
Initial secondary education	0.45*** [0.13]	0.28** [0.12]	0.16* [0.091]	0.34** [0.15]	0.15 [0.13]	0.025 [0.12]
Moscow dummy	14** [5.38]	16*** [3.86]	−4.93 [4.33]	16*** [5.00]	15*** [4.22]	−2.49 [4.27]
R-square	0.32	0.29	0.20	0.41	0.34	0.02
Number of regions	77	72	77	50	49	50

Note: This table reports the results of standard OLS regressions of different measures of economic growth (economic growth rates are simple time averages for each variable) on the core variables that are specified in the column to the left. Each column reports the results for one regression (coefficients and standard deviations), where the variable on top of the regression specifies the measurement of output growth used as left-hand side variable. As indicated, three of the columns report results obtained using the complete sample, and three columns report results for a sample restricted to the European part of Russia. Asterisks indicate conventional significance levels (* = 10%, ** = 5% and *** = 1%).

H1: Regions with less reform-oriented political elites or less reform-oriented population will experience less economic growth.

One recurring theme of the early transition literature (see for example World Bank, 1996) has been that faster and more profound economic reform should be rewarded by higher economic growth. Assuming that the political attitude of the regional political leadership has an impact on the speed and intensity with which regional reforms are implemented, or more generally on the quality of economic policy in a region, one would expect regions with a more pro-reform leadership to attain higher economic growth. We first look at the party membership of regional governors. As not even half of the governors in our sample are actually official members of a political party, we equally consider by which party a governor was supported during his election campaign as a proxy for his political orientation. Governors close to the Communist and Liberal Democratic¹⁴ parties are generally considered to be more hostile to economic reform, hence conventional wisdom would expect their regions to substantially underperform. Nevertheless, economic policy might not depend only on a governor, but equally on a region's legislative body. We therefore also investigate whether the dominant political attitude of a region's parliament has an impact on economic growth performance. We proxy this general attitude of the legislative body by the political affiliation of its head. Finally, the political preferences of a region's population might have an impact on the political feasibility of reform. If this is the case, regions that have an 'anti-reform' voting record, for example by voting 'more Communist' in the past, should underperform. However, there is obviously an endogeneity problem, as it might be that in regions with bad growth performance voters show their protest by voting against reform.

H2: Regions with less efficient institutions will experience lower economic growth.

Currently, one of the main lessons the economic profession has drawn from the experience of transition is that institutions matter for economic development (see for example World Bank, 2002). We thus want to test to what degree regional economic performance has been influenced by the quality of regional institutions. Finding good indicators for institutional quality in Russian regions is, however, difficult. After careful consideration we choose tax collection per capita and expenditure provision, i.e. the ratio of tax collection to budget expenditure.

The first is supposed to capture the actual institutional capacity of a region to tax its citizens. If a region is incapable of efficiently organising this most basic function, there seems to be little hope that other (very probably underfunded) institutions will be of a high quality. The second proxy, expenditure provision, is a way of measuring budgetary responsibility in a region. It has been shown that badly designed institutional features increase the tendency for permanent high deficits in national budgets (von Hagen, 1992; Alesina *et al.*, 1999). Hence, if a region is fiscally responsible, this could be an indication that its institutions are not that bad after all. Both proxies obviously need instrumenting as they face the problem of endogeneity. Poorly performing regions with a large share of loss-making enterprises might simply be unable to collect sufficient taxes, and thus run large deficits.

Results for H1 and H2

In the following we discuss the empirical evidence concerning the hypotheses formulated. We do not find any evidence for our hypothesis (H1) that the attitude of

regional elites to reform affected economic growth (see Table 2). We find no effect of governors' party membership, but this might partly be due to the fact that there are only a limited number of politically affiliated governors. It is more interesting to see that even the political orientation of a governor, as shown by which parties supported him during his election campaign, did not have a significant impact. Nor did the political orientation of a region's legislative body.¹⁵

We equally find no evidence that the general attitude of a region's population towards reform made any difference to economic growth. Neither a proxy for the degree of pro-reform votes in the 1996 presidential election nor a dummy for the regions where the communist candidate Zyuganov won a majority in the run-off against El'tsin come out significant. Only a proxy for the degree of pro-reform votes in the 1995 Duma election (the 'Duma election score') comes out significantly positive in one of the one-stage regressions. As there is a potential endogeneity problem (poor economic performance leading to more anti-reform voting) this finding has to be controlled in a two-stage least square ('instrumental variables') regression procedure. So, in the first stage, we instrument the Duma election score by Potential for Ethnically Based Separatism, Longitude, Initial Share of Agriculture and the core variables. Neither of the instrumental variables (apart from the core variables) significantly explains any of the growth variables. However, they explain the Duma election score very well. In the second stage, when we use the instrumented Duma election score in the growth regressions, any significance of the election variable disappears. Hence we conclude that the earlier significant result was mainly driven by endogeneity, and we do not find any evidence that the attitude of the population, as proxied by election results, had any impact on a region's economic growth performance.

Evidence that regional growth has been driven mainly by differences in institutional efficiency (H2) is scarce as well (see Table 3). We find that tax collection and expenditure provision come out significantly positive in the one-stage regressions. But as there are major potential endogeneity problems, we have to use two-stage regressions again to confirm these results.¹⁶ Significance basically vanishes when instrumenting, with the rare exception of some regressions on real income growth in the European part of Russia. As our instruments explain the relevant institutional variables well, this is an indication that the correlation between our proxies for institutional efficiency and regional growth performance mainly reflects regional government difficulties collecting taxes and keeping expenditure up in circumstances of economic decline.¹⁷

In short, we do not find any evidence that during the 1990s regional differences along political and party lines had any impact on regional growth performance. Moreover, we find no persuasive evidence that our proxies for institutional efficiency had an influence on economic performance.

Other Variables

In addition to the results presented above, we also tested for a number of other variables, which did not produce any significant results. For reasons of space, we mention these variables only briefly here (a more detailed discussion can be found in Ahrend, 2002). We looked at whether the fact that governors were appointed or elected made a difference to regional growth,¹⁸ and found that it did not. We also looked at several variables in order to see whether inadequate fiscal incentives for regions lead to lower economic growth. While we found some simple correlations, the results disappeared when we instrumented to control for potential endogeneity. In this

Table 2. Politico-institutional variables: H1

Measure of output growth	Russia			European part of Russia		
	GRP	Real income	Industrial production	GRP	Real income	Industrial production
Governor member of KPRF	0.23 [2.58]	-0.66 [1.66]	-0.24 [1.66]	0.084 [2.71]	-0.086 [1.88]	0.36 [1.69]
Governor member of NDR	0.63 [1.53]	0.88 [1.02]	0.14 [0.97]	0.56 [1.79]	1.56 [1.23]	1.30 [1.07]
Governor member of LDPR	-3.47 [6.32]	-0.28 [5.15]	-3.67 [4.07]	-1.15 [7.10]	-0.34 [5.05]	1.03 [4.67]
Governor Supported by KPRF	-0.073 [2.86]	1.38 [1.82]	0.30 [2.26]	-1.80 [3.18]	-1.02 [2.14]	1.10 [1.50]
Governor supported by centrist parties	2.15 [3.40]	2.76 [2.48]	-1.98 [2.70]	-1.85 [4.32]	-1.62 [3.04]	-1.71 [1.98]
Governor supported by El'tsin Camp	0.36 [2.33]	1.45 [1.43]	-0.074 [1.85]	-0.65 [2.61]	-0.27 [1.69]	0.68 [1.04]
Governor supported by LDPR	-0.42 [8.00]	0.95 [5.33]	-3.27 [6.41]	-2.58 [7.53]	-1.65 [5.34]	2.72 [5.35]
Presidential election score	0.70 [1.53]	1.26 [1.09]	1.08 [1.21]	1.53 [1.65]	1.60 [1.18]	1.19 [1.32]
Voted Communist in 1996 (dummy)	-0.75 [1.28]	-0.83 [0.94]	0.74 [1.05]	-1.66 [1.36]	-0.98 [0.98]	-0.83 [1.19]
Duma election score(> with reform vote)	1.51 [1.87]	1.47 [1.37]	0.41 [1.54]	4.65** [2.15]	2.42 [1.53]	2.39 [1.86]
(instrumented)	7.57 [5.19]	4.22 [4.24]	5.08 [5.55]	14 [10]	5.45 [3.88]	13 [10]

Notes: 1. Each row reports the coefficients and standard deviations from regressions of the specified politico-institutional variable on different measures of economic growth as indicated at the top of the corresponding column. The variables included on the right-hand side of a regression—in addition to the core variables from Table 1—are those between two horizontal lines. For panel regressions, in addition, time dummies are included. The coefficients of core variables and time dummies are not reported due to space restrictions and to keep tables readable, but can be obtained from the author upon request. As indicated, three of the columns report results obtained using the complete sample, and three columns report results for a sample restricted to the European part of Russia. (* = 10%, ** = 5% and *** = 1% significance levels).

2. The row for the variable Duma election score reports results for simple one-stage growth regressions. The row directly below reports results for the two-stage growth regressions. The instruments used for these two stage regressions, in addition to the core variables, are Potential for Ethnically Based Separatism, Longitude and Share of Agriculture.

Table 3. Politico-institutional variables: H2

Measure of output growth	Russia			European part of Russia		
	GRP	Real income	Industrial production	GRP	Real income	Industrial production
Tax collection per capita	14***	4.43**	7.64***	22***	3.87	9.50***
(instrumented)	[3.85]	[1.91]	[1.71]	[5.61]	[2.42]	[2.19]
	15	5.14	-0.50	5.74	16***	6.08
	[12]	[5.26]	[6.03]	[13]	[4.89]	[6.69]
Expenditure provision	5.96***	2.08	3.18**	5.31*	2.28	2.95
(= Exp./Taxes) (instrumented)	[2.00]	[1.31]	[1.50]	[2.91]	[1.89]	[1.97]
	3.85	2.20	-3.37	1.75	7.46***	2.07
	[2.41]	[1.69]	[3.25]	[4.18]	[2.78]	[5.20]

Note: See Table 2, Note 1. The rows for the variables Tax Collection and Expenditure Provision report results for simple one-stage growth regressions. The row directly below each of the two variables reports results for the two-stage growth regressions. The instruments used for these two-stage regressions, in addition to the core variables, are Potential for Ethnically Based Separatism and Longitude.

context we also looked at whether republics recorded consistently different growth performance, but also found no significant differences. We also used several proxies for violent conflict potential, as well as a proxy for corruption, to examine whether these factors negatively affected regional growth, but also found no significant impact.

Measures of Economic Reform

In this section we test four hypotheses concerning how regional economic reform has had an impact on regional economic growth performance. As argued earlier, according to economic consensus in the 1990s (e.g. World Bank, 1996), regions that undertook more far-reaching economic reform should have been rewarded by a better growth performance.

H3: Regions with a higher share of regulated prices will experience lower growth.

We use two variables, one that reflects the degree of food price regulation, and another that reflects the degree of price regulation in goods and services. A higher degree of food price regulation should be a disincentive for agricultural production, and a higher proportion of regulated prices of goods and services should lead to distortions in the allocation of resources to production. Thus both types of price regulation should be detrimental to a region's growth performance.

H4: Regions with a higher share of privatised and/or private economic activity will experience higher growth.

Under most circumstances privately owned enterprises will be more efficient than those owned by the state (see e.g. Megginson & Netter, 2000). It has generally been argued (e.g. Berkovitz & DeJong, 2003) that regions that privatised more actively should have become more economically efficient, and hence enjoyed a superior economic growth performance to those dragging their feet on this issue. Or, from a somewhat more general perspective, regions that profit from a larger share of private economic activity should experience faster economic growth. We use three variables to proxy for the share of the private sector in a region. First, we look at the share of small enterprises (in trade, catering and household services) that are privately owned. This variable has been used as a proxy for small-scale privatisation (Berkovitz & DeJong, 2003). It should in any case be a proxy for the degree of private ownership within a region, and thus have a positive impact on a region's economic performance. Second, we look at the number of small enterprises (per capita).¹⁹ Small companies have been the driving force behind growth in other transition countries (e.g. for Poland see Konings *et al.*, 1996), so one would expect regions with a larger number of small enterprises per capita to show a better growth performance. Third, as new enterprises are generally privately owned, the growth in the total number of enterprises should equally be a proxy for the degree of private activity within a region. One must, however, be aware that there may be an endogeneity problem, i.e. that it is economic growth that leads to new enterprise start-ups, and hence to an increasing number of enterprises.

H5: Regions that spend a larger part of their expenditure on subsidies will experience lower growth.

Subsidies for production or agriculture indicate state activities in areas where, according to economic theory, there is generally very little rationale for such

intervention. Thus we would expect regions with a high level of such intervention to underperform in the longer run.²⁰

H6: Regions with higher FDI inflows will experience higher growth.

Foreign direct investment (FDI) is generally regarded as an important factor in economic development (see e.g. Bergsman *et al.*, 2000), and is growth enhancing (Borenstein *et al.*, 1995). We would thus expect FDI inflows into a region to have a beneficial impact on growth performance.

Results for H3–H6

Surprisingly, we found almost no econometric support for any of our hypotheses in this section. We find no evidence that a region's greater reliance on price regulation (H3) had the expected negative effect on economic growth. Neither do we find convincing evidence that regions with a higher share of privatised or private enterprises showed better growth performance during the 1990s (H4) (see Table 4). Both the number of small enterprises per capita and the growth in the number of enterprises come out insignificant.²¹ The exception is the proxy for small-scale privatisation, which comes out significantly positive and quite robust, albeit only for real income growth. It stays largely insignificant with varying signs for industrial production and GRP growth. The latter is particularly worrying, as we consider GRP growth to be by far the best measure of a region's economic performance. Given the other econometric results, we are led to conclude that the correlation between the proxy for small-scale privatisation and income growth is unlikely to represent an economic reality, but rather reflects a peculiarity in the way the data are calculated.²²

Likewise, greater reliance on subsidies (H5) did not have the expected negative effect on regional growth (see Table 5). Industrial subsidies come out significantly positive in the real income regressions, and agricultural subsidies in the industrial growth regressions. This may, however, reflect an endogeneity problem. Subsidies may have been higher in regions which experienced superior economic growth because they could more easily afford them. When we instrument the subsidy variables, any impact of subsidies on growth vanishes.²³ Hence we do not find any robust evidence that subsidies influenced regional growth performance.

Though this is not the focus of this article, it seems interesting to note that agricultural subsidies and food price regulation are—contrary to conventional wisdom—not a pet policy of governors close to the Communist Party. Correlation coefficients show that they have been used at least as extensively by governors who were supported by President El'tsin's official 'Reform' camp as by Communist-backed governors.

Even econometric proof of a positive impact of foreign direct investment (H6) is scarce. FDI comes out significantly positive only in the reported OLS regression of time averages on GRP growth restricted to the European part of Russia.²⁴ To put it another way, FDI had neither any significantly positive effect on the other output measures nor in the panel regressions, nor in the OLS regression on GRP growth for the whole sample. In addition, there is obviously a substantial endogeneity problem, as a correlation between FDI and growth could simply arise as foreign investors are attracted to faster-growing regions.²⁵ We hypothesise that the absence of a robust and strong positive effect of FDI on regional growth is probably due to the extremely low level of such investment. In spite of the fact that FDI had a strong positive effect on enterprises' productivity (Yudaeva *et al.*, 2003), the amount of FDI that Russia

Table 4. Measures of economic reform: H3–H4

Measure of output growth	Russia			European part of Russia		
	GRP	Real income	Industrial production	GRP	Real income	Industrial production
Food price regulation	–0.001 [0.032]	0.008 [0.023]	0.019 [0.026]	–0.023 [0.037]	–0.020 [0.026]	0.017 [0.032]
Price regulation, goods and services	0.086 [0.066]	0.029 [0.049]	0.021 [0.054]	0.077 [0.064]	–0.007 [0.048]	–0.010 [0.056]
Small-scale privatisation	0.17 [0.12]	0.15* [0.086]	–0.090 [0.096]	0.17 [0.14]	0.26** [0.10]	–0.058 [0.13]
Number of small businesses p. c.	0.16 [2.49]	–0.76 [1.36]	–3.81** [1.55]	–1.56 [3.02]	–1.40 [1.64]	–1.40 [1.88]
Growth in number of enterprises	0.10 [3.10]	–3.68* [2.10]	–0.41 [0.87]	1.60 [2.91]	–2.45 [2.15]	–0.56 [1.01]

Note: See Table 2, Note 1.

Table 5. Measures of economic reform: H5–H6

Measure of output growth	Russia			European Part of Russia		
	GRP	Real income	Industrial production	GRP	Real income	Industrial production
Industrial subsidies (% of expenditure)	– 22	44***	– 28*	– 39	94***	– 12
(instrumented)	[40]	[15]	[16]	[62]	[17]	[18]
	– 79	– 76	46	– 53	– 7.92	101
	[60]	[52]	[62]	[182]	[142]	[275]
Agricultural subsidies (% of expenditure)	25	22	50***	15	– 2.85	41**
(instrumented)	[23]	[15]	[17]	[25]	[17]	[18]
	8.13	41	– 54	– 40	– 1.62	– 13
	[41]	[35]	[42]	[40]	[36]	[43]
Foreign direct investment (p.c.)	0.050	– 0.023	– 0.011	0.25***	0.045	– 0.011
	[0.033]	[0.022]	[0.025]	[0.072]	[0.049]	[0.061]

Note: See Table 2, Note 1. The rows for the variables Industrial Subsidies and Agricultural Subsidies report results for simple one-stage growth regressions. The row directly below each of these variables reports results for the two-stage growth regressions. The instruments used for these two-stage regressions, in addition to the core variables, are in the first case Potential for Ethnically Based Separatism, Longitude, and Initial Share of Industry. In the second case, in addition to the core variables, we use Potential for Ethnically Based Separatism, Longitude, Food Price Regulation and Initial Share of Agriculture.

received during the 1990s probably was simply not substantial enough to make a significant contribution to economic activity on more than the local level.

Summarising briefly, our econometric analysis seems to indicate that the degree to which a region implemented economic reform had little impact on its growth performance. The exception might to some degree be small-scale privatisation, but the lack of impact of this variable on GRP growth, which we consider the best measure of economic performance, sheds serious doubt on this finding. FDI might have played a minor positive role, but the results are not very significant and are extremely unstable. These findings obviously do not mean that regional reforms are not important, did not work, or will not make a major difference in the future. They do, however, show that for the transition period of declining output (1990–98) the implementation of regional reform had little impact on growth performance.

Initial Conditions

In this section we test to what degree regional growth performance was determined by initial conditions. We consider a total of four hypotheses, two of them dealing with initial economic conditions, two with more general initial features.

H7: Regions with a larger natural resource endowment experienced higher economic growth.

Natural resource endowments are often considered a mixed blessing. While natural resources are valuable export items, they can easily lead to ‘Dutch disease’ problems, and hence can have an overall negative impact on an economy (Sachs & Warner, 2001, 1997). However with regard to Russian regions, natural resource endowments should have played a positive role. In a situation where both Russian demand and industrial production were collapsing, the production of commodities that could easily be diverted for export should have been an advantage. Second, world market prices for most commodities are much higher than internal prices in Soviet times. Hence, resource-rich regions should have experienced a positive ‘terms of trade’ shock allowing them to cushion themselves at least partially from the general collapse in GRP.

H8: Regions with a larger share of more competitive industries at the start of transition experienced higher economic growth.

As growth has varied widely between different industrial sectors, we include initial industrial structure variables to control for the degree to which a region’s performance was influenced by nation-wide developments in its main industries. More precisely, we use variables that indicate the initial share of various key industries in total industrial production in a region. Given that during Soviet times different industries worked at different levels of competitiveness compared with international standards (Senik-Leygonie & Hughes, 1992), this indirectly tests to what extent a region’s economic performance was driven by the initial competitiveness of its industrial sector.

Furthermore, we consider a region’s initial share of exports abroad (as % of GRP). If a region was, already in the early stages of transition, able to export a larger share of its industrial production abroad, this indicates that a larger part of its production was at least not too far away from international competitiveness. Hence a higher export share roughly equates with a region having ‘better’ enterprises, and we can expect such a region to show signs of superior growth performance.

H9: Regions with an advantageous geographical position experienced higher economic growth.

H9-a: Regions with easy access to major routes for international transport experienced higher growth.

H9-b: Regions that are geographically closer to Western Europe, and especially St Peterburg, experienced higher growth.

H9-c: Regions in the 'red belt' experienced lower growth.

Initial geographical conditions are mainly supposed to catch effects from location in more or less favourable areas. It is generally expected that countries with easy access to major routes for international transport perform better (Sachs & Warner, 1997). We therefore expect regions with major ports to outperform. We equally consider 'pure' geographical location, that is the longitude of a region's capital. This variable is very close to the 'distance from some Western European Capital' variable that has been popular in regressions on growth performance of transition economies (e.g. EBRD, 1999). We also investigate whether the regions in the European part of Russia performed better, and test whether St Petersburg, 'Russia's window to the west', profited from its advantageous geographical location. Finally, we test whether being a region located in what political scientists call the 'red belt' led to a particularly poor growth performance. The 'red belt' is a part of south-western Russia, often ruled by Communist governors, which Western economists generally consider to have been dragging behind on reform, and to have experienced a particularly uninspired growth performance since the start of transition (see for example Berkovitz & De Jong, 1999).

H10: More urban regions experienced stronger growth.

Though economic theory tells little about the relationship between population structure and growth, casual empirical evidence from various countries seems to suggest that large cities generally have been growing faster during recent years than rural areas, and we would expect the same effect to hold for Russia. We look at the share of a region's population that lives, respectively, in big cities, medium cities, small cities, small towns and rural areas. Moreover, we use an urbanisation index and population density as further proxies for how urban a region is.

Results for H7–H10

As expected, a more favourable natural resource endowment (H7), and especially production of oil and gas, significantly explain better economic performance (see Table 6).²⁶ It is somewhat surprising to see that coal mining regions did not underperform the general average, taking into account all the negative media coverage of these places.

The initial share of exports in GRP (H8), on the contrary, not only comes out highly significant with the expected positive sign but actually turns out to be one of our most robust variables in explaining regional growth differences (see Table 7). It stays highly significant in almost all specifications, and especially when controlling for natural resource endowments. We thus deduce that the initial competitiveness of a region's industry was one of the most important factors behind a region's economic performance. This finding is corroborated by the results concerning industrial structure. We see that regions with larger shares in fuel, metal or chemical production did significantly better, whereas regions with a large share in building materials, light

Table 6. Initial conditions: H7

Measure of output growth	Russia			European Part of Russia		
	GRP	Real income	Industrial production	GRP	Real income	Industrial production
Oil production	0.22** [0.093]	0.11* [0.058]	0.038 [0.067]	0.59 [0.38]	0.23 [0.28]	0.84*** [0.31]
Gas production	0.066* [0.035]	0.042* [0.021]	0.002 [0.025]	- 0.11 [0.28]	- 0.064 [0.21]	0.29 [0.24]
Coal production	- 0.11 [0.13]	0.031 [0.092]	0.17* [0.096]	- 0.26 [0.24]	0.28 [0.19]	0.15 [0.20]
Natural resource endowment index	0.84 [1.34]	1.62* [0.85]	2.57*** [1.18]	0.11 [1.52]	1.34 [1.05]	2.93** [1.18]

Note: See Table 2, Note 1.

industry and food processing did particularly badly. Interestingly these latter industries are among those whose revival was strongest after the August 1998 devaluation, giving further evidence that they were, to a large degree, non-competitive before. The results concerning industrial structure are robust when controlling for export shares with the exception of the ferrous metal industry. We would thus argue that they capture another aspect of competitiveness (e.g. one might think of the capacity to compete with imports) that is not fully revealed in initial export shares. In short, a large part of differing regional performance in Russia can simply be explained by the 'initial quality', that is the initial competitiveness, of its industrial enterprises. Some regions were simply more fortunate, insofar as their heritage from Soviet times included larger shares of 'better' industries. To an important degree regional growth performance was independent of any actions taken within a region but was driven by history.

With respect to geographical location (H9), we find it to have some impact (see Table 8). Regions with a port (H9-a) did—at least in GRP growth—significantly better. However, the degree of longitude on which a region is situated—a proxy for closeness to the West—is largely insignificant, as is being a region in the European part (H9-b) or in the infamous 'red belt' (H9-c). Surprisingly,²⁷ St Petersburg did not have above-average growth performance, in spite of being a port, a large city and located in a rather well-performing part of Russia.

Population structure (H10) seems to have played a role in the expected sense, at least for real income and GRP performance. Regions with a larger share of the population living in bigger cities did significantly better, whereas regions with a larger population share in rural areas and especially small towns fared worse.²⁸ This general bias towards more urbanised regions is confirmed by an index of a region's degree of urbanisation, which equally comes out largely significant in our regressions, and by the fact that more densely populated areas did better in GRP growth. However, densely populated areas did underperform in industrial production.

Other Variables

In addition we also tested a number of other initial conditions, which yielded no significant findings. We looked, for example, at whether the initial structure of output had a significant impact on growth, but found little evidence for this. A larger share of agriculture had a somewhat negative effect, but this was statistically significant only for GRP growth. The share of industrial production generally came out with a positive coefficient, but was not usually statistically significant. Contrary to our expectations, regions with a higher initial share of services did not perform better than average, at least not when controlling for a region's initial wealth and human capital. A possible explanation for this might be that a large initial Soviet services sector could have been an obstacle to the creation of a new, more productive private services sector.

We also checked whether neighbours mattered for border regions, the idea being that a frontier with a rich or well-performing neighbour state should benefit a region. We found that foreign neighbours had little significance, and where they had some effect it often took unexpected forms. Regions neighbouring (fast-growing) China fared particularly badly in industrial production, whereas, perhaps surprisingly, regions sharing borders with Ukraine and Belarus apparently did somewhat better in real income growth. Proximity to Baltic or EU countries had no effect at all.²⁹ This may reflect the fact that both China and Western Europe have mainly been importing raw materials from Russia, and these are rarely produced close to the respective

Table 7. Initial conditions: H8

Measure of output growth	Russia			European Part of Russia		
	GRP	Real income	Industrial production	GRP	Real income	Industrial production
Share of power sector	– 0.048 [0.11]	– 0.049 [0.093]	0.16* [0.087]	– 0.044 [0.12]	0.005 [0.095]	0.086 [0.12]
Share of fuel sector	0.13** [0.052]	0.061* [0.032]	0.092*** [0.034]	0.066 [0.061]	0.11*** [0.033]	0.047 [0.046]
Share of ferrous metals sector	0.093* [0.051]	0.061* [0.037]	0.12*** [0.040]	0.083 [0.053]	0.11*** [0.037]	0.15*** [0.054]
Share of non-ferrous metals	0.019 [0.054]	0.074* [0.038]	0.088** [0.038]	0.032 [0.12]	0.069* [0.039]	0.043 [0.051]
Share of machinery sector	0.071 [0.051]	0.025 [0.042]	0.020 [0.042]	0.068 [0.057]	0.047 [0.043]	0.027 [0.056]
Share of chemical sector	0.19** [0.081]	0.14** [0.065]	0.13** [0.064]	0.25*** [0.089]	0.11* [0.066]	0.17* [0.085]
Share of wood sector	– 0.057 [0.073]	– 0.064 [0.055]	0.010 [0.050]	– 0.076 [0.072]	– 0.16*** [0.055]	0.009 [0.069]
Share of building materials	– 0.82*** [0.22]	– 0.31 [0.26]	– 0.58*** [0.16]	– 0.67 [0.43]	– 0.66** [0.26]	– 0.63*** [0.22]
Share of glass sector	– 0.47 [0.73]	0.45 [0.54]	0.21 [0.50]	– 0.32 [0.70]	– 0.24 [0.55]	0.31 [0.68]
Share of light industry	– 0.071 [0.082]	– 0.089 [0.063]	– 0.21*** [0.055]	– 0.10 [0.088]	– 0.084 [0.064]	– 0.32*** [0.074]
Share of food industry	– 0.082* [0.047]	– 0.065* [0.038]	– 0.044 [0.032]	– 0.14* [0.078]	– 0.074* [0.038]	0.012 [0.043]
Share of milling industry	– 0.074 [0.41]	– 0.22 [0.34]	– 0.73*** [0.27]	0.46 [1.01]	0.23 [0.35]	0.19 [0.36]
Share of exports (% of regional GRP)	17** [8.19]	12** [5.60]	24*** [6.26]	15 [9.38]	14*** [5.31]	27*** [5.61]

Note: See Table 2, Note 1.

Table 8. Initial conditions: H9-H10

Measure of output growth	Russia			European Part of Russia		
	GRP	Real income	Industrial production	GRP	Real income	Industrial production
Dummy for major port	3.15** [1.45]	-0.36 [1.13]	0.19 [1.17]	4.08** [1.57]	1.05 [1.25]	2.95** [1.41]
Dummy for European part	1.09 [1.26]	1.17 [0.99]	1.63 [1.06]			
Dummy for St Petersburg	0.84 [5.70]	4.04 [4.18]	-6.34 [4.37]	3.90 [5.45]	6.94* [3.88]	-4.85 [4.66]
Longitude of region's capital	-0.037* [0.020]	-0.027 [0.017]	-0.004 [0.014]	0.036 [0.090]	0.005 [0.060]	0.086 [0.069]
Dummy for 'red belt'	-0.33 [1.38]	-0.11 [0.99]	0.77 [1.07]	-1.24 [1.37]	-0.74 [0.94]	-0.25 [1.21]
Urbanisation index	2.86** [1.13]	1.56* [0.90]	0.21 [1.10]	2.05 [1.43]	2.45** [0.99]	0.53 [1.42]
Population density	0.053** [0.025]	0.006 [0.020]	-0.039** [0.018]	0.047* [0.026]	-0.003 [0.023]	-0.041* [0.022]

Note: See Table 2, Note 1.

borders, so this trade does not necessarily benefit the border regions in any significant way. Moreover, the easy availability of cheap manufactured goods in China may have had a stronger negative effect on industrial output in places closer to China. In contrast, trade with CIS countries has generally been more diversified, and therefore regions bordering other CIS countries may have been better able either to sell part of their production to the near abroad or more generally to profit from the passing trade flows.

The development and growth literature has long argued that good infrastructure is a prerequisite for high growth (see Easterly & Levine, 1997). We therefore checked whether regions with better infrastructure experienced better growth performance. We used several proxies for infrastructure, such as railway and highway density, but found that they had no significant impact. As these proxies are highly correlated among themselves and equally so with population density, this should perhaps be interpreted as some kind of posthumous praise of Soviet planners, in the sense that they at least achieved an equally adequate (or inadequate) level of infrastructure for all parts of Russia.

Robustness of Results

Apart from the results reported above, we have run a large number of additional regressions to check for robustness. These results are not reported owing to space restrictions and to keep result tables readable, but can be obtained from the author upon request. First, we re-ran the regressions on industrial output and real income growth for the 1995–97 period, to make sure that results that differ from those obtained with GRP growth do not simply come from the fact that output variables cover different time spans. Though results sometimes differ slightly for different time periods, the main results as reported are preserved. Second, we ran simple OLS regressions on time averages for all panel regressions, not only the few where this was necessary owing to ‘bad’ Hausman-Tests. Results were robust in the face of this exercise, with the exception of FDI, as mentioned above. Third, we equally re-ran all regressions including initial export share—maybe our most robust variable—as a core regressor. This again did not lead to any significant qualitative changes in the results, apart from those very few reported above. Fourth, we re-ran a large number of regressions controlling for other variables that might be of importance. For example, we ran the industrial and agricultural subsidies regressions controlling for the respective shares of industry or agriculture in a region, we controlled for the average temperature in the regression with housing subsidies, and so on. These inclusions changed results only in the very small number of cases we reported above. Fifth, and finally, we used robustly significant variables from different areas in the same regression to determine the ‘more important and robust’ explanations for differing economic performance. This exercise proved problematic, as, owing to multicollinearity, the results became dependent on the exact list of variables included in a regression. Nevertheless, this exercise showed that factors that are strongly and robustly significant in the regressions reported above are the ones that show up as more or less consistently significant in the enlarged regressions. Variables that previously were less significant, or that were not robust to the different specifications of our left-hand side variables, usually tended to lose significance in a large part of these enlarged regressions. Finally, variables that were insignificant in the original regressions generally stayed insignificant in the enlarged regressions. The robust variables—

apart from our core variables—were the variables on industrial competitiveness and especially initial export share, the variables on natural resource endowments and the variables describing a higher degree of urbanisation.

Conclusion

In this study we have thoroughly investigated the impact of a large number of potential factors on Russian regions' economic performance during the 1990s. We find the initial competitiveness of a region's industry, as measured by the share of exports in regional production, to be the most significant and robust explanation for differing regional performance. We also show industrial structure to matter, and interpret this as further proof indicating that regions with bigger shares in more competitive industries did relatively well, whereas those with larger shares in uncompetitive industries did especially poorly. In addition, we find resource endowment, as well as natural resources and human capital, to have played an important role in explaining differing performance. Urbanisation also had a positive impact on growth performance. Moscow (unsurprisingly) outperformed the average by far, whereas St Petersburg (surprisingly) did not.

Another interesting (and maybe more surprising) part of our results is what did not matter. We found political variables, such as the governor's political orientation, not to have affected regional economic performance. In addition we found that the degree to which a region implemented economic reforms seemed to have played a far less prominent role in explaining its economic performance than we would have expected. The initial situation in which a region found itself at the start of transition seems to explain its relative economic success or failure much better.

Notes

1. This classification is to a certain degree arbitrary, but we find it helpful for expositional clarity.
2. We use this term in a somewhat unconventionally broad sense.
3. Early and influential examples are Barro (1991) and Mankiw, Romer & Weil (1992).
4. See for example World Bank (1996), Popov (1999a) and EBRD (1999) for differing views on this issue.
5. However, this does not prove that regional reforms are not needed, or will not make a difference to regional performance in the future.
6. More precisely, the Federal Service for State Statistics (formerly Goskomstat), in an attempt to account for undeclared income, corrects reported regional income using regional retail trade data. A large share of private small enterprises are actually enterprises active in trade. One would expect retail trade to be correlated with the numerical importance of enterprises that have their main business in trade. Hence it is unsurprising to find a correlation between income data and the share of private small enterprises.
7. With respect to the dependence of the Berkowitz & DeJong finding on the measurement of output used (income vs GRP), he claims that large enterprises relocated their headquarters in more reformist regions, thus shifting part of their tax payments to those regions without effectively moving any production. As a consequence, he claims, more reformist regions experienced an enlargement of their regional tax base (and thus indirectly a rise in income levels), without any corresponding increases in regional production.
8. And maybe also our attempt to motivate the hypothesis studied as far as possible by results from economic theory.

9. More precisely $\Delta y_t = \log(y_t) - \log(y_{t-1})$, with the exception of real income, where data are already reported in growth rates.
10. At least for groups of countries that are similar, or for provinces within one country.
11. We do not report the first stage of the two-stage regressions in order to keep the result tables readable. They can be obtained from the author on request.
12. Proponents of this approach have interpreted it as testing for β -convergence, or in a case like ours where we include other variables that control for the general efficiency of an economy or region, as testing for conditional β -convergence (see e.g. Barro & Sala-I-Martin, 1995). Opponents have criticised the whole approach as flawed (Quah, 1993, 1997). Where both have finally come to agree is that simple β -convergence has clearly not been observed on a global level; however, certain economies that were similar in some aspects, part of a 'club' (e.g. the EU), or regions within a country, have often seen income converge over the last decades.
13. As natural resources are abundant in many Far East regions, even though meteorological conditions there are often extreme, their economic development was always a priority for Soviet planning. Stalin, during his rule of terror simply deported billions of innocent people to camps in these areas where most of them were effectively worked to death. Fortunately, later Soviet planners decided to replace terror with more human incentives, and started to offer highly attractive wages for those who were willing to go and work in the Far East. Amid the general chaos of transition Russia's interest in further developing these Far East regions came to a halt, and so a substantial decrease in the Far East wage premium followed.
14. This is the, somewhat misleading, name of the nationalist party run by Zhirinovsky.
15. Regression results for regional legislations are not reported here but can be found in Ahrend (2002).
16. In addition to the core variables, we use Potential for Ethnically Based Separatism and Longitude as instruments, which generally explain the institutional efficiency variable well.
17. Given the difficulty finding good proxies for institutional efficiency, it cannot, however, be excluded that this lack of evidence may be due to the imperfect nature of the proxies used.
18. Governors were still appointed by the centre (Moscow) in the early years of transition, but started to be chosen in elections during the first half of the 1990s. As the first elections of governors were held at different points in time depending on the region, there is variety between 1991 and 1996 even in the cross-section on how governors acceded to power.
19. As Goskomstat has repeatedly changed the definition of small, we compare the level of small businesses in a region with the national average.
20. Subsidies may, however, artificially boost current production, thus having a short-term positive effect on economic performance.
21. As stated before, there is an endogeneity problem as it may be higher economic growth that leads to more new enterprise start-ups, and hence faster growth in the number of enterprises. However, this endogeneity problem should reinforce a positive correlation between economic growth and growth in the number of enterprises. It is thus even more surprising that we do not find any correlation.
22. In an attempt to account for undeclared income, Goskomstat corrects reported regional income using regional retail trade data. A large share of small private enterprises are actually enterprises active in trade. Moreover, one would expect retail trade to be correlated with the numerical importance of enterprises that have their main business in trade. Hence it is unsurprising to find a correlation between income data and the share of small private enterprises.
23. Instruments used, in addition to the core variables, were Ethnic Conflict Potential, Longitude and Initial Share of Industry. Our instruments explain the subsidy variables well.

24. For FDI we report OLS instead of panel regressions in the result table as the latter come out without any significant results.
25. We tried to instrument foreign investment, but the results were inconclusive.
26. As natural resources are to a large degree located in the non-European part of Russia, the effect of natural resources on regional economic performance unsurprisingly partly vanishes when looking at regions in the European part of Russia alone.
27. Or maybe unsurprisingly for those who actually visited it in 1998 or 1999.
28. For detailed regression results see Ahrend (2002).
29. These results are robust to testing for a region's initial export share.

References

- Ahrend, R., 'Speed of Reform, Initial Conditions, Political Orientation, or What? Explaining Russian Regions' Economic Performance', Delta Working Paper, No. 2002-10, February 2002.
- Alesina, A., Hausmann, R., Hommes, R. & Stein, E., 'Budget Institutions and Fiscal Performance in Latin America', *Journal of Development Economics*, 59, 2, 1999.
- Barro, R., 'Economic Growth in a Cross-section of Countries', *Quarterly Journal of Economics*, 106, 2, 1991, pp. 407-443.
- Barro, R. & Sala-I-Martin, X., *Economic Growth* (Boston, McGraw-Hill, 1995).
- Berkowitz, D. & DeJong, D.N., 'Policy Reform and Growth in Post-Soviet Russia', *European Economic Review*, 47, 2, 2003, pp. 337-352.
- Berkowitz, D. & DeJong, D.N., 'Russia's Internal Border', *Regional Science and Urban Economics*, 29, 5, 1999, pp. 633-649.
- Benhabib, J. & Spiegel, M., 'The Role of Human Capital in Economic Development: Evidence from Aggregate Cross-Country Data', *Journal of Monetary Economics*, 34, 2, 1994, pp. 143-173.
- Bergsman, J., Broadman, H.G. & Drebenstov, V., 'Improving Russia's Policy on Foreign Direct Investment', World Bank WPS 2329, 2000.
- Borenstein, E., De Grigorio, J.D. & Lee, J.W., 'How Does FDI Affect Growth', *Journal of International Economics*, 45, 1, 1995, pp. 115-135.
- Easterly, W., 'The Ghost of Financing Gap—Testing the Growth Model Used in the International Financial Institutions', *Journal of Development*, 60, 2, 1999, pp. 423-438.
- Easterly, W. & Levine, R., 'Africa's Growth Tragedy: Policies and Ethnic Divisions', *Quarterly Journal of Economics*, 112, 1997, pp. 1203-50.
- EBRD, *EBRD Transition Report* (European Bank for Reconstruction and Development, London, 1999).
- Konings, J., Lehmann, H. & Shaffer, M., 'Job Creation and Job Destruction in a Transition Economy: Ownership, Firm Size and Gross Job Flows in Polish Manufacturing 1988-91', *Labour Economics*, 3, 3, 1996, pp. 299-318.
- Mankiw, G., Romer, D. & Weil, D., 'A Contribution to the Empirics of Economic Growth', *Quarterly Journal of Economics*, 107, 2, 1992, pp. 407-437.
- Meggison, W. & Netter, J., 'From State to Market: A Survey of Empirical Studies on Privatisation', *Journal of Economic Literature*, 39, 2, 2000, pp. 321-389.
- Mikheeva, N., 'Differentiation of Social-Economic Situation of Russian Regions and Problems of Regional Policy', EERC, mimeo, 1998.
- Popov, V., 'Shock Therapy versus Gradualism: The End of the Debate (Explaining the Magnitude of the Transformational Recession)', *Comparative Economic Studies*, 42, 1, 1999a, pp. 1-57.
- Popov, V., 'Reform Strategies and Economic Performance of Russia's Regions', *World Development*, 29, 5, 1999b, pp. 865-886.
- Quah, D., 'Empirical Cross-Section Dynamics in Economic Growth', *European Economic Review*, 37, 2-3, 1993, pp. 426-434.

- Quah, D., 'Empirics for Growth and Distribution: Stratification, Polarization, and Convergence Clubs', *Journal of Economic Growth*, 2, 1, 1997, pp. 27–59.
- Sachs, J. & Warner, A., 'Fundamental Sources of Long-Run Growth', *American Economic Review*, 87, 2, 1997, pp. 184–188.
- Senik-Leygonie, C. & Hughes, G., 'The Break Up of the Soviet Union: Industrial Profitability and Trade Among the Former Soviet Republics', *Economic Policy*, October 1992.
- Von Hagen, Juergen, 'Budgeting Institutions and Fiscal Performance in the European Communities', Economic Papers No.96, Commission of the European Communities, October 1992.
- World Bank, *From Plan to Market. World Development Report* (New York, Oxford University Press, 1996).
- World Bank, *Building Institutions for Markets. World Development Report* (New York, Oxford University Press, 2002).
- Yudaeva, K., Kozlov, K., Melentieva, N. & Ponomareva, N., 'Does Foreign Ownership Matter? Russian Experience', *Economics of Transition*, 11, 3, 2003, pp. 383–409.

Appendix

Data Sources:

- Ia *Regiony Rossii 1998*, 2 vols (Moscow, Goskomstat, 1998).
- Ib *Rossiiskii statisticheskii ezhegodnik* (Moscow, Goskomstat, 1994, 1995, 1996, 1998).
- Ic 'Sotsial'no-ekonomicheskoe polozhenie Rossii v 1999 godu, monthly (Moscow, Goskomstat) January and February 1999.
- Id 'Uroven'obrazovaniya v Rossii (from 1994 micro-census) (Moscow, Goskomstat, 1995).
- Ila 'Vybory glav ispolnitel'noi vlasti v regionakh Rossii, 1995–1997gg. Elektoral'naya statistika (Moscow, Ves' Mir 1997).
- Ilb *Vybory v Rossiiskoi Federatsii 1991–98 gg.*, CD-Rom (Moscow, Mercator Group, 1999).
- III *Analysis of Tendencies of Russian Regions' Development in 1992–1995*, (Moscow, TACIS, Contract BIS/95/321/057, March 1996).
- IV *Rossiiskie regiony posle vyborov—1996 g.* (Moscow, Yuridicheskaya literatura, 1997).
- V *Predprinimatel'skii klimat regionov Rossii* (Moscow, Nachala-Press, 1997).
- VI *Politicheskii almanakh Rossii*, 3 vols (Moscow, Carnegie Moscow Center, 1998).

List of Variables Used in the Regressions

Data sources are indicated in brackets [].

Left-Hand Side

- Growth of real income per capita (1994–98)—[Ia]
- Growth of real gross regional product (GRP) per capita (1995–97); calculated from nominal annual GRP data —[Ia]^{A1}
- Growth in real industrial production (1991–1998)—[Ia]

Core Variables

- Initial income per capita (1990)—[Ia]
- Initial GRP per capita (1994)—[Ia]
- Initial industrial production per capita (1990)—[Ia]
- Share of population with completed secondary education, as of 1994—[Id]^{A2}
- Dummy for Moscow city

Politico-institutional Variables

H1

- Dummy for (current) governor membership of communist party (KPRF)—[VI]
- Dummy for governor membership of Our Home is Russia (NDR)—[VI]
- Dummy for governor membership of LDPR—[VI]
- Dummy for governor supported by the Communist party—[V]
- Dummy for governor supported by a centrist party—[V]
- Dummy for governor supported by 'party of power', that is, by the inner circle of power in Moscow (i. e. mainly Our Home is Russia)—[V]
- Dummy for governor supported by LDPR—[V]
- Dummy for head of legislature's affiliation to Communist party—[V]
- Dummy for head of legislature's affiliation to a centrist party—[V]
- Dummy for head of legislature's affiliation to 'party of power', that is, to a party close to the inner circle of power in Moscow (i. e. mainly Our Home is Russia)—[V]
- Dummy for head of legislature's affiliation to LDPR—[V]
- Duma election score (1995), as compiled by MFK Renaissance. This score increases with the electoral performance of reform-minded political parties or candidates
- Presidential election score (1996), as compiled by MFK Renaissance. This score increases with the 1st round electoral performance of reform-minded candidates
- Dummy for regions where Zyuganov won in second round of 1996 presidential election

H2

- Taxes collected per capita (compared with the average of the Russian Federation, i.e. RF = 1), 1994–96—[IV]
- Expenditure provision, i.e. ratio of tax collection to budget expenditure, 1994–96—[IV]

Measures of Economic Reform

H3

- Degree of food price regulation (higher score means more regulated), 1996—[IV]
- Proportion of goods and services with regulated prices, 1996—[IV]

H4

- Share of private enterprises in trade, catering and household services (% of total enterprises in these sectors), 1996. This variable has been used as a proxy for small-scale privatisation—[IV]

316 *Rudiger Ahrend*

- Growth in the number of enterprises, 1991–98—[Ia]
- Number of small businesses per capita (compared with the average of the Russian Federation, RF = 1), 1995–98—[Ia]

H5

- Industrial production subsidies in budget spending (%), 1994–1997—[IV]
- Agricultural subsidies in budget spending (%), 1994–97—[IV]

H6

- Foreign direct investment per capita, 1995–98—[Ia]

Initial Conditions

H7

- Oil production (per capita), 1995—[Ia]
- Gas production (per capita), 1995—[Ia]
- Coal production (per capita), 1995—[Ia]
- Natural resource potential index, compiled by [V], 1997

H8

- Initial (1994) share of exports to foreign countries, % of GRP—[Ib, Ia]
- Initial (1993) share of power sector (as % of total industrial output)—[Ib]
- Initial (1993) share of fuel sector (as % of total industrial output)—[Ib]
- Initial (1993) share of ferrous metals sector (as % of total industrial output)—[Ib]
- Initial (1993) share of non-ferrous metals sector (as % of total industrial output)—[Ib]
- Initial (1993) share of machinery sector (as % of total industrial output)—[Ib]
- Initial (1993) share of chemical sector (as % of total industrial output)—[Ib]
- Initial (1993) share of wood sector (as % of total industrial output)—[Ib]
- Initial (1993) share of building materials sector (as % of total industrial output)—[Ib]
- Initial (1993) share of glass sector (as % of total industrial output)—[Ib]
- Initial (1993) share of light industry (as % of total industrial output)—[Ib]
- Initial (1993) share of food sector (as % of total industrial output)—[Ib]
- Initial (1993) share of flour milling and mixed fodder industry (as % of total industrial output)—[Ib]

H9

- Dummy for presence of a major port (sea or river) in the region
- Dummy for all European Russian regions, i.e. excluding regions in the Caucasus and East of the Urals
- Degree of longitude on which the regional capital is situated
- Dummy for St Petersburg city

- Dummy for 'red belt', regions, as compiled by Political Scientists Aleksei Sitnikov and Andrei Kunov for this study

H10

Index proxying a region's degree of urbanisation, compiled by MFK Renaissance 1998
Population density, 1990—[Ib]

Variables used as instruments (and not defined before)

- Potential for ethnically based separatism, proxied by the population share of the original (non-Slavic) ethnies of the region (e.g. percentage of Tartar nationals in Tartarstan), 1989—[Ib]
- Proxy for the initial (1993) share of industry in total output^{A3}
- Proxy for the initial (1993) share of agriculture in total output

A1. We constructed real GRP in the following way: we first constructed value added of the main economy sectors (industry, agriculture, construction and services) by region. Value added of a sector in the region was calculated from regional sectoral output using the Russian average share of value added in total output of this sector. We then transformed the value added of each sector in the region into 1994 constant prices by using the national sectoral deflators. Finally we added up the results obtained for each region, thus obtaining a measure for GRP in 1994 constant prices.

A2. Including both secondary and specialised secondary education.

A3. As regional sectoral value added data are not available, these proxies are calculated by adding up services, agriculture, construction and industrial production in a region, and by taking the share of the relevant sector (e.g. industry) with respect to this sum.