

# **Property Rights in Land and Income Growth in Russia, 2000-2008**

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**NOT FOR CITATION**

## **Abstract**

This paper argues that the timing of regional adoption of a key market-oriented reform in post-Soviet Russia, property rights in arable land, has an impact on regions' annual growth rate of income per capita. By Constitutional provision in 1993, individuals gained the right to own land. However, many of the then 89 regions took advantage of joint federal and regional jurisdiction over land and parliamentary restrictions on its use and disposal to delay the start date of implementation (Wegren 2009; Shagaida 2005). Despite over a decade of liberal reform of land rights, beginning in the late 1980s, by 2000 only 15 regions had adopted regulations governing its purchase and sale and others had imposed strong limitations on the right of disposal. Our econometric model compares the performance of these early adopter regions with those not enacting regional land rights at that time in a study for the years 2000 through 2008. The database, compiled for the purpose of this paper, draws on 75 regions in the Russian Federation. It contributes to the growing literature on institutions and economic performance.

## Introduction

This paper argues that the passage into law of a key market-oriented reform, property rights in land, has an impact on regions' annual growth rate of income per capita, distinguishing early adopters of the law in post-Soviet Russia from regions that did not confirm federal law in the 1990s. By Constitutional provision in 1993, individuals gained the right to own land. However, many of the then 89 regions took advantage of joint federal and regional jurisdiction over land and parliamentary restrictions on its use and disposal to delay the start date of implementation (Wegren 2009; Shagaida 2005). Despite over a decade of liberal reform of land rights, beginning in the late 1980s, by 2000 only 15 regions had adopted regulations governing its purchase and sale and others had imposed strong limitations on the right of disposal. Our model captures the importance of this variance. The database, compiled for the purpose of this paper, draws on 75 regions in the Russian Federation. It contributes to the growing literature on institutions and economic performance.

Emerging from previous work (Leonard et al, 2016), which associates welfare effects and good governance in the Russian transition, this paper assesses the impact of formal adoption of property rights in the arable lands. The enforcement of competitive access to land, property rights, is an explicit institutional component of growth (Keefer and Knack 2000). Property rights are key among formal rules, as in constitutions, regulations and laws, distinguished from informal rules, as in mores and conventions, comprising market supporting institutions in the classical literature (Commons 1950; Knight 1952; Coase 1960; and North 1990). Together, they encourage stability and sustained investment in physical and human capital and better technologies (Acemoglu, Johnson and Robinson, 2002; Acemoglu and Johnson, 2003). In Russia, in particular, as empirical research has demonstrated, price and trade liberalization and other liberalizing measures, including property rights protection, had discernible effects on the regional economy after recovery from recession in the 1990s, although afterwards, effects of the package of reforms on regional growth probably diminished (Berkowitz and de Jong, 2011; Ahrend, 2005; Popov, 2001). We test for effects in regard to land rights and find that early regional adoption did matter once growth accelerated after 2000. Our study covers the years 2000 to 2008, a limitation introduced mainly because this was a period of very rapid and stable economic advancement for the country as a whole with an annual growth of GDP of about six percent. In 2009, in the wake of the global financial crisis, economic growth plummeted to -7.8 percent, breaking the stationary growth process of the previous eight years.

We argue that that regions with more broadly liberal economic institutions (presumably generated late in the communist era) were more likely to have adopted formal land laws earlier in the transition era, beginning in 1991, and encouraged both formal and informal enforcement, leading to higher annual average economic growth rates in our period, 2000-2008. We take two approaches to determine the association. First, we explicitly address the non-random element in the adoption of land laws by using the Instrumental Variable approach. One of our exogenous predictors, for example, explains a region's decision to implement/not implement the federal law in the 1990s by its status as a republic, rather than oblast' (region). Some republics in the far

North, with little agricultural land, had greater incentive to restore the private sector in agriculture after the end of Communism. Others, including some republics of southern Siberia, and the trans-Volga steppes strongly resisted restoring land rights to the private sector out of long traditional collective use of the land for herding, continuing to the present, since households traditional depended on livestock ownership. In the Republics of Dagestan and Kabardino-Balkaria, for example, the start-date of implementation of the land law was postponed for 49 years; in the Chechen Republic, until 2020. However, on the whole, there was significant advancement by republics with the land law, including, for example, Tatarstan, Bashkortostan, Mari El, Mordovia, and Udmurtia.

The second predictor is region's agricultural production in 1991. The hidden market values of agricultural plots in agricultural regions were higher and there probably were some political and economic interests in such regions that sought a rapid acceptance of the full legal framework for ownership rights and transaction of agricultural lands.

Our results support our identification strategy. Our two predictors are strongly and positively correlated with the propensity of adoption of land laws by regions in the 1990s. For instance, republics had a 45 percent point higher likelihood of acceptance of land laws in the Russian Federation by the 2000-2008 period. Using these exogenous variations in the propensity of land law adoption in the 1990s, we conclude that of a 21.2 percent growth in annual income that the average region of the Russian Federation experienced in the period between 2000 and 2008, 6.8 percentage points can be associated with land laws. In support of our main finding, our supplemental analysis shows that agricultural production had also increased in the regions with land laws relative to non early adopters.

This paper is organized as follows. After this introduction, in part 2, we review the literature on three main issues relevant to our argument, one, how institutional change encompasses a legacy effect with outcomes for slowing or accelerating growth; two, the association of land rights and economic growth, and three, the regional variance in the Soviet era, which lays the historical foundation for the post-Soviet regional divergence. In part 3 we present the background to the development of a model, which is the basis along with methodological and data discussion of part 4. The final section is a conclusion.

## **2. Literature Review**

### ***Institutional Change: Adaptation to New Rules***

There is substantial conceptual and empirical research showing market-oriented institutions to be superior to extractive institutions in fostering long-run sustainable growth. In their account of the great divergence in the "Reversal of Fortune," Acemoglu, Johnson and Robinson (2002: 1235, 1262) show from 91 country histories, 1500 to 1995, that colonial take-overs and new policies and conditions that support institutions of private property can change the trajectory of

long-run economic development. Introduced in previously poor areas, market-based institutions brought about sustainable growth. More recently, Schein (2012) traces the history of Palestine from 1516 to 1948, for example, and he finds significant variance in outcomes of two kinds of regimes, those with enforced user-rights and those with extractive regimes (p. 119): “When there were private property institutions the economy prospered, while when there were extractive institutions, the economy stagnated.”

Research on the impact of institutions includes, as in this paper, concern with the measurable impact of newly established institutions, as in the post-Soviet states. Empirical evidence thus contributes to policy review of whether institutions can be effectively changed by exogenous events, such as the imposition of new laws. There is some consensus that institutional change is generally more evolutionary, although there is a proliferation of different understandings within a general common framework. Kingston and Caballero (2009, p. 152) summarize a consensus emerging around the work of Aoki (2001), Grief (2006) and Grief and Laitin (2004) that both exogenous shocks and endogenous parameter changes play a strong role in driving behavior reflecting institutional rules that evolve in a complex process of punctuated equilibria. The endogeneity of parameters of change, following a design developed by a government, constitute a behavioral equilibrium that settles in for a period, after changes have become embedded, and then as parameters respond, again, the equilibrium could shift in an adaptive way.

The common example of a design of reform imposed from above and then adapted over periods of parameter adjustment is the Central and Eastern European experience of market-oriented “big bang” policies; much research attests to the non-random nature of the process, showing diverse results. In historical perspective, the extractive regimes that were overthrown or replaced by a new design of laws showed varying degrees of their acceptance and staged development of functioning market economies. Theorists tend to agree, that “mental models” change gradually, and that the process is one of adaptation (Polterovich, 2001; de Jong and Mamadouh, 2002; Roland, 2004; Oleinik, 2006; Zweynert and Goldschmidt, 2006). Berkowitz et al (2003b) show the nonrandom processes in the reshaping of law by introducing the concept of a transplant effect of the process in the reshaping of law by introducing the concept of a transplant effect.

To summarize, a best practice institutional reform, imposed by design, faces low demand, until transaction costs in the emerging market economy are raised for old property rights and lowered with enforcement of the new laws. The viability of the new law depends on how significantly behavior is modified to accommodate important changes in market values (Demsets 1967, p. 350). The internalization of externalities has a local dynamic (See also Denzau and North 1994; Williamson 2000; Kingston and Caballero 2009; Crawford and Lijphart 1995; Elster et al 1998; Galligan and Kurkchian 2003). Across the transition region, different degrees of internalization produced highly disparate country outcomes and a large gap in income among countries, widening over time, in Central and Eastern European transitional reforms (EBRD Transition Reports (1995- ). In Russia, the new institutional design for property rights in Russia

in the early 1990s accompanied by the opening of the economy imposed benefits and costs on the collective and state management of the land, and the pace of internalization of these costs varied in different regions. Some regions reinforced laws protecting local interests by allowing the extractive political economy to persist; these non-adopters delayed the “start date” of private ownership of arable, some by as much as forty-nine years.

### ***Land Rights and Growth Effects***

A basic tenet of the literature is that property rights in land affect economic behavior. “Tenure institutions have the potential to create wealth by promoting investment, by reducing enforcement costs, and by extending gains from trade” (Alston and Libecap 1991, p. 61). The positive linkages between growth and institutions by investment are indirect. Dawson (1998, p. 605) identifies from Besley (1995) three ways in which property rights affect investment (p. 605): Property rights enforce protection by the state of the profits of investment from expropriation by the state or other individuals. Also, through credit markets and the enforcement of contracts they can reduce barriers to contractual arrangements; finally, by facilitating these financial and enforcement arrangements institutions promote trade and thus increase the return to investment.

Property rights also affect growth through productivity. Although technology evolves exogenously, institutions have a fixed effect on the level of productivity (p. 606) in cross country literature. Generally, country fixed effects identifying cross-country differences in institutions have been widely used in cross-country literature showing discernible differences among countries. In our study, we also control for the federal district-level fixed effects to control for the possible cross-district differences in institutions. There are major works, for example, assessing the impact of such institutional characteristics as corruption (Mauro 1995; Keefer and Knack 1995), political instability (Barro 1991); and civil liberties (Kormendi and Meguire 1985). Rodrik (2008) shows that although agricultural production, investment decisions and exports are quite sensitive to price incentives, as neoclassical literature predicts, institutions of participatory democracy provide the stability and predictability that make entire economies more resilient to shocks and provide better distributional outcomes (Rodrik 2000).

### ***Regional Disparities in Russia***

In regard to regional growth and institutions in advanced economies, policy literature focuses on the important local characteristics of institutions, in particular, human capital development, which provides a stimulus to innovation (see review in Amin and Thrift 1995). The growing literature on regional innovation policy shows the sweeping application of these assumptions for current European cohesion policy and spending, now dominated by “smart specialization” and local innovation strategies (Faroule et al 2011; OECD 2006, 2009, 2011). Characteristic of this literature, however, is the understanding that within Europe, fundamental market institutions, including property rights, do not significantly vary. We develop an argument, as in Banerjee and

Iyer (2009) and Berkowitz et al (2012) and Berkowitz et al (2003a and 2003b) for large federations in less developed countries that regional variance can illustrate the impact of institutional variance in respect to fundamental legal institutions. A within country study, that is, can thus avoid some of the omitted variable problems generally associated with cross-country studies of the impact of institutions. Despite a long geographic unification of Russia in a single social and political regime, there were persistent historical differences among these regions despite a largely similar cultural framework and regime type.

In the Soviet era, for example, the differences were marked and closely studied. Divergence was observed by social indicators, for example, social cohesion (Kennedy et al 1998). In regard to the ethnic republics, a striking divergence in institutional indicators was well established. In other words, despite the ideologically driven subsidy policies to eliminate the influence of geographical distinctions on distribution, there were persistent regional disparities highlighted in research on income, social services and governance (Bahry 1998; Koropeckyj 1972; Nove 1969; Massel 1976; Schroeder 1973a, 1973b; Morton and Tokes 1974). In the early 1990s, the union broke apart and was reconstituted in a fragile statehood: regional leaders battled with one another, a number of Union Republics declared their sovereignty and left the Russian Federation, and other regions and republics within the Federation were instructed by then President Boris Yeltsin to take as much sovereignty as they could swallow.

### **3. Background: Land Reform Across Regional Divides**

The right of private ownership for land used in agricultural production was allowed in Russia in the 1990 USSR Law “On Land Reform” (passed in October 1990) and the law “On Peasant Farms” (December 1990), which legalized independent entrepreneurship and the distribution to members collective and state farms (kolkhozes and sovkhozes) of land shares – paper certificates of entitlement to a certain amount of land in an unspecified location. The decisive turning was the 1993 constitutional grant of individual land rights in Russia. However, this constitutional grant of rights permitted regions discretionary authority over the date of implementation and degree of regulation. Only in a new land code in 2002 were regions obliged to begin regulatory procedures. It is important to underscore, as in Lerman and Shagaida (2007, p. 14), that the land law in Russia remains “embryonic” and, in practice, “severely circumscribed by the inadequacy of administrative and technical infrastructure.” From the 1990s, the break up of large farms, or, the realization of individual rights to dispose of land, was legally encumbered by parliamentary restrictions and public support of a regulated land market (Wegren 2002). Only after parliament passed a Law on Transactions in Agricultural Land (2003), was the final legal barrier to arable land sales removed even at the federal level, allowing the use of agricultural land as collateral. In 2004, regions forced to bring their legislation into conformity with federal law (Shagaida and Lerman, 2008; Leonard 2011).

In other words, the slow pace of the transformation of formal ownership is well documented (Wegren, 2009, Leonard 2011). The impact is as well: Dower et al (2014) write that

restrictions on land ownership affects firms' operations, including access to inputs and markets, and relations with authorities. They show that since property rights are poorly protected, actual land ownership increases firms' vulnerability to hostile takeovers, especially for smaller and/or less profitable firms sitting on valuable land plots.

In the impact of this slow implementation on regional economies, we follow Berkowitz et al (2012), who observe Post-Soviet Russian enormous regional differences in economic growth rates. These regional differences exhibit remarkable correspondence with the formation of new legal enterprises. Berkowitz et al (2012) show the importance of initial conditions for entrepreneurial activity in the 1990s. Although that dramatic effect of the liberalizing package of reforms is not observed in later years, after 2000, we show that in regard to land rights, it is an enduring effect. None of the literature, to our knowledge, addresses the endogeneity of the introduction of disposability of landed property in the regions—and the protection of the security of those rights—through the early 2000s.

We examine the penetration of competitive land rights in post-Soviet Russia by employing the Instrumental Variable approach and demonstrate that the regions that adopted the land laws in the 1990s experienced higher growth in per capita income in the 2000s, a period of unprecedented economic growth across the Russian Federation. We conjecture that regions with more broadly liberal economic institutions more likely adopted land laws in the 1990s, and their experience of higher annual average economic growth rates in the 2000s was due to the same institutional forces. To separate the effect on the average growth in income of these unobserved forces from the direct effect of land laws, we use two exogenous predictors that may explain decisions to adopt the land laws by these regions in the 1990s. The first predictor is region's republic status. In the early period of transition, some republics had greater incentives to restore the private sector in agriculture; as a result, they may have been more willing to adopt land laws to enable free transactions of agricultural lands and permanent inheritable use of lands for private ownership. Another reason is that the post-Soviet republics of southern Siberia and in the trans-Volga steppes experienced particular hardship from collectivization. However, in other republics, in view of the importance and historical significance for households of the high-value livestock sector, there was opposition to confirming privatization of the arable (pastures) due to the collective or clan organization of farmland for herding (See Polanyi, 1957). The second predictor is the region's agricultural production in 1991 that measure the hidden market values of agricultural plots. Regions with higher hidden market values of agricultural plots should have higher incentives to bring market forces in the agricultural sector.

## **Model & Data**

To estimate the effect of land right laws on income growth in the regions of the Russian Federation, we utilize the Instrumental Variable approach. The  $i$ th region's growth in income in the period between 2000 and 2008,  $I_i$ , is a function of whether or not the region adopted the land right law in the period between 1991-1999,  $D_i$ , other region specific characteristics included in

vector,  $X_i$  and the error term,  $e_i$ . We use the conventional assumption that the error term is normally distributed with mean, 0 and variance,  $\sigma^2$ .

$$I_i = X_i\beta_1 + \beta_2 D_i + e_i. \quad (1)$$

We believe that the indicator of the land right law adoption,  $D_i$ , is correlated with some fixed component of the error term,  $e_i$ . As a result, the parameter of interest,  $\beta_2$ , will be biased using the conventional OLS estimator. To deal with this statistical issue, known as the endogeneity problem, we introduce in our empirical model the vector of exogenous (predetermined) variables,  $Z_i$ , that by our assumption are strongly correlated with  $D_i$ , but are orthogonal to the fixed component of the error term,  $e_i$ . Assuming the linear relationship between  $Z_i$  and  $D_i$ , our first stage equation in the IV model is the following:

$$D_i = X_i\gamma_1 + \gamma_2 Z_i + u_i. \quad (2)$$

#### *Variables included in $X_i$*

The conventional economic growth theory provides rationale for the variables that should be included in vector  $X_i$ . The main determinant of economic growth is the level of investment in new technologies. However, diffusion of new technologies primarily depends on the availability of an educated workforce (Hanushek and Woßmann, 2007). In our analysis, from Berkowitz and DeJong (2011), we introduce the proportion of highly educated individuals in the workforce as the variable approximating the average educational attainment of the workforce.

Another important determinant of income growth is the aggregated health status of the workforce. There is an on-going debate whether good health causes higher income or high income causes improvement in health; however, Bloom and Canning (2000) provide three possible mechanisms of the health/income gradient. Better health makes a worker more productive and increases investment in human and physical capital. Using this taxonomy, we expect that the regions with the healthier workforce should experience higher income growth than the regions with the less healthy workforce. In our analysis, we use the mortality rate in the population, predetermined in 2000, before the measure of income growth, to make inference about the given relationship.

According to the conventional economic growth model, the more prosperous regions should grow slower than the initially disadvantaged regions. The importance of controlling for initial conditions in understanding the differences in economic performance of Russian regions is discussed in Berkowitz and DeJong (2011) and Leonard, Nazarov and Vakulenko (2016). We control for two conventional initial conditions: economic growth, measured as the change in GRP in the period between 1993 to 2000 and average income in 1990. The latter variable is also adopted from Berkowitz and DeJong (2011) and controls for the initial condition of the region before entering the post-Communist transition.

Finally, according to the President's decree of 2000, regions in the Russian Federation

are grouped into *okrugs*, federal districts. Initially, the president of the Russian Federation established seven federal districts (Central, Far East, Volga, Northwest, Siberia, Urals and Southern). The main goal was to consolidate the operation and governance of federal government agencies. In each federal district a presidential representative is appointed by the President “to ensure implementation of the constitutional powers of the President of the Russian Federation<sup>1</sup>.” We assume that the implementation of federal economic policies may be correlated across regions of a given district, and to control for unobserved heterogeneity across federal districts, we introduce the federal district fixed effects in our analysis.

#### *Variables included in $Z_i$*

We include two instrumental variables in vector  $Z_i$ : a region’s republic status and agricultural production in 1991. On the one hand, in the early period of transition, republics may have had higher incentives to restore the private sector in agriculture; as a result, they may have been more willing to adopt land laws to enable free transactions of agricultural lands and permanent inheritable use of lands for private ownership. On the other hand, Shagaida and Lerman (2008) observe that the actual implementation of the land right laws in ethnic-minority regions, which are mostly republics, was initially very slow. Shagaida and Lerman provide evidence that the privatization rate of agricultural lands in some ethnic-minority regions (Bashkiria, Dagestan, Kabardino-Balkaria, North Ossetia, Chechnya, Tyva, Ingushetia, Kalmykia) was close to zero. In Table 1, we report the time frame of the land right law adoption by regions. In the 1990s, according to our research and in Shagaida & Lerman’s list, only Bashkiria has a law allowing transactions of agricultural lands. All other regions in the list adopted the laws in later periods. So we agree with the Shagaida and Lerman proposition that some ethnic-minority regions may set barriers locally to the diffusion of land right laws. However, according to their research, other ethnic-minority regions with republic status adopted land right laws in the early stage of transition and duly implemented them. It worthwhile to mention that due to the unstable geopolitical situation in the Chechen Republic and the Republic of Ingushetia, for our period, we exclude these republics from our analysis, similar to other studies that use data on Russia’s regions (Berkowitz and DeJong, 2014; Leonard, Nazarov and Vakulenko, 2016).

The second predictor is a region’s agricultural production in 1991. Our main rationale for this instrumental variable is that we believe that the hidden market values of agricultural plots in agricultural regions were higher and there probably were some political and economic interests in such regions that sought a rapid acceptance of the full legal framework for ownership rights and transaction of agricultural lands. Shagaida and Lerman (2008) demonstrate that the privatization rate in regions is positively correlated with the share of agricultural lands in Russian regions. This fact provides an indirect support for our identification strategy. The regions with a higher share of agricultural lands are predominantly those with a higher initial level of agricultural production in the Soviet Russia.

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<sup>1</sup>Ukaz Prezidenta RF ot 13.05.2000 N 849 'O polnomochnom predstavitele prezidenta Rossiiskoi Federatsii v federal'nom okruge'. Graph.document.kremlin.ru (2000-05-13). Retrieved on 2013-08-20.

The key variables used in this analysis are drawn from 'Regions of Russia. Socio-economic indicators: 2012' – the statistical handbook, study by Berkowitz and DeJong (2011), and other sources. Out of 83 regions, we consider only 75 regions in our empirical investigation: for economic, political and geographical reasons, as in Berkowitz and DeJong (2011), we omit from our analysis observations for eight regions: Chechen Republic, Republic of Ingushetia, and six Autonomous okrugs or oblast' such as Nenets, Yamalo-Nenets, Khanti-Mansi, Jewish and Chukotka. The numbers reported in Table 2 shows that the average income growth in the period between 2000 to 2008 in the Russian Federation was 172 percent in the regions that adopted the land right laws in the 1990s, which is almost 4 percent point higher than in counterpart regions. Comparing the average income growth between the regions that adopted the laws in the 1990s and 2000s with the regions that never accepted the law, we also observe a substantial difference favoring the regions with land right laws. Finally, Table 3 provides descriptive statistics for key independent variables used in the analysis.

## **Results**

### *First-stage Regression*

We start our discussion with the results for the first stage regression, where we estimate the regression equation as outlined in (2). Our main goal is to show that our instrumental variables are not weakly correlated with the propensity to adopt the land law. We also provide a robustness check by extending our analysis to the regions that adopted the law either in the 1990s or in the 2000s. We presume that the effect should be stronger for the regions that adopted the law earlier. In Table 4, the conventional t-statistics demonstrate that both instruments are strongly correlated with the dependent variable regardless of the model specification. First, the regions with high agricultural production in the first year of transition are more likely to adopt the law. Second, the regions with republic status have about a 45% point higher likelihood of adopting the law in the 1990s and about a 63% point higher likelihood of adopting the law in the first 18 years of transition. The signs of the parameters associated with the instrumental variables have theoretically expected directions.

Additional support of the choice of instrumental variables in our analysis is from the conventional F-test of joint significance of instrumental variables in the first stage equation. The value of the F-statistic of joint significance of both instruments in the first specification is 16.8, a value that is above 10, the recommended threshold agreed in the social science literature (Staiger and Stock 1997).

### *Second-stage Regression*

In Table 5, we report the estimates of the second stage equation outlined in equation (1). Our primary interest is the parameter associated with the adoption of the land rights law. In this table, we report results for the preferred IV specification along with the conventional OLS.

First, if we ignore the possible correlation between  $D_i$  and the fixed component of the error term,  $e_i$ , relying on the results of OLS regression, we find a small and statistically

insignificant association between land laws and income growth. Of 169 percent growth in income in the period between 2000 and 2008, only 18 percent can be explained by the land rights law using this conventional approach. However, results of the IV approach suggest a stronger association between the two variables. Our results show that land right laws may explain about a 55 percent growth in income in the Russian regions in our period. Thus, the results suggest that of a 21.2 percent growth in annual income, experienced by the average region of the Russian Federation between 2000 and 2008, 6.8 percentage points can be associated with land laws.

There are other results compatible with the conventional economic growth theory. First, our results support the absolute convergence hypothesis. The initially poor regions experience higher growth in income than the more developed regions. A 1 percent point higher annual GRP growth in the period between 1993-2000 leads to about 0.5 percent lower annual growth in income in our period. Similarly, we observe support for the absolute convergence hypothesis based on the sign of the parameter associated with the initial average income measured in 1990. Initially richer regions experience lower income growth in the later years.

Our results also show that the regions with a higher mortality rate experience lower income growth in our period even after controlling for district fixed effects and differences in initial average income and economic growth. An increase in the mortality rate by one individual per 100,000 decreases the annual income growth by 0.46 percent. Bloom and Canning (2000) discuss, among three mechanisms that may explain this gradient, an increase in productivity due to better health, resulting in an increase in income. This explanation seems plausible, since we control for the proportion of highly educated workforce, a variable that may capture other mechanisms as well.

At first glance, our evidence seems to contradict that reasoning: there is a negative sign on the proportion of highly educated in the population, controlling the effect of education on income growth. The results show that the regions with the initially more educated workforce experience much lower income growth in the study period. However, we note positive associations in the modern literature for developed countries (Hanushek & Woessmann, 2007). Using Pritchett (2001), we speculate that possibly government policies in the Russian Federation had a perverse economic effect on the contribution of the highly educated workforce, such that this group of workers were not the engine of economic growth, or possibly, the quality of Soviet education was not adaptive to markets, even detrimental for the future market-based environment, and it depressed economic growth in the early years of transition.

## **Conclusions**

There is an on-going debate in the media whether it is beneficial for transitional economies to permit open trade of agricultural lands. There are pros and cons but the principles of institutional economics clearly postulate that allowing for property rights in the arable can serve as one of the main engines of economic growth for most societies transitioning to a market-based economy. This study aimed to test this postulate using longitudinal data on Russian regions from 2000 to 2008. Our study demonstrates that the significant part of the unprecedented income growth that

the population of the Russian Federation experienced from 2000 to 2008 is associated with regional initiatives in confirming federal law allowing property rights, including sale and purchase, of arable land.

This study has a number of limitations. We only test whether the adoption of land laws in regions has an impact on income growth. However, the adoption of growth compatible laws does not always translate into growth. Effectiveness of policy will depend on its actual implementation. Some political (bureaucratic) and social forces (for example, in ethnic-minority regions) may create offsetting effects reducing the effectiveness of land rights initiatives in the regions. One of the ways to explore this possibility is to investigate to what extent the privatization rate of agricultural lands or the number of transactions involved agricultural lands has affected growth in income or any other economic outcomes. We are planning to tackle this research question in our future research.

The other two important limitations of this study are the assumptions underlying the construction of the main dependent variable and the choice of instrumental variables. Titles and wording of regional laws differ substantially across regions. In this study, we ignore any differences in regional land laws and assume that the effect of the laws across regions should be the same regardless of the differences in titles and wording. Finally, someone may doubt the relevance of the assumption that the instrumental variables used in our analysis are uncorrelated with the unobserved factors in the income growth equation. Although we do not perceive any issues with the first instrumental variable with respect to this criticism, agricultural production in 1991, we are unsure if republic status affected regional income indirectly by other mechanisms than property rights in land.

**Table 1. Time Frame of Law Adoption by Regions**

1991-1999	2000-2004	2005-2008
Voronezh Oblast', Moscow Oblast', Republic of Karelia, Kaliningrad Oblast', Krasnodar Krai, Republic of Bashkortostan, Mari El Republic, Republic of Mordovia, Republic of Tatarstan, Udmurt Republic, Samara Oblast', Saratov Oblast', Sverdlovsk Oblast', Tyumen Oblast', Chelyabinsk Oblast'	Lipetsk Oblast', Ryazan Oblast', Leningrad Oblast', Pskov Oblast', Republic of Adigeya, Republic of Kalmykia, Rostov Oblast', Republic of Dagestan, Karachay-Cherkess Republic, Republic of North Ossetia, Stavropol Krai, Chuvash Republic, Orenburg Oblast', Buryat Republic, Altai Krai, Novosibirsk Oblast', Primorsky Krai	Bryansk Oblast', Vladimir Oblast', Kursk Oblast', Tambov Oblast', Komi Republic, Murmansk Oblast', Republic of Ingushetia, Kabardin-Balkar Republic, Chechen Republic, Tuva Republic

**Table 2. Income Growth Rate in 2000-2008 by Period of Law Adoption**

Description		With Law	Without a Law
1991-1999	Mean	172.2	168.4
	SD	11.33	6.391
	N	15	60
1991-2008	Mean	177.3	159.8
	SD	8.250	7.094
	N	40	35

**Table 3. Descriptive Statistics on Key Variables**

Variables	Mean	S.D.
Income Growth from 2000-2008	169.1	48.18
Republic Status	0.267	0.445
Agricultural Production in 1991	3.468	2.284
Income in 1990	0.218	0.07
Mortality Rate	15.82	3.44
Proportion of Highly Educated	13.24	1.98
Growth Rate in 1993-2000	-2.56	2.91



**Table 4. Propensity of Land Law Adoption (First Stage of IV)**

VARIABLES	1991-1999	1991-2008
Ag. Production in 1991	0.103*** (0.019)	0.115*** (0.026)
Republic Status	0.451*** (0.106)	0.625*** (0.147)
Proportion of Highly Educated Ind.	0.079*** (0.020)	0.072** (0.028)
Growth in 1993-2000	-0.008 (0.013)	-0.018 (0.018)
Income in 1990	0.169 (0.736)	-0.906 (1.021)
Mortality Rate in 2001	-0.004 (0.015)	-0.032 (0.021)
Dal'niy Vostok	-0.305* (0.183)	-0.415 (0.253)
Privolzh'e	0.068 (0.118)	-0.262 (0.164)
Severo-Zapad	0.169 (0.124)	0.337* (0.172)
Sibir'	-0.354*** (0.124)	-0.441** (0.172)
Ural	0.611*** (0.172)	0.241 (0.239)
Yug	-0.468*** (0.150)	-0.283 (0.208)
Constant	-1.227*** (0.462)	-0.173 (0.642)
F-Statistics	16.82	12.76
Observations	75	75

**Table 5. Factors Associated with the Growth Rate in 2001-2008**

VARIABLES	OLS		IV	
	1991-1999	1991-2008	1991-1999	1991-2008
Land Law	17.6 (11.4)	16.0* (7.9)	55.1** (24.2)	41.9** (20.4)
Proportion of Highly Educated Ind. Growth in 1993-2000	-8.4*** (1.8)	-8.1** (2.3)	-10.7*** (3.1)	-9.4*** (2.9)
Income in 1990	-3.7 (2.0)	-3.6* (1.8)	-4.2** (1.7)	-3.7** (1.7)
Mortality Rate in 2001	-393.9 (252.5)	-374.3 (256.9)	-377.7*** (100.2)	-330.1*** (104.4)
Dal'niy Vostok	-4.4 (4.3)	-3.8 (4.4)	-3.7* (1.9)	-2.3 (2.2)
Privolzh'e	27.0 (26.8)	28.4 (28.5)	39.8 (26.4)	40.2 (26.5)
Severo-Zapad	-32.2* (13.7)	-27.2 (14.4)	-43.8*** (16.9)	-28.0* (15.0)
Sibir'	-19.4*** (3.3)	-22.1*** (4.7)	-21.9 (16.6)	-28.5* (17.1)
Ural	5.8 (16.5)	6.5 (16.2)	16.7 (18.3)	15.9 (18.3)
Yug	-20.7 (14.2)	-13.2 (15.0)	-43.2 (27.5)	-18.2 (23.3)
Constant	-13.3 (33.4)	-17.2 (30.7)	-2.9 (21.2)	-15.6 (19.9)
	431.2** (123.4)	408.4** (131.6)	438.1*** (56.1)	376.7*** (60.6)
Observations	75	75	75	75
R-squared	0.418	0.424	0.357	0.372

Robust standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

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