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Paul Castañeda Dower and William Pyle

Land rights, rental markets and
the post-socialist cityscape



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Abstract

Inefficiently organized, factory-dominated cityscapes have been one of the more enduring legacies of the twentieth century experiment with socialist central planning in Eastern Europe and the Soviet Union. Drawing on a unique survey of large, formerly state-owned urban industrial firms in Russia, we explore how land tenure reforms affect the pace at which this legacy is being erased. Specifically, the privatization of plots is shown to promote the development of a rental market that transfers land use rights away from socialist-era industrial users. We address the potential endogeneity of land tenure in two ways, including using a measure of regional variation in urban land policy as an instrumental variable.

Keywords: land titles; firms; misallocation; transition; urban land; rental market; Russian Federation.

JEL codes: D22, D23, O18, P25, P26, R14.

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1 Introduction

Eurasia's now defunct socialist systems made industrial location decisions in relative ignorance of land's opportunity cost and thus produced inefficiently laid out, factory-dominated cityscapes (Bertaud and Renaud, 1997). Russia, as much as any country, reaped this legacy and, in spite of the dramatic reforms of the early 1990s, has seen it endure to the present day. Market forces, that is, have been slow to reallocate Russia's urban land to new users more capable of exploiting its value. Large swaths of real estate in the country's largest cities have remained stubbornly attached to old industrial firms even as new and more dynamic firms complain of problems acquiring suitable land (Bertaud, 2010; World Bank, 2012). Ironically, the country with the world's largest landmass appears to suffer from a scarcity of urban land (McKinsey, 1999; Muir and Shen, 2005; Survey of Land, 2006; Zhuravskaya *et al.*, 2005).

Why have newly liberalized markets been so slow to reallocate urban plots from old to new users? Our answer here draws attention to the role of land tenure institutions. Russia's slow privatization of land underneath otherwise privately-owned enterprises appears to have delayed the de-industrialization of the country's hyper-industrialized cities. To demonstrate this point, we exploit a unique survey, rich in land-related detail, of managers at large privatized urban industrial firms. Despite facing no additional formal constraints, those that have not taken ownership of their plots rent them out at a lower frequency than those that have acquired private tenure to their land. The privatization of plots, we show, promotes the development of a rental market that transfers land use rights away from socialist-era industrial users.

While this correlation between urban land tenure and urban land reallocation is consistent with a causal relationship, it is not interpretable as such given that land rights may be endogenous. We try to address this concern in two ways. First, one might presume the existence of a firm-specific proclivity for market-oriented activity that drives the decisions both to privatize land and to engage in land transactions. To address this possibility, we take advantage of the survey to augment the indicator of private land tenure to include firms which plan to take ownership of their plot in the future. Although this augmented variable might reasonably be presumed to track the proclivity for market-oriented activity, we find that it is not correlated in a statistically significant sense with renting out land. That is, consistent with a causal story, only current, not current plus planned, private tenure status maps to current rental activity.

Second, we take advantage of substantial land policy variation across Russia's territorial units to instrument for the tenure status of a firm's land plot. Geography – in the sense of the region (or territorial subject) in which a firm is located – has an exogenous effect on the current tenure status of a firm's land. Some firms happen to be in regions in which local policy renders

the effective price for privatizing urban land lower than in others.¹ Using a proxy for this policy variation across regions to instrument for the current tenure status of a firm's primary production plot, we continue to observe that firms that own their plots are more likely to dispose of their land through rental arrangements than firms that do not own their primary production plots.

The connection between land reallocation and private tenure rights could reflect demand and/or supply side factors. On the demand side, perhaps a "tragedy of the anticommons" slows the reallocation of publicly-owned urban real estate (Heller, 1998). The potential for having to deal with multiple overlapping claimants on non-private parcels may dispose lessees to transact with a single firm owner. Private ownership of land, in other words, by reducing a potential lessee's transaction costs increases their demand for rental plots. On the supply side, one can imagine at least two mechanisms at work. For one, if leasing out requires an up-front investment (*e.g.*, prepping the land, identifying a suitable tenant, and concluding a rental agreement), then private tenure rights may provide assurance that subsequent rental income is less likely to be threatened by capricious or corrupt officials. Similarly, if leasing alerts predatory officials to a plot's under-utilization and value, then the threat of its expropriation may be less if the lessor holds private title.² In both scenarios, private tenure would increase the supply of land to the rental market by increasing the security of the owner's claim over future rents.³ Below, after establishing a robust relationship between land tenure and reallocation through the rental market, we exploit the likely difference in value between plots located more and less centrally within an urban setting to provide evidence suggesting that this supply channel likely plays the more important role.

Our findings contribute to the literatures on urban economics as well as transition and development economics. A dominant theme in urban economics is the efficiency benefits of restricting private tenure rights in the context of a decentralized economy (Dunkerley and Whitehead, 1983). The experience of socialist cities, however, presents a stark example of the efficiency costs of suppressing decentralized markets (Bertaud and Renaud, 1997). Most of the evidence on the benefits of land markets for developing and transition countries derives from research on the agricultural sector or the urbanization of rural land (Kimura et al. 2011; Deininger and Jin, 2008). We are not aware of an empirical paper that rigorously investigates how property

¹ Solé-Ollé and Viladecans-Marsal (2013) show that this phenomenon is not unique to Russia. They find that local politicians' ideology has an influence on land use regulations in Spain.

² Somewhat similarly, sub-leasing a government-owned plot could also lead to greater rent extraction by the government since officials presumably would have more direct information as to the plot's market value.

³ Alternatively, one can imagine a negative relationship between private tenure and property rights security if taking private ownership of land itself spurs government predation (Besley et al., 2012). Castañeda Dower *et al.* (2015) show that this effect may dominate if the surrounding institutional environment is particularly poor.

rights to land impact urban firms' land allocation decisions. In terms of urban land policy in developing countries, common themes are access to housing and particularly the problem of squatting and rapid urbanization (Malpezzi, 1999; Fernandes and Varley, 1998) but not access to land for firms. An emerging literature has begun to evaluate the efficiency of non-market land allocation by government. Lichtenberg and Ding (2009) find that state officials respond to market incentives in China in allocating land for urban use. However, Wang (2011) provides evidence of inefficiencies in the state-allocation of housing in China. We contribute to these separate strands of literature by taking the level of misallocation inherited from the Soviet past as a given, and answering whether land titles lead to reallocation.

The paper is organized as follows. Section 2 provides relevant details of the Russian context, highlighting how the combination of the country's recent property rights reforms and its socialist inheritance of spatial misallocation offers a unique setting in which to explore the relationship between tenure rights and land reallocation. Section 3 introduces the survey of large urban industrial firms. In section 4, we explore the relationship between tenure rights and leasing activity. Section 5 expands on this initial exploration by introducing an instrumental variable estimator to address the potential endogeneity of land tenure. Section 6 uses additional survey evidence to consider the mechanism underlying the relationship between land tenure and rental markets. Section 7 concludes.

2 The Russian context

2.1 Policy governing land tenure⁴

As elsewhere in the former socialist bloc, Russia launched a massive privatization program a little over two decades ago. But its approach to reforming ownership rights over state-owned enterprises differed in at least one fundamental way from many of its neighbors, particularly those in Central and Eastern Europe. Instead of simultaneously privatizing a firm's capital stock and its land, only the former – *i.e.*, equipment, buildings and other structures – was covered by the initial reform. Largely for reasons of expediency, land plots at tens of thousands of medium and large privatized enterprises in Russia remained state-owned. Surprisingly, this distinction has gone unremarked upon in almost all commentaries relating to post-socialist privatization and its effects.⁵

⁴ This section draws on a similar discussion in Karas *et al.* (2015), an article that relies on the same survey data as that used here.

⁵ For example, see any of the studies referenced in the widely-cited literature review of Estrin *et al.* (2009). Noteworthy exceptions to this rule include Boycko *et al.* (1995), Heller (1998), McKinsey Global Institute (1999) and

In enumerating a right to private land, Russia's 1993 constitution established the legal basis for revisiting the initial decision to divide ownership over land plots and their attached capital. Although regarded as "incomplete ... and sometimes ambiguous," a subsequent set of rules paved the way for some privatized firms to take ownership of their plots. A decree issued by President Boris Yeltsin in 1994 laid out procedures for privatized non-agricultural enterprises to take ownership of their land, and a subsequent decree reduced the legal sale price. But due to the federal government's weakness in the 1990s, land privatization proceeded slowly. In fact, 32 federal regions, including the capital Moscow, passed outright bans on the privatization of land (Kaganova, 1998; Limonov *et al.*, 2001).⁶ A breakthrough occurred in 2001 when President Vladimir Putin's administration successfully pushed through the national legislature a Federal Land Code. Designed to reinvigorate the process begun under Yeltsin, it further clarified procedures to divest state lands under privately owned structures and to unify titles to land and capital (Remington, 2002; *Survey of Land*, 2006). Many private firms responded to the Land Code by taking ownership over the plots on which they sat. Between 2001 and 2010, as highlighted in Figure 1, the stock of urban land owned by private firms expanded nearly six-fold. Nevertheless, despite this clear trend, a comprehensive survey conducted in 2011–12 revealed that only a quarter of Russian firms based in cities of over 50,000 held title to their land.⁷

The time series depicted in Figure 1 conceals a great deal of variation in the pace of urban land privatization across the Russian Federation. Despite the Putin administration's efforts to centralize political power and standardize economic policy, regional responses to the Land Code and other federal land-related initiatives varied tremendously. In 2007, for example, Federal Law 212 was passed with the intent to circumscribe regional governments' ability to manipulate the prices at which they could sell to enterprises the plots on which they sat, specifically requiring that they not exceed a certain percentage of the cadastral value. Many regions responded by raising the effective price either by hiking cadastral values and/or erecting new bureaucratic obstacles to plot privatization (Vasilieva, 2011; Yel'kina; *Interfaks*, 2011). As a consequence, while in some regions ownership rights over a non-trivial share of urban land has been transferred to firms, in others, nearly all enterprise land is leased from the government (Kisunko and Coolidge, 2007; *Survey of Land*, 2006).

Karas *et al.* (2015). The latter draws on the same enterprise survey used in the analysis here to demonstrate a relationship between private land tenure, on the one hand, and access to external finance and investment intensity on the other.

⁶ We use the terms territorial subjects and regions interchangeably. The Russian Federation currently is comprised of 83 territorial subjects (including the cities of Moscow and St. Petersburg), each with equal representation in the Federation Council.

⁷ See <http://ebrd-beeps.com/data/beeps-v-and-mena-es-2012-2015/>.

Comprehensive data on land ownership at the level of Russia's territorial subjects is difficult to uncover. By far the most complete source of data on regional land stocks that we have was made available by the Federal Agency for the Real Estate Cadastre (*Roskadastr*); specifically, these data cover stocks of land as of January 1, 2008.⁸ Similar data from earlier years were not, to our knowledge, ever made available. Of the 7875.5 thousand hectares of land in urban settlements, the *Roskadastr* data designated roughly 45 percent as residential-commercial-industrial land. Of Moscow's 109.1 thousand hectares, for instance, roughly 77 percent was so described, as were half of St. Petersburg's 139.9 thousand hectares.⁹ In the absence of any indicators that describe the uses of land in greater detail, we interpret the ratio of urban residential-commercial-industrial land owned by firms to that owned by the government as a good measure for the pace and extent of urban industrial land privatization in a particular region. Below, we present evidence as to its suitability in this regard. Table 1 lists this land index by territorial subject as well as the number of firms in each region that participated in our survey.

2.2 Allocation and reallocation of urban land

The socialist development 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. Unlike many cities outside the socialist bloc which experienced an out-migration of land intensive industries for locales where land values were lower, socialist cities in the twentieth century became progressively more industrialized. By the 1990s, over one-third of the built-up area in Russia's largest cities was taken up by industrial land whereas the norm elsewhere – in cities as diverse Seoul, Atlanta, Hong Kong, London and Paris – was around five percent (Bertaud, 2004).¹⁰

The “big bang” privatization and marketization that Yeltsin's government launched in 1992 was actually quite slow to disrupt this pattern. Well into the reform period, large swaths of

⁸ The website with the comprehensive regional data was at http://www.kadastr.ru/available_land_2008/. In March 2009, the agency was subsumed by the Federal Service for Registration, Cadastre and Cartography (*Rosreestr*). After *Roskadastr* was subsumed by *Rosreestr*, the website was no longer available.

⁹ 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.

¹⁰ Central and East European cities, which had also been shaped by the socialist development model, although for a generation less than those in the Soviet Union, had ratios that were greater than cities outside the socialist bloc but less than cities like Moscow and St. Petersburg. For instance, Prague, Warsaw, Sofia, Ljubljana and Krakow had ratios between 13% and 28% (Bertaud, 2004).

valuable land remained attached to old industrial users (Bertaud, 2010; World Bank, 2012). Although reallocation to non-industrial uses and users proceeded at a steady pace in some cities (Molodikova and Makharova, 2007), in others, it did not. One World Bank analysis concluded that the inability to access land on transparent terms constituted as big an obstacle to business development in Russia as anywhere in the world (Muir and Shen, 2005). And for Russian firms with direct experience in trying to acquire land, the difficulties they experienced exceeded those related to problems more often considered endemic to Russia, such as corruption and under-developed capital markets (*Survey of Land*, 2006; Zhuravskaya *et al.*, 2005).

The 2009 round of the Business Environment and Economic Performance Survey (BEEPS), jointly administered by the World Bank and the European Bank for Reconstruction and Development, highlighted the ongoing significance of land access problems in Russian cities. Of over a thousand surveyed firms in Russian towns and cities exceeding a population of 50,000, access to land was characterized as a “very severe obstacle to current operations” (*i.e.*, a response of “5” on a 1–5 scale) by almost one quarter. As shown in Figure 2, of eighteen potential obstacles addressed in the survey, only problems associated with electricity were characterized as such at a higher rate. And as shown in Figure 3, the problem of access to land was particularly acute in Russia. Compared to urban enterprises in the eight Central and East European countries that acceded to the European Union in 2004, Russian firms were seventeen percentage points more likely to describe access to land as a very severe obstacle. In this relative sense, in fact, land access was the single most significant obstacle facing Russian firms.

3 Survey of large, urban, industrial firms

To address whether private land tenure affects firms’ propensity to lease out land, and thereby mitigate problems with land access and urban spatial misallocation, one of us collaborated with Moscow’s Levada Centre to design and administer a survey of managers at 359 large urban industrial firms in the fall of 2009. To focus on firms likely to operate on large plots of land, we addressed only those that had at least 500 employees in 2007. We also restricted analysis to former state-owned enterprises that had been founded prior to 1986 but had been privatized prior to 2004. By design, roughly half of the firms were from regions with more progressive policies *vis à vis* urban land (*i.e.*, in the top third of the regions in Table 1). 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; 0.5 million to 1 million; and 0.25 to 0.5 million. In all, the respondents represented 53 territorial subjects (see Table 1).¹¹

Respondents answered general questions regarding their firms 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 the 172 (or 48 percent of) firms that owned it and the remainder that did not.¹² Table 2 presents characteristics of the enterprises and their primary production plots, separating those with private tenure from those without.

All respondents were asked whether they leased (or sub-leased) out a portion of their primary production plot. Though Chapter IV (Articles 20–24) of the Land Code permits any firm to lease or sub-lease the land on which it operates, regardless of ownership status, Table 2 demonstrates that firms that own their primary production plot rent out their land at a higher frequency. Fully 20.5 percent of respondents that own their primary production plot report renting out a portion of it, whereas the rate for those that do not own their land is only 9.1 percent. Although only an unconditional correlation, these data are certainly suggestive of a causal link between land tenure and land reallocation.

Roughly half of the plots were located centrally, either in the city's "historical center" or one of its centrally-located population zones; the remainder were described as being on the city's periphery. Most were located near other enterprises. Over 80 percent of the plots were used at full capacity at the time at which the enterprise (*i.e.*, its capital stock) was privatized. Very small percentages of the respondents reported either that their plots had been categorized as environmentally dangerous or that portions of them had been sub-leased even prior to their privatization. Many of these primary production plots had assets on them when the firms' capital stock was privatized. Nearly 90 percent had office buildings, over a third had social assets (*e.g.*, residential buildings, medical centers, sports facilities), and not quite one-fifth had stores or exhibi-

¹¹ 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 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.

¹² Of those respondents that do not own their primary production plot, 70 percent use their land under lease-holding rights and the remainder continue to operate under the old social form of tenure – *i.e.*, permanent (perpetual) use rights – which, like lease-holding rights – grants its holder the ability 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 was characterized as permanent only because a termination date was not specified. The Land Code of 2001 included provisions to have it eventually phased out.

tion halls. About 80 percent of the plots had been attached to the firm at the time of its privatization; the remainder, a small minority of the plots under consideration, that is, were acquired after privatization.

Firms in the sample had at the time of the survey, on average, over one thousand employees and had been privatized nearly 15 years prior.¹³ Because of the prominence of leasing rights in Moscow where 48 of the respondents are located, we see that firms with private ownership are, on average, located in smaller cities. About 30 percent of firms in the sample belong to a commercial group. Firms that own their plots are, on average, more profitable than others, a difference, which on a rather coarse profitability scale from 3 to 9, is statistically significant.¹⁴

Among the firms that own their primary production plot, the median year for its privatization was 2003. Sixty-seven firms paid less than the full cadastral value to purchase the plot (an average rate of 5.6 percent of the cadastral value, and a median of 2.5 percent); 41 paid the full cadastral value; and 20 report paying a price tied to the annual land tax (an average factor of 9 times greater, and a median of 5.5); four had “other” arrangements; and the rest did not answer that question.¹⁵

4 Tenure status and rental activity

Table 2 documents a strong unconditional correlation between rental activity and the tenure status of industrial firms’ production plots. This correlation, however, does not imply causality as it may very well be driven by other factors. Table 2, indeed, shows that some firm and plot characteristics vary considerably with tenure rights. To explore whether the unconditional correlation between our main variables of interest survives the presence of additional firm and plot controls we estimate the following probit model:

$$A_i = \mathbf{1}(\alpha + \varphi T_i + \text{Controls} + \varepsilon_i > 0) \quad (1)$$

The dependent variable $A_{i,j}$ is the answer (expressed as the value of a binary variable) of the i^{th} firm to the question about rental activity. T_i is a dummy that takes on the value of one (zero, otherwise) if the firm’s primary production plot is owned privately, $\mathbf{1}()$ is the indicator function

¹³ The median year of privatization was 1993. All had been privatized by the end of 2004. Ninety percent of those surveyed had been privatized prior to 2001.

¹⁴ This variable was constructed by summing up scaled responses to questions on profitability in 2007, 2008 and 2009 in which a response of 1, in a given year, was equivalent to being loss-making, 2 to being neither profitable nor loss-making and 3 to being profitable.

¹⁵ 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%.

and ε is a disturbance term drawn from a standard normal distribution. Our baseline specification controls for the (log) number of years since the firm's capital stock (not the plot) was privatized, the (log) number of full-time employees, sector dummies, the population of the city in which the firm is located¹⁶ and a number of characteristics of the firm's primary production plot. These include dummies for being located centrally within the city, for having been (at least, in part) rented out prior to privatization, for not being attached to the firm at the time of its privatization, and for being designated as the most dangerous category in terms of environmental hazards. An additional plot-specific control captures on a 1–3 scale the number of enterprises in the plot's immediate vicinity: 1 represents none, 2 represents one or two, and 3 represents more than two. Separate controls include dummies for the presence of various real estate assets – office buildings, social assets, and stores – and whether or not the plot's land capacity was fully utilized at the time of the enterprise's privatization.

Additional controls added in further specifications capture features of the firm's ownership structure. These include a dummy variable that takes on the value of one if the firm is a member of a commercial group (*e.g.*, a financial-industrial group or a holding company). Additional ownership variables measure on a 0–4 scale the ownership influence of foreigners, the State Property Fund, non-management labor employed by the firm and Russian individuals not employed by the firm; a score of 0 is recorded if there is no representation of the given group among shareholders, 1 is equivalent to the group being represented but having little influence on the strategic direction of the firm, 4 denotes the group having a great deal of influence. In some specifications, we also control for a firm's recent financial health by including an ordered variable, scaled from 3 to 9, constructed by summing answers to questions on profitability from 2007–09 in which a response of 1, in a given year, was equivalent to being loss-making, 2 to being neither profitable nor loss-making, and 3 to being profitable.

One model includes controls for a set of regional economic characteristics, measured in 2008, plausibly connected to regional land policies and rental market activity: gross regional product per capita, the share of the regional population categorized as urban, the region's area (in thousands of square kilometers), and, separately, contributions of three sectors – manufacturing, wholesale and retail trade, and transport and communications – to gross regional product.¹⁷ An additional model controls for regional fixed effects.

¹⁶ The city size variable is scaled from 1, cities under one-quarter million, to 5, cities over three million.

¹⁷ These data, compiled from a variety of official Russian sources, were accessed at <https://iims.hse.ru/en/csid/databases>.

Table 3 lays out the results from the probit models. Despite having included a rich array of firm-specific controls, we observe in columns 1 and 2 a strong and positive correlation between private land tenure and (sub-)leasing out land. As shown in columns 3 and 4, this relationship continues to hold whether controlling for a set of regional economic characteristics or regional fixed effects. Across all four specifications, the correlation remains statistically significant at the 1 percent level. Depending upon the model, firms with private tenure are between 8 and 16 percentage points more likely to report (sub-)leasing out a portion of their primary production plot.

Looking at other controls, we observe that centrally-located firms rent out more frequently, possibly reflecting the greater demand for their plots. Larger firms, measured by employment, are more apt to rent out land. And, not surprisingly, the small percentage of firms that sub-leased a portion of their plot prior to their enterprise being privatized report (sub-)leasing at higher rates in the aftermath of privatization.¹⁸

Recognizing the potential endogeneity of land tenure, we are reluctant to attribute a causal relationship between it and rental activity. An obvious concern is that, despite our inclusion of a rich set of controls, an unobserved firm-level characteristic drives the decisions both to privatize one's land and to lease it out. Some firms, for example, may have an innate proclivity to engage in market transactions, with this characteristic being related both to their demand for land privatization and their supply of land to the rental market. To address this possibility, column 5 replaces the main variable of interest with a more expansive binary measure of the demand for land privatization. It takes on the value of one if firms have either already taken ownership of their primary production plot or if they report wanting to do so in the future. Of the 186 firms without private title at the time of the survey, 121 report planning to take ownership of their primary production plot. Although this augmented variable might reasonably be presumed to track a firm-specific proclivity for market-oriented activity, we observe in column 5 that it is not correlated in a statistically significant manner with renting out land. Consistent with a story that private tenure affects the propensity to rent out land, that is, only current tenure status, not current plus planned, maps to current rental activity.

¹⁸ The number of these firms, however, is small and does not permit exploring a differential effect of tenure status for those firms that did not sub-lease land prior to the enterprise being privatized.

5 An instrumental variable approach to addressing potential endogeneity of land tenure

It remains possible that another firm-specific factor may affect our dependent variable as well as our independent variable of interest. Furthermore, it is not wholly inconceivable that the observed correlation between private land ownership and leasing activity may result from reverse causation, for instance if firms generating income by renting out land have a greater capacity to purchase their plots. To address both types of identification problems we turn to an instrumental variable estimator, a strategy widely employed in the empirical literature devoted to assessing the economic effects of property rights. Specifically, we propose using the regional urban land privatization index presented in Table 1 to instrument for the tenure status of a firm's primary production plot. As noted earlier, in spite of federal-level efforts to standardize policy across the country, regional officials have been able to affect the difficulty, or effective price, of privatizing plots. We interpret this land index as capturing this well-documented variation in land policy across regions in a manner exogenous to individual firms.¹⁹ Where it is higher, that is, we consider the policy environment to have been more conducive to plot privatization. Moreover, the suitability of the index as an instrument rests on its plausible exclusion from the second stage of the IV-model, since it is difficult to conceive of an alternative channel (*i.e.*, other than through its effect on the tenure status of a firm's land plot) through which regional policy toward land privatization might have affected rental activity.

Some anecdotal evidence supports the interpretation of the land index as a suitable proxy for land policy. For instance, in a manner consistent with its extremely low ranking in Table 1, the city of Moscow's policy environment is well known to have been particularly hostile to land privatization (Kisunko and Coolidge, 2007). We would, however, like to provide more comprehensive support that the index captures land policy variation across regions. Exploiting the survey data, we do so in two ways. One relies only on firms that have taken ownership of their primary production plot. The other draws on the entire sample.

We first look at a response to a survey question addressed exclusively to firms that own their primary production plot. Each was asked to evaluate on a 1–5 scale the severity of eight different obstacles they may have confronted when trying to privatize that particular plot, one of

¹⁹ A claim of exogeneity implies that the regional share of private land is not influenced by any of the surveyed firms that own their primary production plot. For all intents and purposes, this is the case. Of the 359 firms in the database, only six report owning production plots (privatized before 2008) whose area accounts for more than ten percent of the region's urban private commercial/residential land in 2008 (*i.e.*, the numerator in our land index).

which was the “opposition of local officials.”²⁰ Just over half of the 169 firms that answered this question responded “1,” indicating local officials posed no such obstacle. Just under ten percent of firms, however, responded “5,” reflecting that local officials had been a particularly severe obstacle to the process’ completion. The average response was 2.1. If our land index captures the policy variation that we claim, it should explain the variation in the response to this question. That is, we would expect a negative correlation between its value and the assessment of individual firms – specifically, those that had experienced the process of plot privatization from beginning to end – as to the degree of opposition presented by government officials. We present tests for this relationship in Table 4. Controlling for the same firm and plot characteristics we included in columns 1–3 of Table 3, as well as for a variable capturing the sum of the responses to the seven other perceived barriers to plot privatization, we see that those firms located in regions where the index of land privatization is high are less likely to characterize government opposition as a significant barrier to plot privatization.²¹ Consistent with the index capturing the effective price of privatizing one’s primary production plot, this effect is statistically significant at the 1 percent level across all three specifications.²²

The second piece of survey-based evidence demonstrating the appropriateness of the land index as a worthy proxy of regional policy draws on a question addressed to all firms. Each was asked whether it had ever sold a plot of land; only nine percent (32 of 358) had. It is not unreasonable to presume that firms would be more likely to sell land in regions with a more accommodating policy environment for taking private ownership of land. Indeed, this is what we find. In columns 4–6 of Table 4, we observe that the proxy for regional policy is strongly and positively correlated with firms reporting having sold a plot of land. Across three specifications with controls similar to those introduced in Table 3, this effect is significant at the 1 percent level of significance.

²⁰ In addition to the “opposition of local officials,” the other seven barriers include the firm does not possess adequate resources (including access credit), there are unclear rules regulating purchases of land, the process of assigning land to an appropriate level of government has not been completed, there is a high cost of completing the documentation to purchase land, the documentation confirming firm’s right to the plot is absent, the plot’s boundaries have yet to be defined and agreed upon.

²¹ We control for the average 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.

²² As shown in Karas *et al.* (2015), this relationship holds equally well when restricting the sample to those firms that took ownership of their plot relatively early or to those who took ownership relatively late, a finding consistent with the land index – which is based on land stock data from 2008 – capturing a consistent pattern of regional policy variation across the period of time spanning the earliest plot privatizations in the 1990s and the date of the survey.

Having presented evidence that the regional land index captures variation in land policy, we turn in Table 5 to our instrumental variables specification.²³ Columns 1–3 include the same set of controls as in the first three columns of Table 3. That is, to our baseline in column 1, we first add commercial group, profitability and ownership controls (in column 2) and then a set of regional characteristics (in column 3). The first-stage IV regression results show consistently that the regional land policy index strongly predicts private tenure status. The fact that we observe in our IV models that surveyed firms are more likely to have taken ownership over their primary production plot in regions where the index of urban industrial land privatization is high, even after controlling for a number of firm and plot-specific characteristics, gives us confidence that the index indeed captures the land policy variation we have argued it does and is therefore an appropriate instrument. In column (1), the second stage results show a statistically significant positive relationship between the predicted value of private plot status and the firm's rental activity. The magnitude of the effect is somewhat larger than the corresponding naïve estimate. In columns (2) and (3), the magnitude and sign of the marginal effect remains stable and is statistically significant at the 5% level in column (2) but loses statistical significance in column (3). The p-value is 0.11, however, and the addition of the regional controls increases standard errors but does not change the magnitude of the effect. Since the variation in the instrumental variable is at the regional level and the number of regions is not large, the lack of statistical significance is understandable. The instrumental variables estimation results therefore provide additional support for the proposition that private land rights facilitate land reallocation through the rental market.²⁴

6 Mechanisms linking tenure status and rental activity

To better understand the relationship between land privatization and reallocation, we explore whether the change in behavior due to alleviated constraints reflects better a response on the demand or supply side. We first investigate demand side factors. For urban firms, location of a

²³ Karas *et al.* (2015) demonstrate that regional variation in land policy is related to both supply and demand factors present in the mid-1990s. The supply of privatize-able land derives from the incentives of regional officials. Where land is more valuable, where its potential to generate rents, that is, is greater, officials are less likely to supply policy that enable its privatization. Two proxies for the average value of urban land in a given region are its urbanization rate and its per capita income. The demand for private land tenure relate to a region's economic structure and the health of its economy, which can be proxied for by the share of non-loss-making firms and the contribution of industry to regional gross product. Together these four variables, measured in 1995, explain nearly half the variation in the regional land index.

²⁴ It is difficult to find other variables that capture variation in land policy across regions in a manner that is exogenous to individual firms and that can therefore serve as other instruments for the tenure status of a firm's primary production plot. Variables related to land policy that are not also related, by some direct or indirect channel, to the dependent variable in the second stage regressions, are elusive.

plot is crucial aspect of the demand for the plot (Kowalski and Paraskevopoulos, 1990). To capture differences in demand, we use a dummy variable indicating whether the primary production plot is located in the city center or not. Plots in the city center should be more desirable for firms, especially firms in the service sector, and this land is more scarce than on the periphery. We would therefore expect to find a greater impact of land privatization on land market activity for those firms who possess a private title on plots located in the city center. In Table 6, columns 1–3 report estimates of the marginal effect of land privatization from a specification that incorporates the interaction term between plot location and tenure status. Regardless of tenure status, firms located in the city center are more likely to have rented out part of their plot, consistent with these plots being in greater demand. However, those firms with private title are no more likely to have rented out their plots. In fact, the marginal effect of land privatization is smaller for plots located in the city center but this difference is not statistically significantly different than zero. Thus, we find little support for demand side factors explaining the positive relationship between having a private title and land reallocation.

Our main dependent variable thus far is an outcome of both supply and demand decisions. To better capture the supply channel, we investigate how private title affects firms' plans, which we observe due to the richness of the survey. In this analysis of future plans of the firm, we treat firms that already have private title and those who are planning to privatize their plots in the near future as similar and different than firms that have no intention of privatizing. We focus on the firm's plans to move production off of their primary plot to a different location, the main mechanism of improving allocative efficiency. Seven percent of firms are planning to relocate, which is a relatively large number considering the size of the firms in question. In column 1 of Table 7, we see that the marginal effect of land privatization on relocation plans is positive but not statistically significant. In column 2, we account for firms facing different conditions depending on whether their production plot is located in the city center. The estimated marginal effect of land privatization is larger for firms with city center plots but the effect is not statistically significant at conventional levels.

The imprecision in the estimates could be driven by the fact that there are two very different reallocation processes, centralized reallocation by the government and the decentralized reallocation of the land market, at work and may produce offsetting effects of possessing a land title on firms' expectations. While stronger property rights enable firms to better take advantage of their land assets upon relocation, either through selling the land or having greater security in a rental transaction, stronger property rights also protect firms from government initiatives to relocate firms against their will. Since we are focused on decentralized decisions, we exclude

those firms who plan to relocate because of government's initiative in columns 3 and 4.²⁵ The estimated marginal effect of land privatization on relocation is again positive and the magnitude is much larger but still imprecisely estimated. However, in column 4, once we account for the interaction between possessing a land title and being located in the city center, the results show that firms with private title on plots located in the city center are more likely to relocate under their own initiative than firms on city center plots without a land title. These results lend support to the thesis that private ownership aids allocative efficiency, provided the management of local externalities, something we have not addressed in this paper, is not overly exacerbated by the strengthening of individual control rights for the firm.

7 Conclusion

Property rights reforms can help deindustrialize the country's hyper-industrialized cities by giving incentives to reallocate land to more valuable uses. The results presented in this paper give evidence that the privatization of land underneath Russia's industrial enterprises has promoted land reallocation primarily through the land supply channel. First, we demonstrate that firms that have obtained land titles are more likely to rent out a portion of this plot. Second, we show that firms with land title on plots located in the city center are more likely to have plans to relocate from these high-demand areas. In these cities with a presumed high level of inherited misallocation, decentralized reallocation should improve allocative efficiency. Whether land titles do indeed improve it requires the efficiency benefits of reallocation outweighing the costs of greater reliance on decentralized decision-making in the presence of local externalities that are common in any urban context.

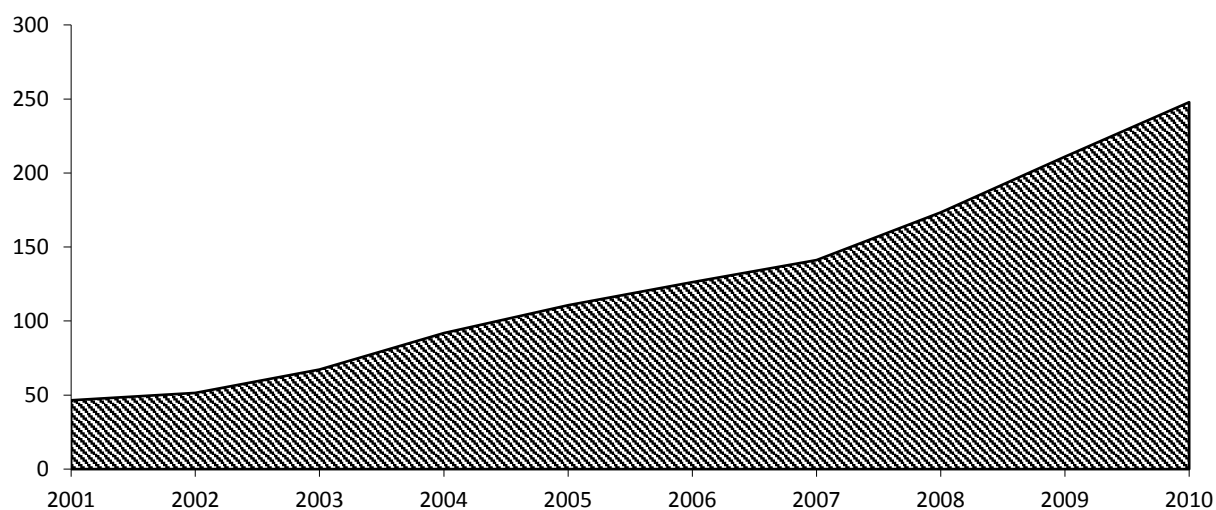
Both regulation and markets could correct for inherited land misallocation. The government certainly has made efforts to reallocate industrial firms. However, the slow development of urban land markets and concerns about government corruption justify a serious look at the functioning of land markets as an important policy tool for land reallocation. The apparent failure of land markets to fully correct for land misallocation over the past two decades does not imply that regulation would have been a more effective instrument of land reallocation. In some Russian regions, deliberately imposed bureaucratic obstacles to land privatization have inhibited the market mechanism of reallocation. In particular, among the firms in the survey who plan to obtain a land title but have yet to do so, those with plots located in the city center have statistically stronger

²⁵ Among those firms located in the city center, 1% of those with a land title plan to relocate by government initiative, compared to 6% of those without formal title. This is consistent with stronger property rights making it more difficult for the government to relocate firms, possibly against their will.

assessments (on a 5-point scale) of the following as difficulties that they may encounter: “Concerns that the terms of the lease agreement would be changed unilaterally and not in favor of our enterprise the lease agreement would not be renewed”; “Unwillingness of government bodies to sell the land plot into the ownership of the enterprise”; and “Large financial expenditures on the drawing-up of documents necessary for the restructuring of the land plot as a leasehold.” If regulators have an incentive to limit the spread of land privatization and these same incentives decrease the likelihood of regulatory action to encourage reallocation, then we would expect to see divergence in Russian regions due to persistent differences in the allocative efficiency of land.

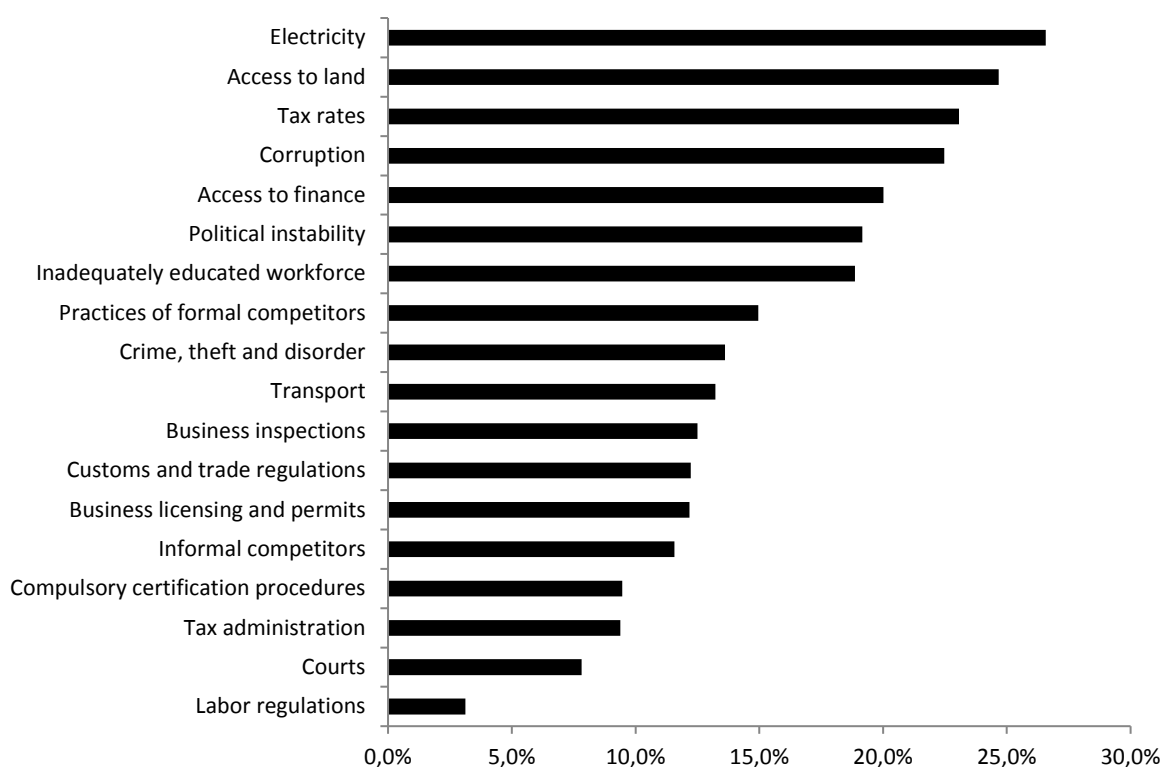
Figures and tables

Figure 1 Land owned privately by firms in urban settlements (1000s hectares)



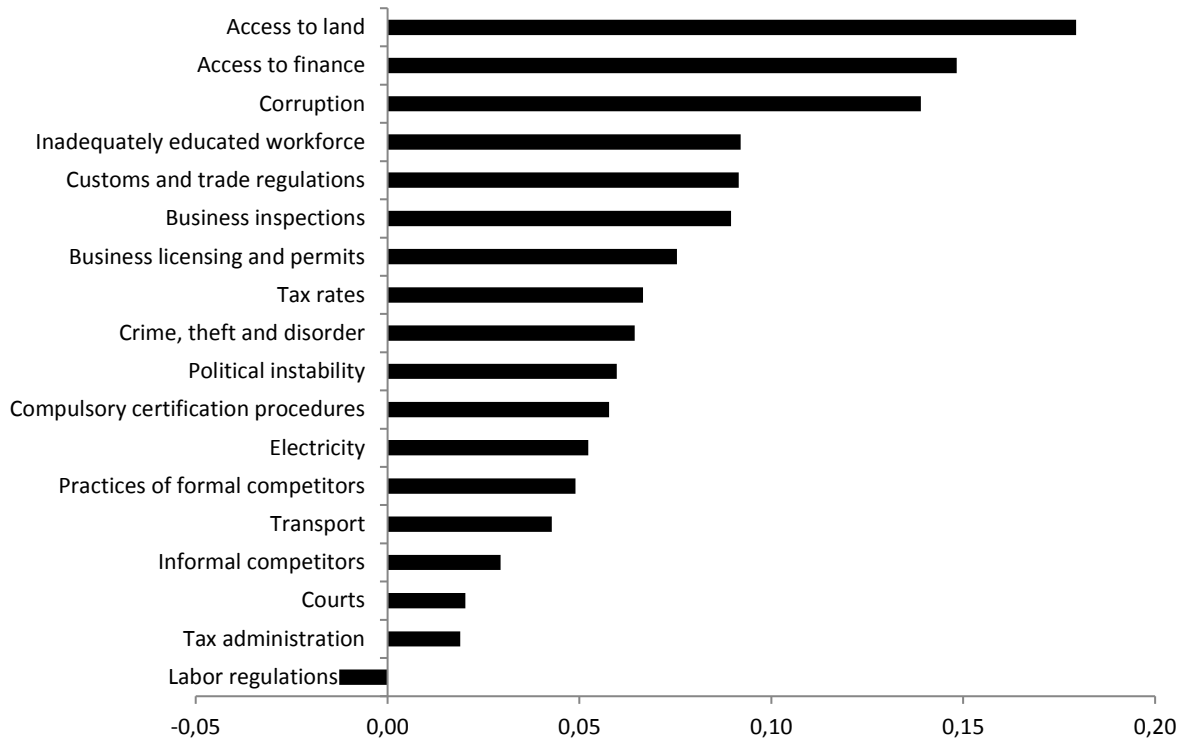
Source: *Gosudarsvennyi doklad*, various issues

Figure 2 BEEPS 2009, Russia
Managers describe factor as a “very severe obstacle to current operations”



Note: Average number of responses per “obstacle” question, 1127. All enterprises in cities with a population of at least 50,000.

Figure 3 BEEPS 2009, Russia and Central Eastern Europe
Difference between percentage of Russian and CEE firms with respect to factors managers describe as a “very severe obstacle to current operations”



Note: Average number of responses per “obstacle” question, 1127 in Russia and 1285 in Central and Eastern Europe. All enterprises in cities with a population of at least 50,000. The CEE firms represent eight countries: Poland, Czech Republic, Slovak Republic, Hungary, Slovenia, Estonia, Latvia and Lithuania.

Table 1 Ratio of urban commercial-residential-industrial land owned by firms to that owned by state & municipalities, 2008

		surveyed firms			surveyed firms
Belgorod	0.249	6	Tver	0.022	2
Vologoda	0.238		Tula	0.022	6
Tatarstan	0.189	13	Krasnodar	0.022	5
Lipetsk	0.148	10	Chukotka	0.022	
Novgorod	0.082	4	Sakha	0.021	
Orenburg	0.081		Oryel	0.020	
Kemerovo	0.074	5	Ingushetiya	0.020	
Tyumen	0.073	3	Samara	0.019	9
Khakasiya	0.064		Krasnoyarsk	0.019	3
Irkutsk	0.064	6	Bryansk	0.018	5
Chuvash	0.060	2	Kaliningrad	0.017	3
Sverdlovsk	0.060	17	Ivanovo	0.016	4
Novosibirsk	0.060	3	Tambov	0.016	4
Tomsk	0.055	8	Adygeya	0.016	
Smolensk	0.051	7	Altai k.	0.016	2
Chelyabinsk	0.048	17	Udmurtia	0.015	4
Leningrad	0.046	6	Buryatia	0.015	3
Rostov	0.045	10	Arkhangelsk	0.014	4
St. Petersburg	0.044	24	Murmansk.	0.014	
Karachevo-cherk.	0.048	1	Ulyanovsk	0.012	3
Kirov	0.039		Chita	0.010	
Kurgan	0.039	2	Kabardino-Balk.	0.009	
Nizhny Novgorod	0.039	14	North Ossetiya	0.009	
Kareliya R.	0.037	2	Volgograd	0.008	9
Vladimir	0.036	3	Mordovia	0.007	
Kursk	0.035	3	Penza	0.007	5
Yaroslavl	0.033	8	Astrakhan	0.005	1
Komi R.	0.033		Bashkortostan	0.005	11
Stavropol	0.033	6	Sakhalin	0.005	
Primorye	0.033		Omsk	0.004	7
Kaluga	0.031	5	Amur	0.004	
Ryazan	0.031	5	Moscow city	0.002	48
Perm	0.028	13	Khabarovsk	0.001	2
Marii El	0.027		Kalmykia	0.000	
Pskov	0.025	1	Altai r.	0.000	
Kostroma	0.024	5	Tuva	0.000	
Daghestan	0.024		Kamchatka	0.000	
Voronezh	0.023	4	Magadan	0.000	
Moscow o.	0.023	1	Jewish A.O.	0.000	
Saratov	0.023	5	Chukotka	0.000	

Data source: http://www.kadastr.ru/available_land_2008/ and author survey

Table 2 Characteristics of enterprise and primary production plot by land tenure status

	Private	Non-private	
Primary production plot			
Leasing/sub-leasing out portion currently (%)	20.5	9.1	***
Centrally located within city (<i>i.e.</i> , not on city's periphery) (%)	56.7	49.5	
Number of other enterprises close by (1=none, 2=one or two, 3=more than two)	2.5	2.6	
First category of environmental harm (%)	4.7	5.4	
Not on balance when enterprise privatized (%)	18.1	21.5	
Used at full (100%) capacity when enterprise privatized	80.6	84.3	
Leased/sub-leased out portion when enterprise privatized	4.7	2.2	
Office buildings on when enterprise privatized	89.5	87.1	
Social assets on (<i>e.g.</i> , residential buildings, medical centers, sports facilities) when enterprise privatized	34.0	45.7	**
Stores, exhibition halls on when enterprise privatized	20.5	15.6	
Enterprise characteristics			
Full-time employees	1249.1	1436.7	
Years since enterprise was privatized	14.4	14.8	
City size in which located (1–5 scale)	3.0	3.6	***
Member of commercial group	30.6	31.2	
Ownership influence of state property fund (0–4 scale)	0.3	0.4	
Ownership influence of non-management labor force	1.4	1.2	
Ownership influence of outside Russian individuals	1.5	1.3	
Ownership influence of foreigners	0.5	0.5	
Profitability in 2007–09 (3–9 scale)	7.8	7.4	**

Notes: ***, **, * difference significant at 1%, 5% or 10% levels, respectively; t-test on equality of means. The phrase “when enterprise privatized” refers to the enterprise’s capital stock not its primary production plot. For firms whose primary production plot was not used by the firm (*i.e.*, “not on balance”) when its capital stock was privatized, this phrase “when enterprise privatized” refers to when the plot first came to be used by the firm. For instance, for a firm operating on a plot that was not on its balance when it was originally privatized, the variable “office buildings on when enterprise privatized” refers to whether or not there were office buildings on the plot *at the point in time that the firm began using the new plot*.

Table 3 Tenure status and (sub-)leasing out portion of primary production plot

	(1)	(2)	(3)	(4)	(5)
Plot owned privately	0.110*** (0.037)	0.094*** (0.031)	0.082*** (0.029)	0.165*** (0.042)	
Plot owned privately (either currently or planned)					0.032 (0.031)
Centrally located	0.078** (0.040)	0.087** (0.036)	0.072* (0.037)	0.124** (0.058)	0.078** (0.037)
Other enterprises close by	0.028 (0.027)	0.024 (0.026)	0.034 (0.024)	0.019 (0.035)	0.038 (0.026)
First category of environmental harm	0.139 (0.119)	0.143 (0.116)	0.129 (0.113)	0.347 (0.228)	0.111 (0.107)
Not on balance when enterprise privatized	-0.036 (0.035)	-0.031 (0.031)	-0.035 (0.026)	0.000 (0.044)	-0.044* (0.026)
Used at full capacity when enterprise privatized	-0.068 (0.046)	-0.074 (0.049)	-0.069 (0.047)	-0.077 (0.078)	-0.071 (0.048)
Leased/sub-leased out portion when enterprise privatized	0.395** (0.161)	0.391** (0.160)	0.332* (0.170)	0.549** (0.252)	0.333** (0.169)
Office buildings on when enterprise privatized	0.059 (0.040)	0.070** (0.031)	0.052 (0.037)	0.061 (0.051)	0.060* (0.035)
Social assets on when enterprise privatized	-0.026 (0.040)	-0.022 (0.040)	-0.029 (0.037)	-0.04 (0.057)	-0.038 (0.035)
Stores exhibition halls on when enterprise privatized	0.031 (0.043)	0.020 (0.037)	0.024 (0.038)	0.085 (0.071)	0.020 (0.037)
(Log) full-time employees	0.043** (0.018)	0.049** (0.019)	0.043** (0.017)	0.036 (0.022)	0.039** (0.018)
(Log) years privatized	0.069 (0.057)	0.051 (0.068)	0.048 (0.061)	0.048 (0.090)	0.037 (0.061)
City size	0.020 (0.015)	0.025* (0.014)	0.030* (0.015)	-0.012 (0.051)	0.027* (0.016)
Sector controls	Yes	Yes	Yes	Yes	Yes
Commercial group, ownership and profitability controls	No	Yes	Yes	Yes	Yes
Regional characteristics	No	No	Yes	No	Yes
Regional fixed effects	No	No	No	Yes	No
Pseudo R2	.1719	.1985	.2214	.3212	.2054
Number of respondents	355	340	340	241	340

Notes: Probit models, marginal effects reported. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors, clustered at regional level in parentheses. The phrase “when enterprise privatized” refers to the enterprise’s capital stock not its primary production plot. For firms whose primary production plot was not used by (*i.e.*, “not on balance”) when its capital stock was privatized, this phrase “when enterprise privatized” refers to when the plot first came to be used by the firm. For instance, for a firm operating on a plot that was not on its balance when it was originally privatized, the variable “office buildings on when enterprise privatized” refers to whether or not there were office buildings on the plot *at the point in time that the firm began using the new plot*.

Table 4 Regional land index and regional land policy

	Officials' opposition a barrier to privatizing primary production plot (1–5 scale)			Has firm ever sold any land plot?		
	(1)	(2)	(3)	(4)	(5)	(6)
Regional (log) ratio of urban commercial-residential-industrial land owned by firms to that owned by state and municipalities	–0.381*** (0.131)	–0.453*** (0.133)	–0.483*** (0.160)	0.522*** (0.132)	0.560*** (0.142)	0.588*** (0.179)
Firm and plot controls	Yes	Yes	Yes	Yes	Yes	Yes
Commercial group, ownership and profitability controls	No	Yes	Yes	No	Yes	Yes
Other regional characteristics	No	No	Yes	No	No	Yes
N	167	164	164	312	300	300
Pseudo R2	0.2373	0.2840	0.2930	0.1611	0.1856	0.2086

Notes: Columns 1–3 ordered probit, columns 4–6 probit model. *** p<0.01, ** p<0.05, * p<0.1. Standard errors, clustered at regional level in parentheses. Firm and plot controls include all those used in Table 3 specifications. Columns 1–3 include an additional firm-specific control equal to sum of responses to seven other questions (also 1–5 scale) relating to barriers faced in privatizing plot: inadequate resources (difficulty accessing credit), unclear rules regulating purchases of land, process of assigning land to appropriate government level incomplete, high cost of completing documentation to purchase land, absence of documents confirming firm's right to plot, defining and agreeing on plot boundaries, unresolved disputes over plot boundaries.

Table 5 Tenure status and (sub-)leasing out portion of primary production plot (IV models)

	(1)	(2)	(3)
Plot owned privately	0.186** (0.077)	0.173** (0.087)	0.179 (0.112)
First stage: plot owned privately			
Regional (log) ratio of urban commercial-residential-industrial land owned by firms to that owned by state and municipalities	0.241*** (0.028)	0.228*** (0.030)	0.199*** (0.041)
Firm and plot controls	Yes	Yes	Yes
Commercial group, ownership and profitability controls	No	Yes	Yes
Regional characteristics	No	No	Yes
Number of respondents	355	340	340

Notes. Instrumental variable model is a bivariate probit. Marginal effects are calculated using STATA's margins command. *** p<0.01, ** p<0.05, * p<0.1.

Table 6 Demand channel

	(1)	(2)	(3)
Plot owned privately	0.134*** (0.057)	0.113** (0.051)	0.091* (0.050)
Located in city center	0.099 (0.068)	0.105* (0.058)	0.0080 (0.055)
Plot owned privately x located in city center	-0.035 (0.068)	-0.030 (0.062)	-0.014 (0.065)
Firm and plot controls	Yes	Yes	Yes
Commercial group, ownership and profitability controls	No	Yes	Yes
Regional characteristics	No	No	Yes
Pseudo R2	0.1729	0.1992	0.2215
Number of observations	355	340	340

Notes: Probit models. Marginal effects are reported, calculated using Stata's margins command. The marginal effect reported for the interaction term is the difference (over being located in the city center) in the difference (over owning or planning to own private title) in predicted probabilities of renting out the firm's primary production plot. Robust standard errors, adjusted for clustering at regional level in parentheses. ***, **, * significant at 1%, 5% or 10% levels, respectively.

Table 7 Supply channel

	Move production		Move production on own initiative	
	(1)	(2)	(3)	(4)
Plot owned privately	0.000 (0.015)	-0.025 (0.036)	0.011 (0.007)	-0.041 (0.026)
Located in city center	0.023 (0.020)	-0.004 (0.038)	0.012 (0.012)	-0.053*** (0.016)
Plot owned privately x located in city center		0.056 (0.077)		0.139*** (0.041)
Firm and plot controls	Yes	Yes	Yes	Yes
Pseudo R2	0.1112	0.1149	0.1542	0.1885
Number of observations	356	356	325	325

Notes: Probit models. Marginal effects are reported, calculated using Stata's margins command. The marginal effect reported for the interaction term is the difference (over being located in the city center) in the difference (over owning or planning to own private title) in predicted probabilities of the dependent variable equaling one. Robust standard errors, adjusted for clustering at regional level in parentheses. ***, **, * significant at 1%, 5% or 10% levels, respectively.

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