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William Pyle

The ownership of industrial land  
in Russian cities:  
Explaining patterns of privatization  
across regions and firms



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William Pyle\*

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### Abstract

The voluminous literature on the privatization of Russian industry overlooks, almost completely, the story of enterprise land rights – a story that does not jibe well with the standard narrative of post-Soviet reform. This paper explains the path that has led to significant inter-regional variation in the ownership status of lands underneath urban industrial enterprises. It then introduces unique data from a survey of 359 large industrial firms across several dozen of Russia's largest cities to explore why some firms have purchased their production plots whereas others continue to lease or hold these lands under the old Soviet system of tenure. In exploring both inter-regional and inter-firm variation in land rights, we find evidence consistent with the proposition that the decisions of regional officials and (the managers and owners of) firms are guided by securing rights over real estate rents.

Keywords: urban land, property rights, Russia

JEL codes: K11, L6, P26, P31, R33

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\*William Pyle, Middlebury College, Economics Department, email: [wpyle@middlebury.edu](mailto:wpyle@middlebury.edu)

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## The ownership of industrial land in Russian cities: Explaining patterns of privatization across regions and firms

### Tiivistelmä

Yritysten yksityistämistä Venäjällä käsittelevässä runsaassa kirjallisuudessa on liki täydellisesti jätetty huomiotta teollisuusyritysten käyttämän maan yksityistäminen. Tässä tutkimuksessa kuvaillaan teollisuusyritysten maanomistusoloissa ilmeneviä merkittäviä alueellisia eroja. Lisäksi tutkimuksessa käytetään hyväksi ainutlaatuista 359 teollisuusyrityksen haastatteluaineistoa selitettäessä miksi jotkut yritykset ovat ostaneet maan itselleen ja miksi toiset vuokraavat sen paikallishallinnolta tai jatkavat neuvostoaikaista hallintaoikeussopimusta. Tulokset viittaavat siihen, että niin paikallishallinnon kuin yritystenkin päätöksiä maanomistusolojen järjestämisessä ohjaa pyrkimys hallita tontilla sijaitsevien kiinteistöjen vuokratuottoja.

Asiasanat: kaupunkien maankäyttö, omistusoikeus, Venäjä

JEL: K11, L6, P26, P31, R33

# 1 Introduction

The voluminous literature on the privatization of Russian industry overlooks, almost completely, the story of enterprise land rights – a story that does not jibe well with the standard narrative of post-Soviet reform. The reputedly rapid privatization of the Yeltsin era was initiated without any changes being made to the tenure status of the land on which enterprises sat. And the Putin years, during which the government’s commitment to privatization was frequently described as having waned, witnessed a wave of sell-offs of state-owned lands to private industry. Despite land accounting for a substantial share of the market value of many privatized firms and the potentially adverse consequences of splitting rights over capital and contiguous land, this story has not been well publicized. None of the major empirical studies evaluating the effects of industrial privatization in Russia, for instance, account for ownership rights over land.<sup>1</sup>

Rights to industrial land are central to the evolution of Russian cities. The Soviet economic model emphasized rapid urbanization and built up population centers whose spatial distribution came to look little like those elsewhere in the world. Because of the suppression of markets and the priorities of planners, a disproportionately large share of urban land was given over to industry (Bertaud and Renaud, 1997; Stanilov, 2007). Though this pattern persisted into the post-Soviet era (Buckley and Mini, 2000; Bertaud and Malpezzi, 2003; Bertaud, 2004), evidence has been accumulating that as the share of industry in the economy declines and as state control over valuable urban land is weakening, the allocation of space across different economic uses is changing (Makharova and Molodikova, 2007; Molodikova and Makhrova, 2007).

A cursory study of enterprise land rights in Russian cities reveals a patchwork quilt of patterns. Some territorial subjects have done much to liberalize land rights and allocation mechanisms; others, in spite of apparent pressure from the federal government, have proceeded much more slowly. Within territorial subjects, and even within single cities, we observe a great deal of variation in the tenure status of enterprise land. Some firms have purchased and now own the land on which they sit; some lease and make regular rental payments to government agencies; and yet others continue to occupy their plots un-

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<sup>1</sup> For example, see any of the studies referenced in the widely-cited literature review of Estrin *et al.* (2009). Sources noteworthy for the mention they give to the ownership of urban industrial land include Boycko *et al.* (1995), Heller (1998) and McKinsey Global Institute (1999).

der the old Soviet-era legal framework. This article seeks to describe and explain both the macro- (*i.e.*, inter-regional) and micro-level (inter-firm) variation in land rights.

Answering why some regions and firms have privatized their industrial plots and others have not is, we believe, critical to understanding the trajectory of Russia's post-communist development. Public ownership of land deprives firms of both an asset that could be used as collateral to secure external financing and an ability to generate restructuring funds from the sale or lease of any excess land. Perhaps more notably, the split of ownership rights over complementary assets – land and capital – may slow enterprise restructuring given the potential for rent-seeking officials to translate control rights into opportunities to enrich themselves and/or pursue political objectives. As Boycko *et al.* (1995) cautioned early in the reform process, “The vagueness of [land] lease contracts offer[s] individual bureaucrats both power over businesses and a steady source of income from bribes ... [They may use their] control over land to influence privatized industrial firms, insisting that they continue to pay for social services and main employment.” These possibilities have the potential to shorten the effective time horizons of enterprise owners, discouraging them from making potentially productive long-term investments.

Following from the logic that rights to urban industrial land offer access to a stream of rents, we seek to understand regional and firm-level variation in those rights in terms of variation in the magnitude of those potential rents. In regions with more valuable real estate, that is, we would expect greater official resistance to the sale of land to private enterprise. Furthermore, conditional on regional policy governing land privatization, we would expect firms sitting on more valuable real estate to purchase their plots so as to secure rights over the rents that those plots generate. Indeed, this is exactly what we find. Regions that are most urbanized and developed (as measured by urbanization rates and per capita income) – *i.e.*, regions that we would expect have the highest urban land values – have witnessed the slowest privatization of industrial lands. And controlling for regional policy, urban industrial firms with more attractive real estate features have been more apt to assume ownership over their primary production plots.

The paper is organized as follows. Section 2 lays out a brief history of federal policy governing industrial land privatization in Russia over the past two decades. Section 3 highlights macro-level trends and inter-regional differences in tenure status. Section 4 introduces a unique survey of large industrial enterprises to explore the firm-level determi-



nants of land plot privatization. Section 5 uses the survey to make a fuller case as to the validity of assumptions that guide the analysis. Section 6 concludes.

## 2 Land policies

Transfer of ownership of non-agricultural commercial lands to the firms that use them was an important step in the transformation of property rights in much of the post-communist world.<sup>2</sup> Many of the Central and East European countries simultaneously privatized enterprise capital and land, often transferring the latter at a nominal fee. Russia followed a different path. The initial measures governing the corporatization and privatization of Russia's state enterprises were applied only to equipment, buildings and other structures. Land plots remained state-owned. A fundamental principle of market economies that the ownership of surface objects derives from ownership of the land underneath (*superficies solo cedit*) was thus ignored. Expediency, not ignorance nor special Russian sensitivities to land tenure issues, seems to have been the main motive. The potential complexities of resolving property boundaries and the perceived need to develop parallel legislation on title registration and a land cadastre struck the architects of Russia's privatization program as potentially too time consuming given the priority they placed, largely for political reasons, on speed.

Russia's 1993 Constitution did lay out the right to private land ownership. But subsequent efforts to give specific form to that language – including Presidential Decrees, chapters in the Civil Code enacted in 1994 and 1995, and disparate pieces of legislation – produced a body of law that was seen as “incomplete ... and sometimes ambiguous” (Kaganova and O’Leary, 1997).<sup>3</sup> Nevertheless, between 1994 and 1997, an estimated 34.5 thousand hectares, across roughly fifty Russian regions, were transferred to private enterprises. In May 1997, a new presidential decree granted regional administrations near full discretion in establishing land sale prices. Thereafter, land prices began to vary significantly across Russia's territorial subjects. With prohibitively high prices in many regions,

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<sup>2</sup> This section draws closely on material presented in Khakhalin and Pyle (2009).

<sup>3</sup> Presidential Decree 1535, issued in July 1994, spelled out procedures for acquiring the lands underneath privatized, non-agricultural enterprises. In conjunction with a 1995 decree that reduced the purchase price of enterprise-occupied land, it paved the way for a number of privatized enterprises to take ownership of their land plots.

the pace of enterprise land privatization decreased dramatically, with many large cities remaining committed to a regime of continued state allocation and ownership (Kaganova, 1998; Limonov *et al.*, 2001). Since local administrations were given greater control to set lease rates on state-owned land than tax rates on enterprise-owned land, they had an incentive to make land privatization procedures complex, expensive and time consuming. In 32 regions, land privatization was banned either by laws that contradicted federal legislation, by popular referenda, or by provisions added to the region's constitution. In Moscow, the city Duma passed a resolution that land plots occupied by privatized enterprises could be leased but not sold.

Most privatized enterprises initially held the lands they occupied under the right of *permanent (perpetual) use*, a Soviet-era form of land tenure, which granted its holder a right to use and build on a parcel but not to dispose of it through, for instance, sale to another party. This form of land tenure, re-enumerated in the Russian Civil Code of 1995, was characterized as permanent only because a termination date was not specified. If the government did dispossess a permanent use holder of its lands, it faced a legal obligation to provide compensation at market value. Many Russian enterprises continue to this day to hold their land under permanent (perpetual) use rights; requiring them to pay a tax, determined by the land's assigned cadastral value, at the same rate as land owners.

A breakthrough in the enterprise land privatization process occurred in 2001 when the Putin administration successfully pushed through the Duma the Russian Federation Land Code. Designed to reinvigorate the process begun in the mid-1990s, it laid out mechanisms to force divestiture of state lands under privately owned structures and to unify titles to land and buildings. For instance, it called for the ownership of real estate objects to henceforth follow ownership of the attached land plot; it granted exclusive right to purchase or lease state-owned land to the owner of the attached real estate object; it gave to private owners of buildings on land plots owned by other private parties the pre-emptive right to purchase the land; and it prohibited the future privatization of real estate objects without the concurrent privatization of the attached plot (Remington, 2002; *Survey of Land*, 2006).

Perhaps most notably, the Land Code sought to bring an end to the rights of permanent (perpetual) land use by requiring private enterprises to convert from the Soviet-era form of land tenure to rights of ownership or lease by January 1, 2004. Further, the upper bound limiting the price that regional administrations could charge for enterprise land was

reduced and their land sale legislation was to be brought into line with federal law. Although this legislative push did lead to an increase in the re-registration of enterprise land rights in many regions, its impact was not as great as anticipated. In an effective capitulation to the resistance the new provisions were encountering, the original deadline for converting rights of permanent use was first pushed back two years to 2006, and then again later to 2008. The deadline now is January 1, 2012.

The response of sub-federal jurisdictions to the 2001 Land Code has varied tremendously. In some municipalities, a substantial share of land – including parcels that were unimproved and those under privatized enterprises – has now been sold off to the private sector; in others, such as Moscow, the municipal government retains an effective ownership monopoly (Kisunko and Coolidge, 2007; *Survey of Land*, 2006). More recently, the long-awaited Federal Law 212, the so-called “Major Amendments to Land Privatization Legislation” enacted in July 2007, seemed to hold out the promise of resolving, once and for all, ambiguities surrounding the ownership of enterprise land. But many local administrations continue to put up resistance. Although Law 212 laid out a new mechanism for establishing the purchase price of plots, requiring that it not exceed 2.5% of the cadastral value (20% in Moscow and St. Petersburg), evidence suggests that some regions responded by rather capriciously increasing cadastral values so as to discourage land purchases. Regional and municipal governments have also maintained an array of formal and informal barriers to limit competitive access to previously unused urban parcels.<sup>4</sup>

### 3 Patterns of ownership at the macro level

In the context of Russia’s entire landmass, urban industrial land may appear to be rather unimportant. As shown in Figure 1, the categories recognized by Russian law, forests and agricultural lands account for nearly ninety percent of the entire land stock. Settlements

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<sup>4</sup> One recent analysis suggests that the inability to access land on transparent terms constitutes as big an obstacle to business development in Russia as anywhere in the world (Muir and Shen, 2005). And among Russian enterprises that have direct experience with them, difficulties in acquiring land are more problematic than problems with bribery, the courts or access to finance, all matters that tend to receive more attention (*Survey of Land*, 2006). Similar results have been found in research focusing on the barriers to small businesses development (Zhuravskaya *et al.*, 2005).

(*земли поселений*), which constitute just over one percent of Russian lands, or 19.5 million hectares, include 7.9 million hectares of urban space (*городские населенные пункты*) in Russia's largest cities and towns.<sup>5</sup> The 16.7 million hectares of industrial lands outside of settlements represent another legal category of relevance to our study.<sup>6</sup>

The reforms set in motion over the past two decades have been such that land in settlements, as well as industrial and agricultural lands, is now divided between those held by private parties – both firms (*юридические лица*) and individuals (*физические лица*) – and those held by the state and municipalities. According to the most recent data, 123.5 million hectares, or 8.5% of all Russian land is now held privately. Within urban settlements, firms now own 247.8 thousand hectares compared to 7108.0 thousand held by the state and municipalities. On industrial lands outside of settlements, 122.7 thousand hectares are in the hands of firms, whereas state and municipalities continue to own 16,635.3 thousand hectares.<sup>7</sup> Since the passage of the 2001 Land Law, this relationship between private and state lands has changed dramatically; the ratio of the former to the latter has grown at roughly annual average rates of 18% and 21% in urban settlements and on industrial lands outside of settlements, respectively. Indeed, looking at enterprise land alone, the past decade could be described as one of rapid privatization, a characterization much at odds with the standard story that in Putin's Russia, privatization “stalled” and the share of Russia's GDP produced by private enterprise fell (Aslund, 2007, 251). Figure 2 captures the six-fold increase from 2001 to 2010 of land ownership by enterprises in urban settlements and industrial lands outside of settlements.

As suggested in the previous section, the national-level data mask a great deal of variation in the pace of non-agricultural land privatization across regions within Russia. Comprehensive data on land ownership at the level of Russia's eighty-plus territorial subjects is hard to come by. The most complete source that we have uncovered was made available on a website maintained by the Federal Agency for the Real Estate Cadastre

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<sup>5</sup> The precise definition of urban settlement varies by territorial subject.

<sup>6</sup> Formally, this category covers lands outside of population centers designated for industry, energy, transport, communications, broadcasting, as well as lands for space-related activities, defense and security and other special purposes. For purposes of brevity, we will refer to this category as industrial land outside of settlements.

<sup>7</sup> Individuals own 578.4 thousand hectares in settlements, which is almost exclusively used for agricultural purposes; individuals own 17.8 thousand hectares on land legally designated as industrial.

(*Roskadastr*).<sup>8</sup> In March 2009, the agency was subsumed by the Federal Service for Registration, Cadastre and Cartography (*Rosreestr*). Of the 7875.5 thousand hectares of land in urban settlements, the *Roskadastr* data designated roughly 45% (3512.2 thousand hectares) as residential-commercial-industrial land.<sup>9</sup> Of Moscow's 109.1 thousand hectares, for instance, roughly 77% was so described, as were half of St. Petersburg's 139.9 thousand hectares.<sup>10</sup>

In the absence of any indicators that describe the uses of land more finely, we interpret the ratio of urban residential-commercial-industrial land owned by enterprises and that owned by government entities as a good proxy for the pace and extent of urban industrial land privatization in a particular region. For Russia as a whole, as well as for the Central Federal District alone, this *urban industrial land ownership index* is 3.7%.<sup>11</sup> Figure 3 illustrates variation in this index across federal districts; the range spans from a high of 4.9% in the Northwest to a low of 1.1% in the Far East. Further illustrating the variation across regions, Table 1 lists each of the twenty "progressive" territorial subjects whose urban industrial land ownership index exceeds the national average. As an additional proxy for urban industrial land privatization, we look at industrial lands outside of population settlements and calculate the ratio between that owned by enterprises and that by government entities (see column 4 of Table 1). For the RSFSR, this measure is 4.4%, or 67.5 thousand of 1526.5 thousand hectares; across regions, the correlation between it and our preferred urban industrial land ownership index is 0.778. In the final column of Table 1, we list the number of enterprises from the region that participated in the survey whose results we discuss below.

As noted above, sub-federal governments have taken very different approaches to the privatization of industrial land on their territory. What might account for this variation? If public officials view control rights over land as a means to access a stream of rents, we might expect the resistance to federal efforts to unifying ownership rights over enter-

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<sup>8</sup> The website with the comprehensive regional data was at [http://www.kadastr.ru/available\\_land\\_2008/](http://www.kadastr.ru/available_land_2008/). After *Roskadastr* was subsumed by *Rosreestr*, the website was no longer available.

<sup>9</sup> Formally, *Roskadastr*'s designation encompasses "lands for residential and commercial structures as well lands for industry, transport and communications" (*земли жилой, общественно-деловой застройки, земли промышленности и общего пользования, а также транспорта, связи и инженерных коммуникаций, земли иного специального назначения*).

<sup>10</sup> Within the Russian capital, after all, a good amount of land is given over to parks and largely un-developed green spaces; within the city limits of St. Petersburg, roughly 20,000 hectares is designated as arable agricultural land.

prise land and capital to have been resisted most where the potential rents from public land ownership are greatest – *i.e.*, where land is most valuable.

In the absence of a well-developed land market that provides reliable price information, we must engage in a bit of reasoned speculation as to the factors that explain differences in land values across regions. We could reasonably expect, for instance, that they relate to urbanization and development. Proximity to more amenities and market opportunities, that is, make urban real estate generally more valuable than land outside of cities. In a related manner, higher regional per capita income should be associated with higher land values by increasing demand for urban retail space and housing. We might thus expect regional urbanization rates and higher per capita income to increase the economic cost, in terms of foregone rents, to public officials of relinquishing control rights over land.

There may be political costs to consider as well. Inhibiting the privatization of industrial land will be more of a risk for officials in regions in which the industrial sector is relatively large and in which the politicians are particularly sensitive to social demands. We might thus anticipate finding more privatization where industry and construction represent a larger share of regional output and where the local political process is more transparent and democratic.

We would expect our index of urban industrial land privatization to be higher in those regions in which the political and economic costs to divesting control are low. We observe in Figures 5a that our urban industrial land privatization index was strongly and inversely related to measures of regional per capita income in 1995. Figure 5b, however, suggests that there does not appear to be the hypothesized negative relationship between the urbanization rate and industrial land privatization. Instead, when not controlling for other factors, the relationship is weakly positive. Figure 5c demonstrates the anticipated positive relationship between the index of urban industrial land privatization and the share of regional output produced by industry and construction. And finally, Figure 5d highlights a strong relationship between a well-known regional democracy index and industrial land privatization.

In Table 2, we present regression results from a simple OLS model in which we simultaneously control for these different variables. We take regional data on per capita

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<sup>11</sup> Within the Central District alone, the urban industrial land privatization index ranged from 0.2% in the city of Moscow to 24.2% in Belgorod.

income and urbanization from 1995, a year after a Presidential Decree first called for enterprise land to be included in the general privatization program. In the absence of data on regional industrial structure from 1995, we use the percentage of regional output accounted for by industry and construction in 2000 under an assumption that this ratio would be relatively sticky across time. Finally, we enter separately three well-known measures of regional political variation. Data on transparency of the regional government are from “Media-Soyuz,” an independent association of Russian journalists (Akhmedov and Zhuravskaya, 2004); a variable capturing the scope of regional democracy comes from the Carnegie Center Moscow (Petrov, 2001); finally, an alternate measure of regional democracy comes from Zubov ([http://atlas.socpol.ru/indexes/index\\_democr.shtml](http://atlas.socpol.ru/indexes/index_democr.shtml)).

The results conform closely to expectations. When controlling for other regional variables, the urbanization rate is no longer positively related to the privatization of industrial land; indeed, in two of the specifications, the relationship is both negative and statistically significant. Gross regional product per capita is inversely related to the land privatization index at the 1% level across all three specifications. The share of regional output contributed by the industrial and construction sectors has the predicted relationship to the rate of industrial land privatization; again, the result is significant at the 1% level in all three specifications. Finally, our various measures of political openness are all positively correlated with land privatization. In sum, our findings support the theory that privatization should have proceeded most quickly in those regions where we would expect to observe lower economic and political costs to divest their control rights over urban industrial land.

## 4 A micro-level perspective on plot tenure status

### 4.1 Survey of large, urban, industrial firms

Prior research has shown that despite a uniform federal policy, regions have differed greatly with respect to how accommodating they have been of firms’ attempts to privatize their plots. Regional officials have effectively been able to manipulate the “price” for privatizing a hectare of urban land. When they have been given the discretion, they have done so explicitly and directly (Kisunko and Coolidge, 2007). At other times, when their policy autonomy has been more circumscribed, some tinkered with the price indirectly by rather

capriciously raising the cadastral values that serve as the basis for a plot's price (Khakhalin and Pyle, 2009). They also have been able to raise prices implicitly by putting various bureaucratic obstacles in the way of firms. Regardless of the mechanisms used, the regional variation in the price – a function of the structural and political factors highlighted above and captured as the inverse of our industrial land privatization index – can be seen as exogenous to the decisions of individual firms. Each firm, that is, takes regional policy as given and pursues its interest with respect to land tenure status accordingly. In regions where the land index is high, firms confront a low price for privatizing land; and *vice versa*. A firm's choice to privatize its plot should reflect this "regional price." But we would presume that it will also reflect firm and plot-specific characteristics.

To understand the determinants of land privatization at the firm level, we collaborated with Moscow's Levada Centre to design and administer a survey of 359 large, urban industrial enterprises in the fall of 2009.<sup>12</sup> Just under one fifth of the firms were in either Moscow or St. Petersburg, Russia's two largest cities. The rest were distributed relatively equally across cities (each a capital of a territorial subject) of three different size ranges: 1 to 3 million; .5 million to 1 million; and .25 to .5 million. In all, the respondents represented 53 cities and territorial subjects; 153 firms were located in the "progressive" regions noted in Table 1 (see column five).

Respondents answered general questions regarding their firm as well as those specifically addressing land-related issues. A series of questions addressed the firm's primary production plot, with separate blocks designed for plots of different tenure status – *i.e.*, private, leased, or permanent (perpetual) use. Another series of questions asked about up to three additional plots attached to the firm at the time of the survey. One more block focused on plots that had been seized or sold in the recent past. Finally, respondents answered a series of questions regarding the development of the land market in their regions.

Of survey respondents, 172 own their primary production plot; 131 lease and 56 hold it in perpetual use rights. Table 3 presents characteristics of the various enterprises and their primary production plots by land tenure status. Before highlighting differences, it is worth highlighting similarities across plots of different tenure status. First, a high per-

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<sup>12</sup> Pilot surveys were administered in the summer of 2009. Of those firms contacted to participate in the survey, 429 refused categorically; 308 did not refuse outright but did not end up participating for one reason or another (*e.g.*, the surveying organization had some difficulty in settling on a mutually convenient time); at 42 firms, the necessary respondent was absent (*e.g.*, due to illness or vacation); finally, 458 did not complete the



centage had office buildings on them, whereas social infrastructure (*e.g.*, apartments, medical centers and educational facilities) and commercial space (*e.g.*, stores and markets) were less common, although by no means rare.<sup>13</sup> At the time of the enterprises' privatization, roughly 80 percent of the plots were attached to the enterprise; the others were acquired after the firm's privatization. Finally, firms in all three groups experienced, on average, significant employment declines since having been privatized.

Several differences strike us as noteworthy. Firms whose plot did not include social infrastructure (*e.g.*, apartments, medical centers and educational facilities) at the time at which they were privatized were less likely to have privatized their land and more likely to still hold it under perpetual use rights. Firms that continue to operate under Soviet era land tenure rules were more likely to have much larger plots. Moscow is a clear outlier with respect to land tenure; relative to firms elsewhere, those in the capital were more likely to lease their land and less likely to hold it privately or under perpetual use rights. Finally, the ownership profile of firms varies across land tenure status. For instance, foreigners seem to play a relatively small role and the labor collective a relatively large role in firms that hold their plots under perpetual use rights.

As per our earlier discussion, we find that most enterprise privatizations pre-dated privatization of their primary production plot by a number of years. Figure 6 lays out how most of the surveyed enterprises that owned their plots at the time of the survey were privatized by 1994, whereas most of their plots were privatized after 2001. The median time period between the two privatizations was six years. A similar relationship emerges if we restrict our observation to those plots that were attached to the enterprise at the time of its privatization.

Among the private plots, two-thirds were held in perpetual use prior to privatization, with the remainder having been leased. The transition from lease-holding to private

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survey because they did not make it through the filtering questions that related to their sector, ownership status, year of privatization and/or employment size.

<sup>13</sup> In the early 1990s, all firms over 10,000 employees offered housing as did roughly one-third of those with less than 500 employees. Further, some 70% of large and medium-sized enterprises offered medical services while over half provided day care. Many of these services were available to local residents and not just enterprise employees. Responding to a push from federal legislation, many of these social assets were taken over by municipalities in the mid-1990s. The average firm in a survey of several hundred large industrial enterprises had by 2003 divested 75% of its housing and 86% of its day care capacity (Juurikkala and Lazareva, 2006).

ownership became more common after 2001.<sup>14</sup> To purchase the plots, 67 (46.2%) paid a percentage of cadastral value to purchase the plot (an average rate of 5.6%, median response of 2.5%); 41 (28.3%) paid the full cadastral value; and 20 (13.8%) paid a factor of 3 to 30 greater than the land tax (an average factor of 9, median of 5.5); four had “other” arrangements; and the rest did not answer.<sup>15</sup>

## 4.2 The determinants of plot tenure status

Inter-enterprise variation in land tenure should reflect the influence of sub-federal policy and the tenure status demanded by individual firms. The index that we introduced above proxies for the price variation of privatizing plots across different regions. We would thus expect it to explain tenure status of responding firms even after controlling for enterprise and plot-specific characteristics. Conditional on a given orientation of regional land policy, however, certain plot and enterprise characteristics may increase or decrease interest in owning its own plot.

Market liberalization rendered worthless much of the capital inherited from the bloated Soviet industrial sector, forcing enterprises to reduce (or discontinue) production and (eventually) shed workers. For many, particularly those in densely populated urban centers, buildings and land constituted their most valuable assets in the new environment. Many (nominal) industrial enterprises, have survived by exploiting their location as well the presence of structures that could be quickly converted to alternative uses.<sup>16</sup> In St. Petersburg, a large optics manufacturer that had employed 20,000 in Soviet times, drastically reduced its workforce and in 2008 reported rental income of 20 million dollars from various inherited properties.<sup>17</sup> According to one account, there were roughly 350 production facilities in central Moscow that in 2004 were “obsolete and absolutely unprofitable ... [but] many of them [were] being leased out as offices or warehouses ... (Maternovsky,

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<sup>14</sup> The pre-privatization plot owners were distributed as follows: federal government 24.7%, regional government 16.5% and municipality 26.6%; the remainder, 32.3%, had not yet been assigned to a specific level of government.

<sup>15</sup> A substantial majority of firms that own their plots report paying a 1.5% land tax rate; 28 pay less, with the low being 0.4%. The average of all firms that report a specific rate is 1.4%.

<sup>16</sup> Land re-development costs for light industrial firms, particularly environmental clean-up, are low relative to other industrial sectors. Generally, the biggest costs associated with brownfield development are related to infrastructure and utilities needed to support commercial and residential uses (Humphries, 2006).

2004).” By another estimate, 40 percent of class B office space in Moscow is located on the premises of former industrial enterprises (Egorova, 2006). Since the costs of converting office space are lower than that for former shops and industrial space (Egorova, 2006), we would expect that industrial firms that inherited office buildings on their production plots would be more likely to have privatized their land so as to better secure control over the rents that those assets can generate.<sup>18</sup>

Conversely, we would expect that the presence of social assets on a plot may discourage privatization. A comprehensive survey of large industrial enterprises found that housing, medical and daycare facilities have been a “financial burden” to firms (Juurikkala and Lazareva, 2006). In 2003, fewer than 5% of general managers per social asset described them as profitable; and the majority of firms that still held housing assets wanted to divest them.<sup>19</sup>

These sorts of stories suggest that the decision to privatize land plots may relate to whether various real estate inheritances represent potential assets or liabilities. To the extent that office buildings represent future revenue streams, conditional on region-level policy, we might expect their presence to be associated with plot privatization as a means of better securing the potential rents that they represent.<sup>20</sup> Similarly, to the extent that social assets represent a negative flow of rents into the future, we might expect that enterprises would be less likely to privatize their plot if more secure land rights translate into greater responsibility for the maintenance of costly infrastructure and services.

To explore the micro-level determinants of plot privatization more carefully, we employ a regression framework, testing the following specification, to investigate the determinants of the land tenure status of the firm’s primary production plot:

$$T_i = \alpha + \varphi P_i + \gamma E_i + \zeta R_i + \varepsilon_i \quad (1)$$

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<sup>17</sup> From [www.lomo.ru](http://www.lomo.ru) and author interview with Marina Zvereva, Deputy General Director of LOMO in January 2009.

<sup>18</sup> Until April 2006, Moscow factories benefitted from favorable rental rates charged by the mayor’s office; they then could generate rents by sub-leasing at higher prices. The willingness of the Moscow government to subsidize some rents gave it a great deal of leverage over enterprises. For instance, the Krasnopresnenky Sugar Factory was penalized for “unauthorized use of the land” and saw its rent increased by a factor of ten (Gerasimova and Lobanova, 2006).

<sup>19</sup> Many managers, however, reported that relations with local officials would worsen should they divest.

<sup>20</sup> The conservative (and, some would say, corrupt) policies of the Luzhkov administration in Moscow made it almost impossible to take private ownership of land. Firms there have thus been unable to use land privatization to better secure property rents. As the evidence suggests, however, the policies have not made it impossible for firms to use their real estate to generate revenue.

The dependent variable  $T_i$  represents the tenure status of the  $i^{th}$  firm's primary production plot. In our baseline probit model, it takes on the value of one (zero otherwise) if the land is owned privately at the time of the survey. In subsequent models it takes on the value of one if the plot was privatized before 2002, after 2002 or if the plot is still held under permanent (perpetual) use rights.<sup>21</sup>

$P_i$  represents a vector of plot-specific characteristics, including the log of the plot's size (in hectares) and three dummy variables for the presence of different types of real estate assets located on it at the time when the enterprise was first privatized: office buildings, objects of social infrastructure (*e.g.*, apartments, medical centers and educational facilities) and commercial space (*e.g.*, stores, markets or exhibit halls). As we discussed above, we would expect the presence of office buildings to be positively related to plot privatization, whereas the presence of social assets should be inversely related.

$P_i$  also includes a dummy variable for the plot's location on the edge (as opposed to the interior) of the city. We might reasonably expect this location variable to be related to plot privatization. Since rents from plots proximate to the city center should be greater, we would expect location on the urban periphery to be inversely related to private ownership. Another variable captures whether the plot is near at least two other enterprises. Additional plot-specific include binary variables that address characteristics of the plot at the time of the enterprise's privatization: was it attached to the enterprise at the time (as opposed to being acquired later)?; was it the only such plot (as opposed to being one of multiple) attached to the enterprise?; and was it used at full capacity?

$E_i$  represents a vector of additional characteristics of the enterprise that are not directly related to its primary production plot. These include (the log of) the number of full-time employees at the time of privatization, dummy variables for whether or not it is a member of a commercial group (*e.g.*, a financial-industrial group, holding structure, *etc.*) and/or government corporation and categorical variables capturing the influence of various types of owners (*e.g.*, foreigners, managers, non-managerial workers) on the enterprise's strategic decisions.

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<sup>21</sup> For the plot-privatized-before-2002 specification, we restrict observations to firms whose capital had been privatized prior to that date since land privatization could not precede capital privatization. In the plot-privatized-after-2002 specification, we exclude observations whose plot had been privatized before that date.

Finally, we control for regional characteristics,  $R_i$ , most notably our proxy for regional land policy measured as the ratio of urban residential-commercial land owned by firms to that owned by the government and municipalities.<sup>22</sup>

Table 4 lays out our results.<sup>23</sup> Notably, our proxy for the region-specific (inverse) “price” of privatization – the ratio of urban commercial-residential-industrial land held by private firms to that held by the state and municipalities – is strongly associated with the private ownership of land at the individual firm level. Where land policy has been more progressive at the regional level, firms, as we would expect, have been more likely to privatize their plots conditional on a large number of plot and enterprise characteristics. This result is statistically significant at the 1% level and is robust to the timing of plot privatization, explaining it before 2002 – *i.e.*, concurrent to or before the passage of the Land Code – as well as after.

We also find that land tenure status is strongly associated with the presence on the plot of specific types of real estate objects at the time of enterprise privatization. Firms with social infrastructure on their premises (medical centers, apartment buildings or educational facilities) were 20 percentage points less likely to have privatized their land by the time of the survey. On the other hand, privatized firms that inherited office buildings were almost 17 percentage points more likely to have privatized their lands by the time of the survey. These results were both highly sensitive to the timing of plot privatization. The presence of office buildings robustly explains privatization of land prior to but not after 2002; and the presence of social infrastructure is a significant determinant of land privatization after 2002 but not before. The former might be understood in terms of expected rents. Early on, the severely constrained supply of urban office space for new businesses elevated potential gains from securing ownership over land and real estate estates. As supply increased – as other enterprises leased out their office buildings and new office space came on line – the expected rents from securing ownership of land and real estate assets diminished.

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<sup>22</sup> We also include controls for the city size in which the firm is located and whether or not it is in St. Petersburg, one of the two cities that constitute territorial subjects unto themselves. We exclude a control for Moscow location because it perfectly predicts non-private tenure status. The city population variable takes on the value of 1-5: 5 for greater than 3 million; 4 for 1-3 million, *etc.*

<sup>23</sup> A number of observations are dropped because of lower response rates on two questions: the area of the plot and employment at the time of privatization. In specifications that drop the former and include the employment for 2007, the results look quite similar.

Several firm characteristics are strongly correlated with perpetual use rights over the primary production plot. Firms at which foreigners have a greater voice are less likely to be holding their land under the this status; but firms at which non-insider Russians exercise more influence are more likely to operate under the old Soviet form of tenure. We also observe an association between perpetual use rights and lands categorized as the most environmentally hazardous. But, in general, most other plot and enterprise characteristics are quiet in terms of explaining land tenure status at the time of the survey.

A number of additional enterprise characteristics, however, are related to the timing of plot privatization. Those occurring prior to 2002 were associated positively with the plot being used at capacity, as well as being “on the firm’s balance” at the time of its (the firm’s) privatization. Plots that were the only one held by the firm at the time of the privatization were 12 percentage points more likely to have been privatized by 2002.

## 5 Motivation for and barriers to land privatization: testing assumptions

The survey allows us to explore in more depth the assumptions underlying the foregoing analysis. Our discussion to this point, for one, has taken for granted that, given a choice, firms acquire legal ownership over their land so as to increase the strength of their property rights. On this basis, we explored the relationship between tenure status and the presence of contiguous assets capable of generating rents. But in an environment in which state commitment to the rule of law is often open to question, the value of formal title may be negligible in terms of the security of property rights. To address this question head on, respondents at enterprises that had privatized their plots were asked the importance of a number of possible motives. Table 5 lays them out in order of popularity according to the percentage of respondents describing a motive as extremely important (*i.e.*, a 5 on a 1-5 scale). Responses are grouped according to whether or not the plot was privatized before or after the passage of the 2001 Land Code.

The most frequently cited motive, irrespective of timing, was the promise of more secure property rights (*обеспечит большую защищенность бизнеса*). Half of those whose plots were privatized before the Land Code’s passage and 71 percent that were privatized after cited it as an important rationale. Presumably also related to the security of

property rights, the two next most popular responses relate to attracting financial support. Over half of firms that privatized their plots after 2002 cited access to external lending and increased attractiveness of the property to investors as important reasons for purchasing their plots. Although these motives were also relatively important in the context of pre-2002 privatizations, their significance during this period, when financial markets were less well-developed, was not as great. We interpret these responses as suggesting that legal title to land is indeed valued for the security of property rights that it confers. Whether to increase the confidence of either creditors as to the potential value of pledged collateral or of owners and potential investors as to the reduced likelihood of government predation, increased security of property rights appears to be central to the firm's decision to assume formal ownership over contiguous land.

A second important assumption above was that our land index did indeed represent the actual inter-regional policy variation that we described. Of course, the fact that we found that surveyed firms were less likely to have taken ownership over their primary production plot in regions where the index ("price") of urban industrial land privatization was low (high), even after controlling for a number of firm and plot-specific characteristics, gives us confidence that the index captures what we have argued it does. But we can explore this assumption further by looking at survey responses concerning the obstacles confronted by firms that had privatized their plots. In the bottom of Table 5, we observe that the most frequently mentioned obstacles included opaque regulations governing land purchases and direct government opposition. Others, such as a lack of the requisite financial resources, did not figure as prominently.

In Table 6, we explore the factors that influence how significant a barrier firms considered opaque regulations and outright government opposition. Controlling for the same firm and plot characteristics that we did in earlier models, as well as for other perceived barriers, we see that firms located in regions where the index of land privatization was high, firms were less likely to characterize opaque regulations and government opposition as a more important barrier to plot privatization.<sup>24</sup> Since outright resistance and unclear guidelines are two means that sub-federal officials have been known to use to thwart

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<sup>24</sup> We control for the sum of the firm's responses to the other "barrier" questions so as to diminish the likelihood that results are driven by unobserved variation in firms' willingness to respond with systematically higher or lower responses across all barriers. For instance in the government-opposition model, we control for the sum of each of the eight other responses; since respondents rank each barrier on a scale of importance

the privatization of plots (*i.e.*, to raise the effective price of private ownership), we have even more reason to have confidence that our urban industrial land privatization index is measuring policy variation across space in Russia.

Table 6 also highlights some interesting firm characteristics related to having reported greater government-related difficulties in the process of plot privatization. For one, ownership structure seems to matter for the degree of official opposition encountered. Perhaps unsurprisingly, firms with foreign owners were more apt to report government opposition. Those belonging to a government corporation, however, were less likely to meet this sort of resistance. Finally, firms whose plots had been categorized as environmentally hazardous were less likely to report government opposition as problematic. It may well be the case that the clean-up required by heavily polluted plots leaves government officials more than happy to relinquish ownership.

## 6 Conclusion

Our interest in the tenure status of urban industrial land ultimately derives from an interest in the potential effects of formal changes in ownership. Do enterprises that own their plots behave differently than those that do not? Are they more likely to invest at greater rates? Do they have more success in accessing external finance? Are they more apt to sell or lease their lands for new purposes and thus promote urban de-industrialization and the adoption of land use patterns more typical of modern global cities?

These are all interesting and important questions that, we trust, readers will recognize as not having been adequately explored by researchers. But before they can be adequately answered, it is important to explore the determinants of the surprising variation in plot tenure status across firms, cities and regions. To do so, we suggested these differences have arisen from decisions made at two levels. First, sub-federal officials have decided how quickly and thoroughly to respond to federal privatization initiatives, most notably the 2001 Land Code. We tested and found support for the hypothesis that they would be most reluctant to give up control rights over land when the economic and political costs to doing

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from 1 to 5, this variable can take on a value from 8 to 40. A control was also included for whether or not the plot was privatized before or after 2002.

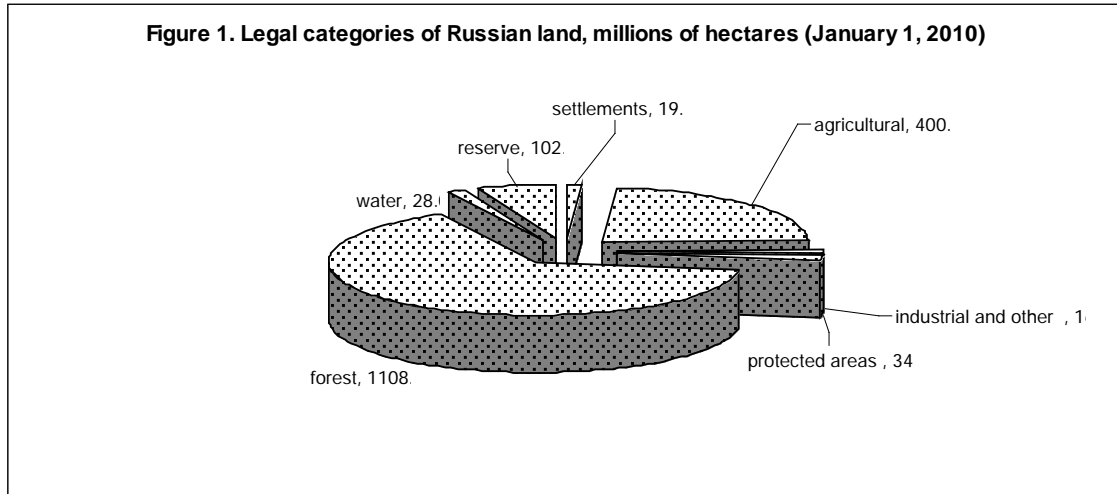


so would be the greatest. Indeed where land values are likely the greatest – and thus the opportunity to extract rents are more abundant – privatization has proceeded the slowest. We also observe slower rates of privatization where the political costs to regional officials of not divesting control rights are relatively low – *i.e.*, where politics are either less likely to be dominated by industrial interests, or are less democratic.

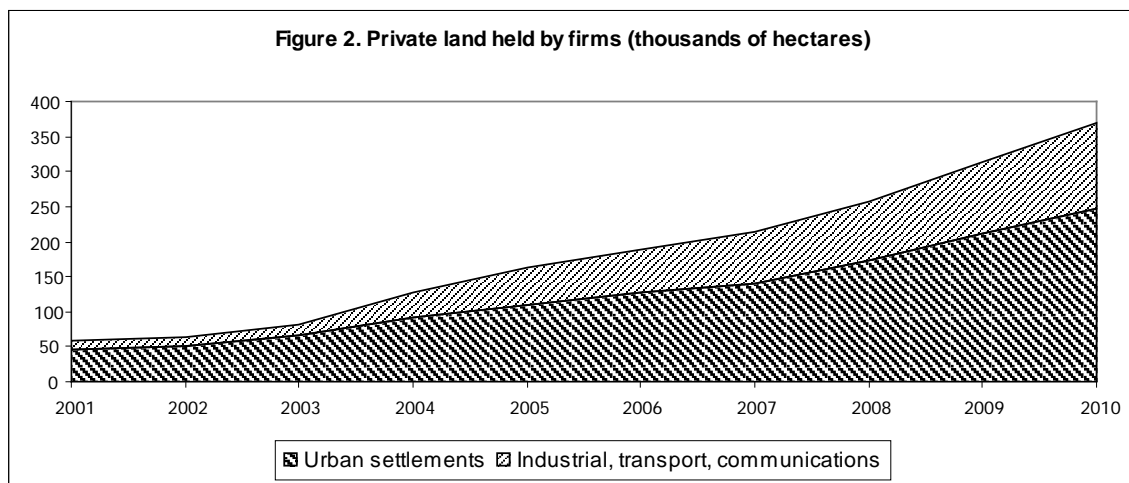
Second, taking regional policy as given, firms' owners and managers then decide whether or not to privatize their plots. Where this exogenous "price" has been set high, firms are less likely to "purchase" title of the land, all else equal. But not all firms are equal. We hypothesized that firms would be more likely to privatize if their inherited assets could generate a stream of positive rents and would be less likely to assume ownership if it increased the responsibility for costly inherited assets. We found support for these hypotheses as well. Firms that inherited office buildings that could be leased out or sold to an expanding service sector were more likely to have purchased their plots. Those with social assets, which prior research has demonstrated as being a financial burden, have been less willing to assume ownership of their land.

Our evidence is consistent, in other words, with the proposition that both regional officials and industrial firms have made decisions that are sensitive to the magnitude of land rents. In regions where we have reason to believe these rents are greater, policies to slow the progress of state divestment appear to have taken root. Controlling for regional policy, managers and owners of private industrial firms have been most likely to secure their rights to these rents if their inherited real estate assets seem to offer lucrative opportunities in the new environment.

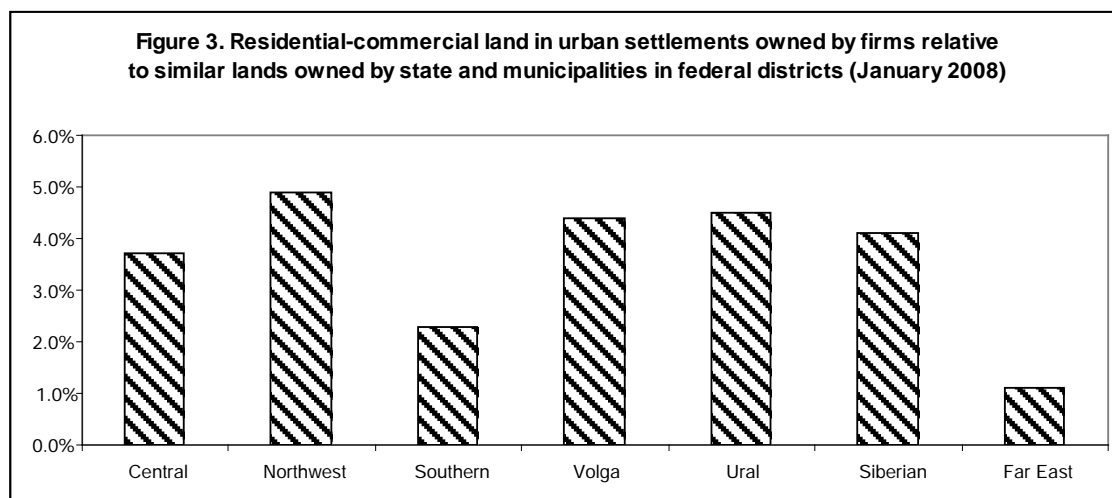
## Figures



Data source: Gosudarsvennyi doklad o sostoianii i ispol'zovanii zemel' v rossiiskoi federatsii v 2009 godu.



Data source: Gosudarsvennyi doklad o sostoianii i ispol'zovanii zemel' v rossiiskoi federatsii; multiple years.



Data source: [http://www.kadastr.ru/available\\_land\\_2008/](http://www.kadastr.ru/available_land_2008/).

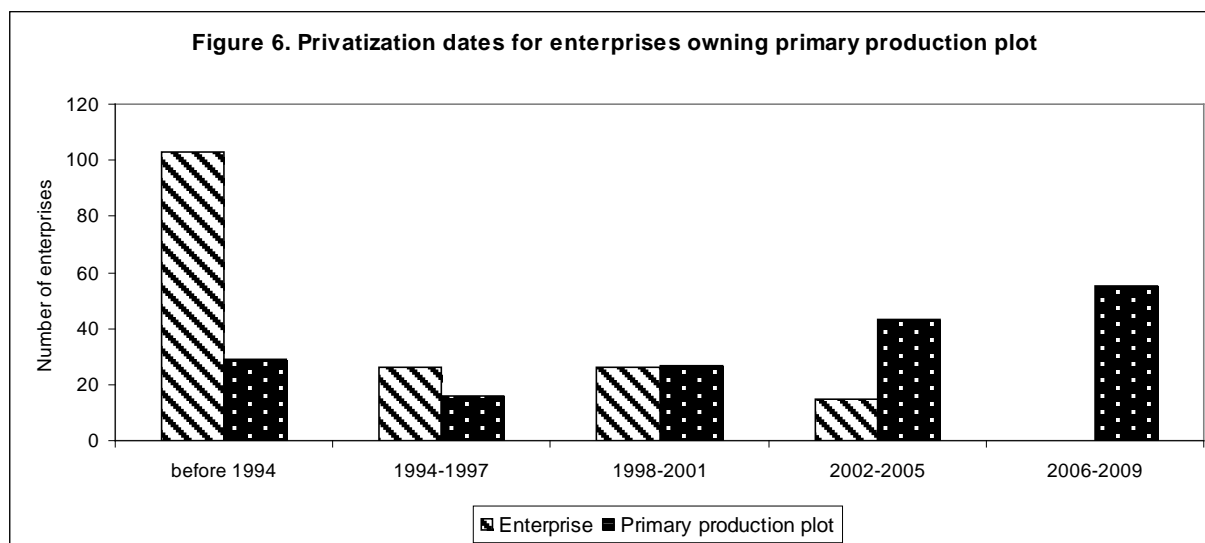
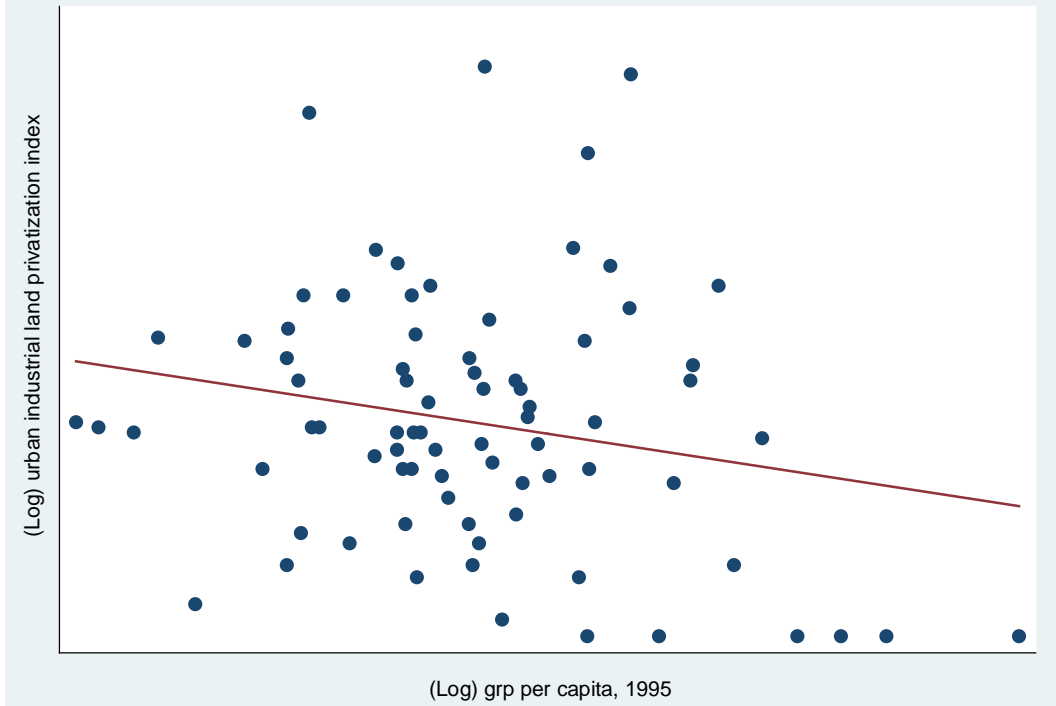
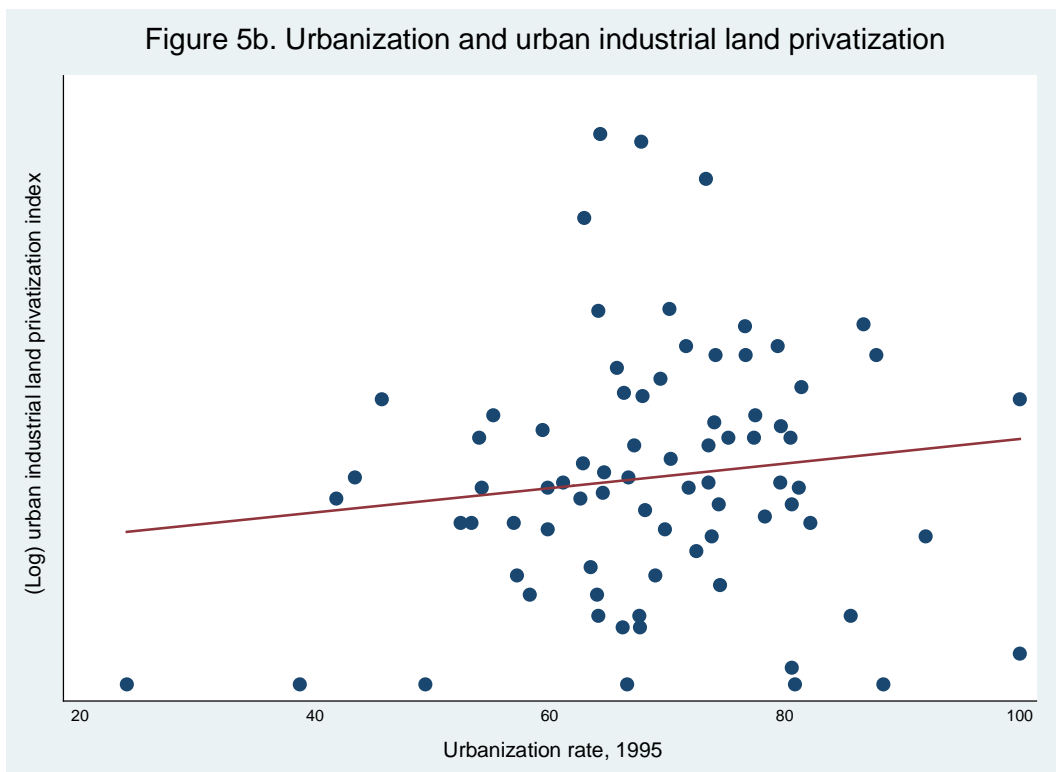


Figure 5a. Gross regional output per capita and urban industrial land privatization



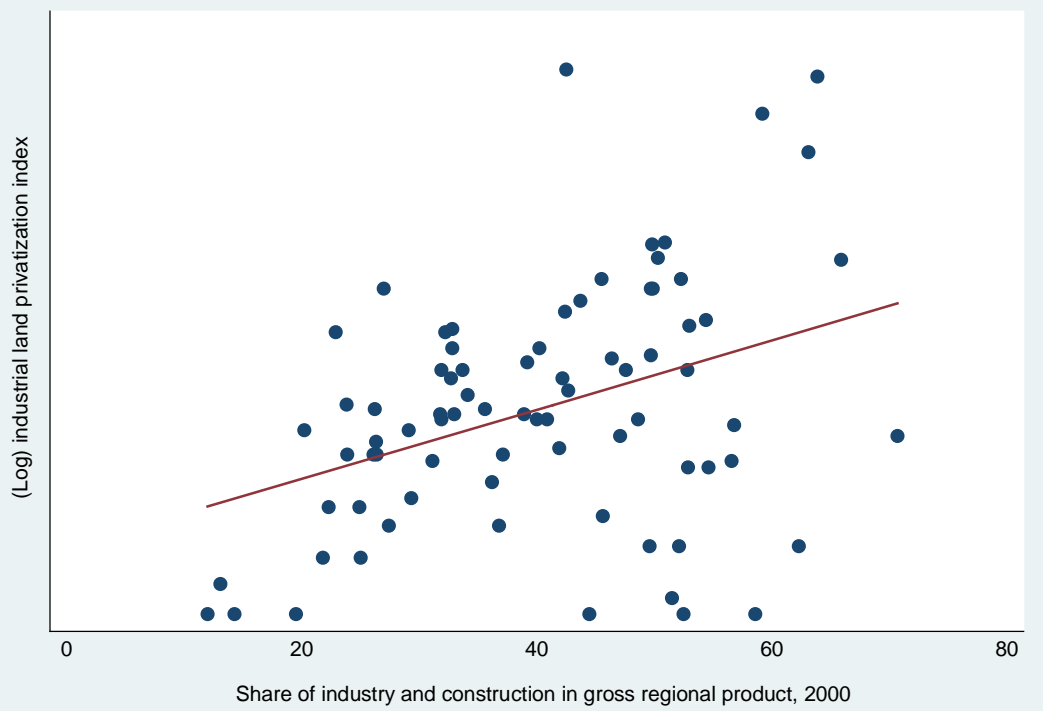
Data sources: [http://www.kadastr.ru/available\\_land\\_2008/](http://www.kadastr.ru/available_land_2008/). Regiony Rossii, Goskomtat

Figure 5b. Urbanization and urban industrial land privatization



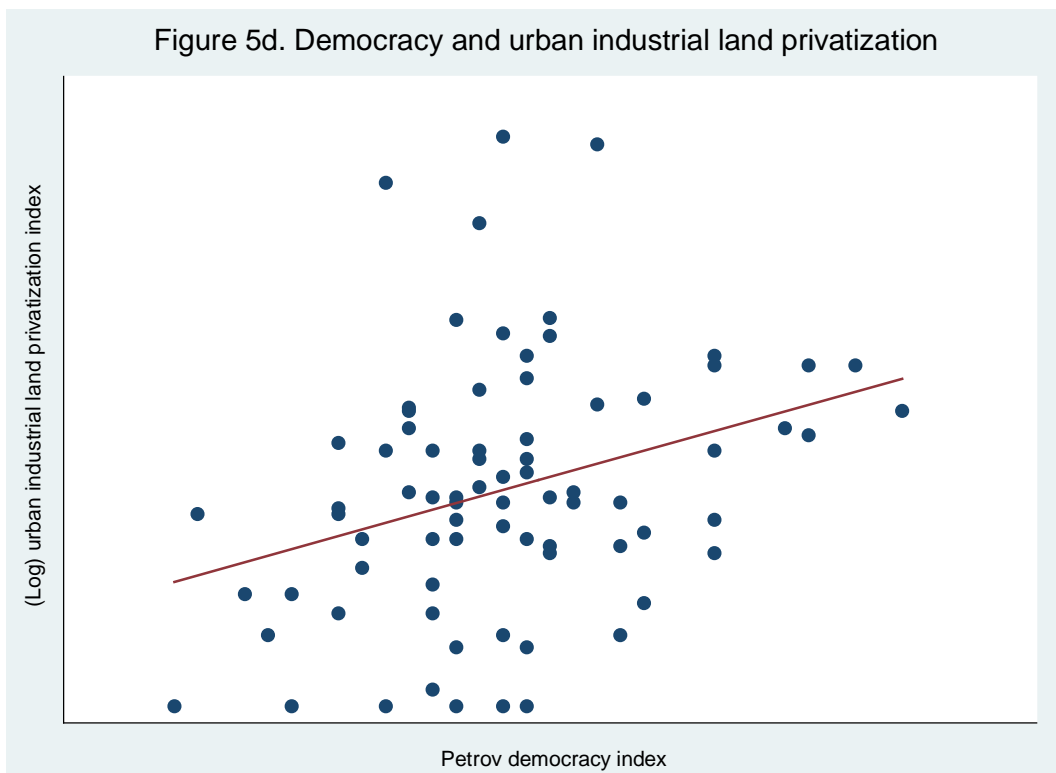
Data sources: [http://www.kadastr.ru/available\\_land\\_2008/](http://www.kadastr.ru/available_land_2008/). Regiony Rossii, Goskomtat

Figure 5c. Regional output structure and urban industrial land privatization



Data sources: [http://www.kadastr.ru/available\\_land\\_2008/](http://www.kadastr.ru/available_land_2008/). Regiony Rossii, Goskomtat

Figure 5d. Democracy and urban industrial land privatization



Data sources: [http://www.kadastr.ru/available\\_land\\_2008/](http://www.kadastr.ru/available_land_2008/). Regiony Rossii, Goskomtat

## Tables

Table 1 Land owned by firms in "progressive" regions

	Commercial-residential-ind land in urban settle- ments			Amount of industrial land outside of settlements owned by firms relative to amount owned by state (%)	Number of survey res- pondents
	Amount owned by firms relative to amount owned by state and munic- ipalities (%)	Owned by firms (1000 hec- tares)	Owned by state and municipali- ties (1000 hec- tares)		
Belgorord	24.9	6.7	26.9	44.1	6
Vologoda	23.8	4.9	20.6	9.4	--
Tatarstan	18.9	10.4	54.9	116.3	15
Lipetsk	14.8	3.4	22.9	7.3	10
Novgorod	8.2	1.5	18.2	5.0	4
Orenburg	8.1	4.2	52	4.5	--
Kemerovo	7.4	8.3	111.7	8.6	5
Tyumen	7.3	2.1	28.8	5.1	3
Khakasiia	6.4	1.1	17.3	0.0	--
Irkutsk	6.4	5.8	91.2	6.8	6
Perm	6.0	4.1	68.9	9.3	13
Sverdlovsk	6.0	8.9	149.3	14.7	17
Novosibirsk	6.0	3.1	51.6	1.2	3
Tomsk	5.5	0.9	16.3	11.1	8
Smolensk	5.1	1.2	23.5	20.6	7
Cheliabinsk	4.8	4.9	102.7	0.4	17
Leningrad	4.6	1.6	34.5	4.9	--
Rostov	4.5	3.6	80.2	10.1	10
St. Petersburg	4.4	2.8	63.4	--	24
Kareliia	3.7	0.6	16.1	3.4	2
RSFSR	3.7	116.4	3133.0	4.4	359

Data source: [http://www.kadastr.ru/available\\_land\\_2008/](http://www.kadastr.ru/available_land_2008/)

Table 2 (Log) urban commercial-residential-industrial land owned by firms relative to that owned by municipalities and government

(Log) gross regional product per capita, 1995	-0.244*** (0.091)	-0.272*** (0.099)	-0.268*** (0.098)
Percentage of population living in cities, 1995	-0.014** (0.007)	-0.012 (0.009)	-0.014* (0.007)
Share of regional domestic product from industry and construction, 2000	0.023*** (0.008)	0.024*** (0.008)	0.025*** (0.007)
Transparency (Media-Soyuz)	0.292*** (0.101)		
Democracy (Petrov)		0.031** (0.014)	
Democracy (Zubov)			0.032** (0.014)
N	78	77	78
Pseudo R2	0.3400	0.2724	0,2894

OLS with robust standard errors in parentheses. \*\*\*, \*\*, \* significant at 1%, 5% or 10% levels, respectively.

Table 3 Characteristics of enterprise and primary production plot by land tenure status

	Private	Lease	Perpetual use	
Assets on plot when enterprise privatized (or when land acquired for use)				
Office buildings	89.5	87.1	87.5	
Social infrastructure	33.7 **	42.0	53.6	**
Stores, markets or exhibit halls	20.3	12.2 **	23.2	
Characteristics of plot				
Number of hectares	35.1	39.9	344.5	**
Only plot "on balance" of enterprise when enterprise privatized (%)	40.1	35.1	25.0	*
"On balance" of enterprise when enterprise privatized (%)	82.0	78.6	76.8	
Used at full capacity when enterprise privatized (%)	80.7	86.2	80.4	
First category of environmental harm (%)	4.7	6.1	3.6	
Location of plot				
Edge of city	44.2	51.1	53.6	
More than two other enterprises in same part of city	62.8	72.5 *	64.3	
Moscow	1.2 ***	33.6 *	3.6	**
St. Petersburg	7.0	7.6	3.6	
City size (1-5 scale)	3.0 ***	3.8 *	3.0	*
Enterprise characteristics				
Employees at time enterprise was privatized	2209.	2199.		
	8	9	3156.8	*
Employees in 2007	1430.	1554.		
	0	1	1981.5	
Employees in 2009 (time of survey)	1248.	1368.		
	2	5	1588.6	
Years since enterprise was privatized	14.3	14.9	14.4	
Member of commercial group (FIG, holding, etc.) (%)	30.4	34.3	25.0	
Member of government corporation (%)	5.2	3.1	12.5	**
Influence of state property fund (0-4 scale)	0.35	0.35	0.53	
Influence of non-management labor (0-4 scale)	1.35	1.14	1.32	**
Influence of foreigners (0-4 scale)	0.45	0.64 **	0.11	**
Influence of management (0-4 scale)	2.36 ***	1.78 **	1.91	*
Influence of other Russian individuals (0-4 scale)	1.47	1.01 **	1.82	**
Influence of other Russian enterprises (0-4 scale)	1.17 **	1.56 **	1.41	*
Number of respondents	172	131	56	

\*\*\*, \*\*, \* difference significant at 1%, 5% or 10% levels, respectively; t-test on equality of means of those inside and outside sub-group.



Table 4 Tenure status at primary production plot

	Privatized			Perpetual use
	At time of survey	Before 2002 <sup>+</sup>	2002 or after <sup>++</sup>	
(Log) urban commercial-residential-industrial land owned by juridical relative to that owned by municipalities and government	0.305*** (0.078)	0.139*** (0.035)	0.215*** (0.070)	-0.057 (0.035)
Plot's assets when enterprise privatized (or when land acquired)				
Office buildings	0.168* (0.090)	0.121*** (0.032)	0.096 (0.091)	-0.037 (0.068)
Social infrastructure	-0.206*** (0.064)	-0.017 (0.047)	-0.211*** (0.070)	0.074* (0.039)
Stores, markets or exhibit halls	0.102 (0.083)	-0.068 (0.048)	0.151 (0.099)	0.004 (0.047)
Other plot characteristics				
Only one "on balance" of enterprise when enterprise privatized	0.059 (0.062)	0.120** (0.051)	-0.012 (0.068)	-0.017 (0.041)
"On balance" of enterprise when enterprise privatized	0.072 (0.086)	0.093** (0.044)	-0.041 (0.073)	-0.060 (0.055)
Used at full capacity when enterprise privatized	-0.006 (0.078)	0.086** (0.042)	-0.067 (0.092)	-0.040 (0.048)
Located on edge of city	-0.068 (0.083)	-0.028 (0.050)	-0.023 (0.086)	0.042 (0.039)
More than two other enterprises in same part of city	-0.046 (0.071)	0.035 (0.048)	-0.095 (0.061)	-0.047 (0.038)
Class I harm category	0.050 (0.181)	0.082 (0.131)	0.008 (0.192)	-0.096*** (0.024)
(Log) number of hectares	-0.002 (0.029)	-0.023 (0.023)	0.001 (0.031)	0.010 (0.015)
Other enterprise characteristics				
(Log) employees at time of enterprise's privatization	-0.025 (0.039)	0.008 (0.025)	0.005 (0.042)	0.031 (0.021)
(Log) years since privatized	0.119 (0.116)	0.375*** (0.133)	0.106 (0.136)	-0.076 (0.049)
Member of government corporation	0.130 (0.145)	-0.098** (0.043)	0.241 (0.177)	0.049 (0.094)
Member of commercial group	0.069 (0.086)	0.065 (0.050)	0.030 (0.087)	-0.043 (0.037)
Influence of government property fund	0.007 (0.033)	0.069*** (0.018)	-0.061 (0.046)	0.019 (0.020)
Influence of foreigners	0.020 (0.028)	-0.003 (0.023)	0.009 (0.026)	-0.086*** (0.022)
Influence of external Russian individuals	0.003 (0.025)	0.018 (0.016)	-0.010 (0.022)	0.036*** (0.013)
N	285	266	221	285
Pseudo R2	0.1901	0.2573	0.1683	0.1843

<sup>+</sup> If enterprise privatized before 2002; <sup>++</sup> if plot not privatized before 2002. Probit models with marginal effects reported. Robust standard errors, adjusted for clustering at regional level in parentheses. \*\*\*, \*\*, \* significant at 1%, 5% or 10% levels, respectively. Controls also included for sector, influence of workers, management, Russian enterprises. Other controls included are described in text.

Table 5 Motives for and barriers to privatizing primary production plot

	Privatized in 2002 or after	Privatized before 2002	
<b>Motives <sup>+</sup></b>			
Increased security of property rights	71.1	50.0	***
Increased asset value, investment attractiveness	58.9	31.4	***
Increased access to credit	53.3	27.1	***
Danger rental rate grows faster than land tax	34.4	25.7	
Rental rate greater than land tax	23.3	18.6	
Danger lease modified unfavorably	18.9	15.7	
Danger lease not extended	11.1	17.1	
<b>Barriers <sup>++</sup></b>			
Non-transparent regulations governing land purchases	28.6	29.6	
Opposition of officials to sale of land to enterprises	25.3	18.8	
Defining and agreeing on plot boundaries	22.0	14.5	
Inadequate resources, difficulty accessing credit	20.9	20.3	
High cost of completing documents to purchase land	20.8	17.4	
Incomplete process of assigning land to appropriate government level	15.4	20.3	
Government registering rights to land	9.9	18.8	
Unresolved disagreements regarding sub-dividing	8.8	8.7	
Absence of documents conferring rights to land	5.5	7.2	

<sup>+</sup> Percentage responding 5 on 1-5 scale; <sup>++</sup> percentage responding 4 or 5 on 1-5 scale. \*\*\*, \*\*, \* difference significant at 1%, 5% or 10% levels, respectively.

Table 6 Barriers to privatizing plot

	Opaque regulations	Official opposition
(Log) urban commercial-residential land owned by juridical relative to that owned by municipalities and government	-0.249* (0.138)	-0.437** (0.176)
Plot characteristics		
Only one "on balance" of enterprise when enterprise privatized	-0.562** (0.219)	-0.320 (0.211)
"On balance" of enterprise when enterprise privatized	-0.515** (0.224)	-0.188 (0.369)
Class I harm category	-0.486 (0.389)	-1.705*** (0.610)
(Log) number of hectares	-0.082 (0.097)	-0.052 (0.095)
Privatized before 2002	0.008 (0.292)	-0.255 (0.248)
Other enterprise characteristics		
Member of government corporation	-0.008 (0.470)	-1.337*** (0.423)
Influence of foreigners	0.000 (0.105)	0.300*** (0.099)
Sum of other "barrier" responses	0.121*** (0.021)	0.160*** (0.020)
N	129	129
Pseudo R2	0.2163	0.2964

Ordered probit models. Robust standard errors, adjusted for clustering at regional level in parentheses. \*\*\*, \*\*, \* significant at 1%, 5% or 10% levels, respectively. Other controls included are described in text.

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Bank of Finland  
BOFIT – Institute for Economies in Transition  
PO Box 160  
FIN-00101 Helsinki

 + 358 10 831 2268

[bofit@bof.fi](mailto:bofit@bof.fi)

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