

# Russian Serfdom, Emancipation, and Land Inequality: New Evidence

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**Note to Readers:** This long descriptive paper is part of an even larger project - "Serfdom, Emancipation, and Economic Development in Tsarist Russia" - that is very much a work in progress. As such, some obvious extensions are left out. I apologize for any inconsistencies that remain.

## Abstract

Serfdom is often viewed as a major institutional constraint on the economic development of Tsarist Russia, one that persisted well after emancipation occurred in 1861 through the ways that property rights were transferred to the peasantry. However, scholars have generally asserted this causal relationship with few facts in hand. This paper introduces a variety of newly collected data, covering European Russia at the district (*uezd*) level, to describe serfdom, emancipation, and the subsequent evolution of land holdings among the rural population into the 20<sup>th</sup> century. A series of simple empirical exercises describes several important ways that the institution of serfdom varied across European Russia; outlines how the emancipation reforms differentially affected the minority of privately owned serfs relative to the majority of other types of peasants; and connects these differences to long-run variation in land ownership, obligations, and inequality. The evidence explored in this paper constitutes the groundwork for considering the possible channels linking the demise of serfdom to Russia's slow pace of economic growth prior to the Bolshevik Revolution.

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“The year 1861 begot the year 1905.”<sup>2</sup>

## Introduction

Institutions matter for economic development.<sup>3</sup> In exploring this theme, scholars have turned to history, which offers the possibility of examining quasi “experimental” evidence of the consequences of different institutional arrangements for short and long run economic development (e.g. Acemoglu et al., 2002; Banerjee and Iyer, 2005; and Dell, 2010). One important strand of this growing literature investigates whether the institutional structure of slavery mattered for subsequent economic outcomes in Africa, the United States, and elsewhere (Acemoglu et al., 2012; Bertocchi and Dimicio, 2012; Engerman and Sokoloff, 2002; Miller, 2009; Nunn, 2008a, 2008b, and 2011). These studies have emphasized several possible channels of persistence, including inequality of human capital, property, or income. In this literature, it is not just the direct legacy of slavery that possibly influenced long-run outcomes, but it was also the manner by which the systems ended. Emancipation and related reforms played a key role in consolidating economic and political inequality and influencing the path of institutions and inequality in ways that either promoted or limited subsequent economic growth.

Can we understand the impact of Russian serfdom and emancipation in similar ways? The economic backwardness of Tsarist Russia has longed been blamed on absent or poorly functioning institutions: weak corporate law (Owen, 2002), the inefficiencies of communal land tenure (Gerschenkron, 1965), and the limited responsiveness of the political system (Nafziger, 2011), just to name a few. Perhaps most famously, numerous scholars have emphasized the negative implications of serfdom – a coercive system of labor control similar in some ways to American slavery – for Russian economic development from the 16<sup>th</sup> to the 19<sup>th</sup> centuries. Proposed mechanisms have included limitations on the mobility of serf labor, laws against serfs engaging in certain types of economic activity, restrictions on serf property ownership, prohibitions on formal schooling among serfs, and incentive effects and deadweight losses implied by different types of seigniorial obligations. In sum, these factors have been viewed as contributing towards the slow pace of agricultural growth and industrial expansion in Russia prior to serf emancipation in 1861.<sup>4</sup>

Furthermore, Gerschenkron (1965), Robinson ([1932] 1972), Lenin (see the quote above), and others argue that the manner by which the Russian peasantry was freed reinforced or even strengthened many of these constraints. In contrast to African Americans after U.S. slave emancipation, Russian peasants did receive title to land under their control in a complicated and drawn out process generally known as Redemption. However, these land reforms that accompanied emancipation were heterogeneous across European Russia and among different peasant groups, with former privately owned serfs receiving different settlements than peasants resident on state or crown lands. This variation in the ways that serfdom ended influenced the subsequent level and distribution of productive factors among the rural population (as we show below); and it may have also fostered persistent differences in human capital accumulation,

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<sup>2</sup> The quote is from an essay by Lenin (1911).

<sup>3</sup> By “institution,” I mean informal customs, behavioral norms, and culture, as well as formal laws, political entities, and corporate bodies – anything that affects incentives or enforces certain types of economic behavior (Greif, 2006).

<sup>4</sup> Speaking shortly after signing the Treaty of Paris that ended the Crimean War, Tsar Alexander II asserted that, “It is better to abolish serfdom from above than to await the day when it will begin to abolish itself from below” (quoted in Emmons, 1968, p. 41).

market development, and institutional development across Imperial Russia. Therefore, in considering the possible short and long run implications of serfdom for economic outcomes, it is vital to understand the variation not only in the coercive labor system itself, but also in how emancipation and land reforms differentially occurred across space and between different groups of peasants.

Although the literature on the origins, workings, and consequences of Russian serfdom and emancipation is voluminous, relatively little of this scholarship has been explicitly empirical. The dearth of adequate quantitative evidence is especially significant, because, as emphasized by Dennison (2011), Kolchin (1987), and others, the set of arrangements known as “serfdom” varied widely across space and over time. Conditions on even nearby estates were frequently quite different, and the processes of emancipation and land reform depended critically on an estate’s location, the property’s seigniorial rights and obligations, and characteristics of the local peasant population. Much of what we know about serfdom and the way it ended comes from case studies based on archival documentation for individual estates or small regions, or from the consideration of aggregate statistics.<sup>5</sup> The key contribution of this paper is to present a number of stylized facts describing the geography of serfdom prior to 1861, as well as differences in factor endowments and the distribution of property stemming from emancipation and the accompanying land reforms. Drawing on a new district-level dataset, this constitutes a much richer picture of the variation in serfdom and emancipation across European Russia than has previously been available. These data represent the first stage in the larger empirical project, which is to examine the ways that serfdom and its legacy did or did not matter for Russian economic development prior to the Revolutions of the 20<sup>th</sup> century.

To set the stage, the first section of the paper briefly summarizes the evolution of serfdom and discusses why this set of institutional arrangements may have impacted current and subsequent economic development. Using a variety of previously unexplored data, we then document several aspects of the variation in serfdom just prior to emancipation. First, not all Russian peasants were obligated to private landowners prior to 1861. Privately owned serfs (*krepost'nye liudi*) actually comprised a minority of the peasant population in European Russia by the 1850s, and tax census data allow us to describe the geography of this variation.<sup>6</sup> Second, we establish that there was considerable heterogeneity in the type and level of obligations imposed on serfs, and in the structure of estates. The majority of serfs were liable for some form of labor obligations, often in combination with cash or in-kind payments. In contrast to American slavery, the modal Russian serf resided on estates of well over 100 serfs. Finally, and as a first step towards establishing a possible causal framework for future research, we examine a simple set of correlates to document what might have driven the variation in the prevalence and characteristics of serfdom. We find several results consistent with the literature, particularly the concentric pattern away from Moscow, but we acknowledge the need for further work to ascertain the precise determinants of pre-1861 institutional variation.

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<sup>5</sup> There is a substantial quantitative Soviet literature on serfdom and emancipation (some of which we cite below), but these studies tended to be narrowly local or regional in focus and to present data in ways that fit into ideological constraints.

<sup>6</sup> Approximately 36% of peasant male souls (*dushi* – the primary tax unit) were serfs in 1858, while around 53% resided on state land and were administered by the Ministry of State Domains (Table 1; and Kabuzan, 1971, p. 176). The Tsar’s family held the remaining 5% as appanage (*udel'nye*) peasants. Their reform experience fell somewhere between that of the former serfs and the former state peasants.

In the second section of the paper, we explore the post-1861 differences in landholdings between formerly serf and non-serf areas, and between areas where serfdom took different forms. We detail how emancipation began a process of transferring a significantly revised set of property rights (compared to their previous holdings) to the newly freed serfs, but the amount of this “allotment” land and the associated payments required under the “redemption” process varied geographically and depended on initial conditions. Moreover, reforms of the 1860s affected all members of the peasant *soslovie*, or social class, and not just those who were formally obligated to the nobility as serfs. We provide evidence that the (greater) allotments received by the state peasantry after carried a lower redemption cost than those of the former serfs well after the 1860s.<sup>7</sup> We also document other variation in property endowments established in the wake of emancipation and redemption, including the extent of “communal” holdings, the amount of non-allotment land acquired by peasants, the resulting inequality of land ownership, and the corresponding level of payments and property taxes imposed on land. Going further, a series of simple econometric exercises help us document the connections between serfdom, its reform process, and subsequent variation in factor prices and land endowments in the Russian countryside. A key finding of this empirical work is the persistence of different types of land inequality: of communal allotments among the peasantry, of holding sizes and characteristics between social classes, and across broad categories of property rights. However, and in contrast with much of the literature, we find little connection between former serf status and the ability to fulfill land or tax obligations in subsequent decades.

The next stage of the broader research project will focus more explicitly on the empirical relationship between serfdom, subsequent land holdings and inequality, and other development outcomes in the late Tsarist period. Obviously, such an analysis faces a significant hurdle: there were surely unobservable reasons why both land inequality and serfdom (and the reforms of the 1860s) varied across space in the ways that they did. In other contexts, Acemoglu et al. (2012), Dell (2010), Miller (2009), and others have employed arguably exogenous sources of variation in slavery (or in the conditions of emancipation) to study the long-run implications for economic development. Other work tries to connect property inequality to the political economy of public good provision, financial development, and other outcomes in less developed economies (Cinnirella and Hornung, 2011; Engerman and Sokoloff, 2002; Galor et al., 2009). Given that one of our main findings in this paper is that rural inequality in late-Tsarist Russia was linked to the legacies of serfdom and emancipation, we feel that investigations of the roots of underdevelopment in this context demand a unified approach towards understanding the interrelationships among these factors. We can only suggest some tentative possibilities in this direction in the concluding section, based on our initial examination of the underlying determinants of “serfdom” and “inequality” in the first two sections of the paper.<sup>8</sup>

## **1: Russian Serfdom: History, Conceptual Framework, and Empirical Evidence**

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<sup>7</sup> In addition, various institutional differences between the types of peasants may have been institutionalized in the reforms of the 1860s. See below.

<sup>8</sup> In the spirit of Bertocchi and Dimico (2012), Nunn (2008b), and Summerhill (2010), we have undertaken a series of simple (and, admittedly, only suggestive) regression “horse races” between various measures of serfdom, inequality, and outcomes. These preliminary quantitative exercises do find spatial differences in several development indicators that can be linked to variation in serfdom or to property inequality. However, we find little evidence for a broad-based negative development impact of serfdom in the medium-run. Ongoing data collection aims to incorporate arguably exogenous geographic determinants of both serfdom and inequality into this empirical framework.

The longstanding view of Russian serfdom is that the institution emerged in the 16<sup>th</sup> and 17<sup>th</sup> centuries as a solution to the problem of scarce labor and widely available land. In return for service – military or otherwise – the Tsars and other higher ranked land-owning nobility granted land to favored individuals. Making these grants productive required labor, but the mobility of the peasantry initially made it difficult to ensure a labor force. Thus, a series of decrees slowly circumscribed the mobility of peasants who were resident on such holdings while also making other aspects of their lives increasingly subject to control by the class of servitors. In part, this built on a long tradition of Russian debt and hereditary slavery (*rabstvo* or *kholopstvo*).<sup>9</sup> The legal code (*Ulozhenie*) of 1649 capped this process, which was followed over the next century by measures that transformed the servitor population into a full-fledged noble estate with rights and privileges that extended over their peasant population. These steps consolidated serfdom as an institution that would become synonymous with rural Russian society by the 18<sup>th</sup> century.<sup>10</sup> Therefore, the distribution of serf estates was quite likely driven by the path of Muscovite expansion and the related – and possibly geographically idiosyncratic – process of land allocation to the servitor class. We return to this possibility below.

The rights of serf-owners included various forms of seigniorial rents and obligations, along with control over many aspects of their peasants' lives. This was especially true after Catherine II issued the Charter of the Nobility in 1785, which ended obligatory state service for the nobility and granted them broad authority on their own estates. Seigniorial extractions either took the form of cash or in-kind payments, or were demanded as labor on the *demesne*. In the northern and central provinces around Moscow, poor soil and climate conditions eventually led estate owners to allow many of their serfs the freedom to turn to non-agricultural occupations (often off the estate) to generate income and pay their tax and seigniorial obligations in cash or kind. Estate lands in such areas were often granted in their entirety to the serfs to do with as they wished, as long as they paid their *obrok*, or quit rent, and fulfilled other obligations.<sup>11</sup> As a result, these payments often came to represent a tax on serf labor income, rather than some version of Ricardian land rents. In contrast, the provinces to the south and west, where soil and weather conditions favored commercial agriculture, have long been characterized by the presence of substantial estate *demesnes*. In this region, serf obligations frequently included labor services for a particular number of days or for certain agricultural tasks, with the assessed amount dictated largely by the level of labor productivity in agriculture. In such areas, most notably described by Steven Hoch in a series of works, the landowner or his appointed manager was much more

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<sup>9</sup> Slaves likely constituted less than 10 percent of the Muscovite population in the early 17<sup>th</sup> century. Agricultural slaves were converted to serfs by decree in 1679. During reforms installing a poll-tax system in the early 1720s, Peter the Great transferred any remaining slaves to household serf status (Hellie, 1982).

<sup>10</sup> See Blum (1961), Hellie (1971), and Robinson (1972). Hellie provides a detailed account of the rise of serfdom as the outcome of increasingly expensive military developments. As Wirtschafter (1998) emphasizes, the ownership of serfs was restricted to the noble estate after the mid-18<sup>th</sup> century, although cases of illegal ownership by other classes are evident emancipation. Subject to some constraints, non-nobles could hire serfs directly or via their owners.

<sup>11</sup> Many serfs and state peasants in the region engaged in small-scale trading or proto-industrial activities (Bohac, 1989; Dennison, 2011; and Fedorov, 1974). Serf-owners frequently granted travel passes that allowed their peasants to migrate for urban or factory-based employment (ibid.; Gorshkov, 2000; Melton, 1987; Rudolph, 1985; and Tugan-Baranovsky, 1907 [1970], Part 1). This could involve wage work in capital-intensive, modern factories founded by serf entrepreneurs themselves. In other cases, serf-owners moved their peasants to work in their own enterprises off the estate (e.g. Bohac, 1989). The Moscow region became widely known for textile production, with peasants often foregoing agriculture entirely to concentrate on home or factory-based spinning and weaving (Vodarksii, 1972). In the Urals, most of the serfs were directly obligated to work in mining and industrial enterprises and received access to some land in exchange.

directly involved in managing the economic activities of his or her serfs.<sup>12</sup> These were the estates underlying Domar's (1970) model of serfdom as a solution to a (agricultural) labor scarcity problem.

The strengthening of serfdom in the 18th and 19th centuries was matched by the emergence of the peasant commune – the *mir* or *obshchina* – as a key institution in rural Russian society.<sup>13</sup> On serf estates, the commune organized agricultural production, allocated seigniorial obligations, and managed property granted to the peasants by the owner. Such coordination occurred under the open-field system of mixed grain and livestock farming that prevailed through the 19th-century Russia (Moon, 1999, pp. 122-126; and Pavlovsky, 1968). At the same time, local administrative and judicial tasks were often informally devolved to the commune and managed by elected communal elders or the assembly of household heads (the *skhod*). Communal control was also necessitated by substantial landlord absenteeism and the immense size of some estates (Blum, 1977). Authors such as Hoch (1986) have emphasized that even on estates with more direct landlord management, there was a close relationship between communal and seigniorial authorities. Besides seigniorial duties, the commune came to be responsible for the fulfillment of other state obligations that were collectively imposed on the households of the community. This collective responsibility, or *krugovaia poruka*, for external obligations came to be a defining feature of rural Russia well after serfdom ended.<sup>14</sup>

By definition, serfdom entailed constraints on the mobility and the economic decision-making of peasants. Soviet scholars often bent over backwards trying to prove that serfdom was in crisis before 1861 (e.g. Koval'chenko, 1959), but more careful studies employing simple microeconomic theory and some limited empirical sources have found that it likely remained profitable until the very end (Domar and Machina, 1984). Indeed, the evident mobility of peasants under serfdom suggests that this institutional structure did not prevent engagement in many forms of commerce, artisanal work, or industrial labor. Moreover, evidence presented by Tracy Dennison (2011) suggests that in the absence of much local state activity, large estate owners found it profitable to provide private legal structures, limited public goods, and a relatively light hand when it came to internal governance. Relative to areas or villages without such institutional structures (i.e. among the state peasantry – see below), such well-organized estates may have even generated environments conducive to economic development. The work by Dennison on an estate from northern Russia contrasts with the relatively pessimistic view of institutional arrangements found by Hoch in the black-earth region he studies, where seigniorial interests tended to center on the exploitation of serf labor in agriculture. Indeed, the main theme that emerges from the case-study and region-specific historical literature is the exceptional estate-to-estate variation in what serfdom entailed across European Russia.

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<sup>12</sup> See Hoch (1986). As popularized in many works of classic Russian literature, this could result in corporal punishments or interference in the personal lives of serfs by their masters.

<sup>13</sup> Prior to the 18th century, peasants did live in communities that engaged in some collective management of property and fulfillment of obligations to the state and the nobility. Descriptions of the commune under serfdom can be found in Aleksandrov (1976), Bartlett, ed. (1990), Dennison (2011), Hoch (1986), and Pushkarev (1976).

<sup>14</sup> The communal form of peasant society was reinforced by the soul tax initiated under Peter the Great in the 1720s and lasting until 1886. This was *collectively* imposed on an estate's serfs and on each state peasant settlement. Revisions of the payment amounts occurred through a series of ten tax censuses, with the last occurring in 1857-58. For more on the tax censuses, or revisions, see Hoch and Augustine (1979).

As we have noted, privately owned serfs were not the only type of peasants in European Russia by the middle of the 19<sup>th</sup> century. Several factors contributed to the emergence of a heterogeneous peasantry residing on land formally controlled by the state (*gosudarstvennye krest'iane*), rather than private landowners: the tradition of granting land in return for service slowed over the 18<sup>th</sup> century, leaving many peasants on un-allocated state property; in the 1760s, the state took over all lands owned by the Orthodox Church; and continued expansion of the state to the south and southwest opened up new areas for the migration of independent farmers (or run-away serfs).<sup>15</sup> In many provinces, including central ones such as Moscow, state peasant communities existed alongside serf villages and managed land and obligations (tax and land-use payments) communally in much the same manner as the seigniorial peasants did. According to some accounts, the agricultural techniques of the seigniorial and state peasants were remarkably similar, despite some efforts by the Ministry of State Domains to improve the techniques of the state peasants before 1861 (Deal, 1981; and Ivanov, 1945, p. 128).<sup>16</sup> Moreover, the ethnicities, religious identification, and customary practices of these different peasantries tended to be quite similar in a given region.

Other evidence suggests that the economic conditions of state peasant villages did differ from those of the serfs before the reforms, with serfs possibly more specialized in agriculture and less able to take advantage of off-estate opportunities.<sup>17</sup> In addition to the state poll tax (the famous soul tax), military recruitment levies, and other local in-kind and labor service obligations, all of which were also imposed on serfs, state peasants were liable for rental payments for the land they occupied (*obrochnye podati*). However, when compared to serfs, many authors argue that state peasants faced lower levels of obligations that were more closely tied to the value of their land holdings, they could more easily engage in contracts (labor, land, or otherwise), and they had stronger traditions of individualized property rights (Crisp, 1976; Deal, 1981; and Ivanov, 1945).<sup>18</sup> Constraints on labor market decisions may have also been lower among the state

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<sup>15</sup> The origins of the state peasantry varied across the Empire. In Moscow province, the former state peasants were primarily descendants of serfs who passed to state stewardship when Catherine the Great expropriated the church lands in 1764 (Kabuzan, 1988, p. 76). Descendants of such peasants were known as “economic peasants,” although their administration fell under the Ministry of State Domains by the early 19<sup>th</sup> century. In southern provinces, many state peasants were initially independent soldier-farmers. In more peripheral areas, the state peasants simply resided on land that was never allocated to state servitors. The peasant estate, or *soslovie*, was comprised of serfs, state peasants, court or court peasants (residing on land owned by the Romanov family), foreign colonists, Cossacks, discharged military conscripts, and various specially recognized ethnic nomadic and sedentary populations. Each of these groups (and, indeed, the different types of state peasants) possessed distinct legal rights and fiscal obligations, but in the current version of the paper, we subsume much of the variation in the peasant estate to simple serf / non-serf or serf / state peasant breakdowns.

<sup>16</sup> The Ministry of State Domains was created in reforms of the 1830s under P. D. Kiselev. A similar overarching administration emerged for the land owned by the Tsar’s family (the *udel’* or *appanage*) in the early 19<sup>th</sup> century.

<sup>17</sup> According to Mironov, serfs had 6-7% higher output per acre than state peasants in the 1850s (1996, p. 324). Deal (1981, p. 111) compares a random sample of serf estates and state peasant villages in Kharkov province and finds that serfs had higher per capita output on their allotment land in the 1850s. According to the findings in Dennison (2011) and Nafziger (2012b), this may have reflected the forced “over-allocation” of serf labor on their allotted land.

<sup>18</sup> State peasants were granted the possibility of owning land in their own name far earlier than the seigniorial peasants (1801 versus 1848). They could enter contracts, own and inherit land, and freely engage in non-agricultural work without the approval of seigniorial officials (Blum, 1961, pp. 485-488). Measures throughout the 18<sup>th</sup> and early 19<sup>th</sup> century – especially the reforms of Kiselev in the 1830s and 1840s – aimed to regulate the payments required from state peasants and correlate them more closely to land quality and ability to pay (Moon, 2001, pp. 46-47). According to Deal’s account of these reforms in Kharkov province in the 1840s and 1850s, this resulted in the equalization of payment obligations between villages, with consideration of differences in net income (1981, pp. 162-163). The absence of any coercive extraction of rents by a private landowner meant that state peasant

peasants. By the 1850s, over 90% of male state peasants in Moscow province were involved in some type of non-agricultural activity (Ivanov, 1945, p. 103). Across the central provinces, this tendency was generally higher among state peasants than among serfs, who, according to data from the 1850s on the granting of passports to work outside of the village, were significantly less likely to be issued such documents.<sup>19</sup> Moreover, specific efforts by the Ministry of State Domains to encourage school investments, grain stores, and new institutions of peasant self-government (formalizing existing communal structures) led to differences in institutional structures and the provision of public goods by the time of emancipation (Druzhinin, 1946 and 1958; and Nafziger, 2012b).

Regions and villages characterized by the greater prevalence or different forms of private serfdom may have seen significant economic differences by 1861. These may have arisen from variation in factor endowments (and the level of associated obligations), the relative accessibility of higher returns in on or off-farm labor, the local provision of public goods, or various types of institutional characteristics. Furthermore, even apart from the direct impact of peasant emancipation and land reform on factor endowments (including land inequality), persistent institutional and other differences may have generated negative effects for economic outcomes that persisted after serfdom ended. Before considering the subsequent variation in factor endowments and related payment burdens, we undertake a detailed quantitative accounting of serfdom across European Russia prior to 1861.

### 1.1 Quantitative Evidence on Serfdom Prior to Emancipation

Perhaps surprisingly, the variation in serfdom is not well documented empirically. Much of the literature on serfdom relies on legal decrees or qualitative accounts. Soviet scholars were very interested in quantification, but their evidence was often limited to a few estates, small geographic areas, or aggregate figures (e.g. Koval'chenko, 1959; Liashchenko, 1949). Depictions in the western historiography tend to focus on broad provincial or regional comparisons (e.g. Moon, 2001) or consider evidence from case studies (Dennison, 2011; Hoch, 1986). Many researchers have relied on summary statistics drawn from the ten tax censuses, or revisions, conducted between 1720 and 1860 as the primary source of data on the extent of serfdom. Here, we draw on *disaggregated* totals from the last of these tax censuses and from a number of other relatively underutilized sources to provide a brief comparative snapshot of what serfdom looked like at the district level in the late 1850s. Where possible, we also consider dynamic evidence on serfdom in the century leading up to emancipation, although our primary focus is on documenting the institution just prior to 1861.

*[Insert Table 1 about here]*

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communities likely faced lower net obligations before 1861 (Ianson, 1881, and Robinson, 1972, p. 90). Finally, the granting of migration passports by the Ministry of State Domains was relatively standardized, and the number increased substantially before 1861 in Moscow province (Ivanov, 1945, p. 108). Conditions of the court peasants generally lay between those facing serfs and state peasants.

<sup>19</sup> The difference between the two groups in the share of males issued such passports was on the order of ten percentage points in the provinces surrounding Moscow (Fedorov, 1974, pp. 206-7). Crisp notes that, "The better opportunities for earning and the relatively low rents of the state peasants gave them greater possibilities of accumulating capital" (1976, p. 93). Ivanov (1945, p. 104) quotes an 1851 newspaper article commenting on Zvenigorod and Dmitrov districts in Moscow province, "grain cultivation is primarily practiced by serfs...[state peasants] primarily live and work as hired labor in factories in cities or have some kind of craft production in the home."

According to the 10<sup>th</sup> tax revision of 1857-1858 (Tables 1 and 2), the districts of European Russia (in 50 provinces, minus Poland and Finland) contained approximately 22 million privately held serfs out of a population of just over 60 million (approximately 36.4 percent). Roughly 92.5 percent of districts (458 out of 495 with data) contained some serfs, although their share of the total population exceeded 80 percent in only 7 and many districts had a negligible number (Figure 1a). The provincial trends from the second tax census to the tenth are presented in Appendix Table 2. The serf share of the total population was somewhat lower than earlier in the 19<sup>th</sup> century (approximately 50 percent in 1811), as manumissions, transfers of indebted estates to state ownership, and differential population growth by region all served to reduce the serf population relative to other groups of peasants (Hoch and Augustine, 1979). While more recently settled southern areas saw rising shares of serfs (sometimes as northern estate owners transferred their peasants to new holding), most of the densely populated central provinces experienced a relative decline in serfdom – as a share of the total population – from the late 18<sup>th</sup> century onwards.

*[Insert Table 2 about here]*

By the late 1850s, the geographic distribution of serfs was concentrated in a band from Kiev to the upper Volga (Figure 1b).<sup>20</sup> Yet, there was considerable variation in the prevalence of serfdom at the district and the village levels (Deal, 1981; and Nafziger, 2012b). For example, the provinces of Kazan on the upper Volga, Kherson on the Black Sea, and Kostroma to the north of Moscow saw variation of forty percent or more across districts in the shares of the population who were serfs. Only a small of this was driven by variation in (the low levels of) urbanization, or the presence of other social classes; rather, differences in the prevalence of serfdom were primarily due to the location of the non-serf peasantry.<sup>21</sup>

*[Insert Figures 1a and 1b about here]*

According to information reported by provincial committees of the nobility to the central Editorial Commissions, which prepared the emancipation reforms in 1858-60, the share of serfs (male souls) obligated for cash or in-kind quit-rents alone was 25.7 percent (Tables 1 and 2).<sup>22</sup> The rest were required to perform at least some form of labor services, which may have included working in estate-owned enterprises (including natural resource extraction), tasks such as carting goods to market or cutting firewood, or various types of agricultural work on the *demesne*. The share of serfs engaged as domestic servants or artisans on the estate – a group known as “household” serfs, in contrast to “field” or “peasant” serfs – comprised around 6.7 percent of the

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<sup>20</sup> The map in Figure 1b represents one of the first geo-referenced district-level maps of European Russia from the late Tsarist era. The underlying shape files are available upon request. Liashchenko (1949) provides maps similar to Figures 1b and 2, but based on provincial data only. There were some serfs in Siberia and Transcaucasia (Troinitskii,

<sup>21</sup> We are engaged in ongoing work with rare compiled returns to the 10<sup>th</sup> tax census that should allow us to better describe the non-serf populations in each district.

<sup>22</sup> To our knowledge, these data (reported in Skebnitskii, ed., 1865/66) have only been briefly explored in existing scholarship. There is some possibility of reporting bias in these data, as it may have been in the nobility’s interests to overstate their level of *obrok* (or to misrepresent their employment of *barshchina*) if they viewed their compensation in the emancipation’s land reforms to be potentially linked to obligation levels (Moon, 1999, p. 76). Although these expectations proved partially true in the final statutes (albeit in complicated ways), the resulting extent of possible misreporting remains unknown. Emmons (1968) provides a useful account of the Editorial Commissions’ work.

total serf population. This category of serfs received no access to land in the emancipation reforms.

Well over 50 percent of serfs were obligated for some amount of labor directly on the *demesne* or in enterprises run by the serf owner, such as sugar processing on Ukrainian estates. Those serfs that paid quit-rent in some form were liable for seigniorial obligations, at least according to the data reported by the nobility themselves, of over 25 rubles per *tiagla*, a labor unit typically defined as a husband and wife team (Table 2). As Figure 2 indicates, *obrok*-only obligations were more common among the serfs of the agriculturally less productive provinces of the north and central regions. However, not only was there considerable variation in obligations even in heavily quit-rent provinces like Iaroslavl', but a significant number of estate owners enforced a mixed (*smeshanye*) set of payment and service obligations on their serfs.<sup>23</sup>

[Insert Figure 2 about here]

It worth considering the extent to which these obligation levels were large or growing, especially in comparison to the non-serf peasantry's tax and land payments. According to Koval'chenko (1959) and other Soviet scholars, the nominal level of burdens was increasing in the early 19<sup>th</sup> century, even as incomes themselves were rising slowly. The result was a relatively steady soul tax/*obrok* burden of 20-30 percent of serf household income.<sup>24</sup> Fedorov (1974, p. 329) argues that payments were increasingly tied to a household's income level, although Dennison (2011) finds that the allocation of obligations was often regressive. Most available data on *barshchina* points towards a norm of three days per week (under what was known as Paul's Law, named for a decree issued by Paul I in 1797), although this could just reflect reporting bias, and there was evident variation around this number, including estate owners requiring up to six days in seasons of high labor demand.

Overall, the available evidence suggests that average serf quit rent payments were more varied and generally exceeded those paid by the state peasantry by the late 1850s. Druzhinin (1958, vol. 2, p. 133) notes that serf *obrok* obligations per male were 3-6 times what was paid by state peasants in the same provinces (roughly 8 versus 2 silver rubles) in the late 1850s. Moreover, following the reforms of the state peasantry in the 1840s and 1850s, there was much less heterogeneity in payment amounts among state peasants within a province.<sup>25</sup> Druzhinin (*ibid.*, p. 146) also finds that *obrok* and soul tax payments comprised between 7 (Pskov) and 20 (Kursk)

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<sup>23</sup> Leonard (1989) and many local Soviet studies document the varied nature of obligations within particular provinces or districts in the decades prior to 1861. Where returns to labor in non-agricultural pursuits were relatively high, serfs could often pay other serfs to fulfill any required labor obligations (e.g. Fedorov, 1974, p. 324-5).

<sup>24</sup> The soul tax was a state head tax that urban populations, non-serf peasant communities, and serf owners (for their serfs) were liable for. This range of payment obligations reflects estimates of Koval'chenko and Milov (1966), Ryndziunskii (1966), and others. These scholars drew on estate level documents of local trends in *obrok*. Fedorov (1974) and other scholars working with such micro-data argue that even a constant relative *obrok* assessment was becoming more burdensome, as observed arrears were rising, although many others factors could explain such a trend. Although Soviet scholars also concluded that labor obligations were rising on *barshchina* estates, we are aware of no quantitative information in support of this possibility. Many scholars (i.e. Fedorov, 1974) also argued that a general trend towards *obrok* and away from *barshchina* reflected growing exploitation, although the evidence that this was even true in general is also relatively weak.

<sup>25</sup> Druzhinin compiled his state peasant payment (*obrok*) information from yearly accounts kept by the Ministry of State Domains. He compares these numbers to the same data on serf *obrok* levels that we present in Table 2. Our estimate of 25 rubles per *tiaglo* is broadly consistent with his 7-11 rubles per male soul once the additional worker and capital often provided by serfs are taken into account.

percent of mean household income among the state peasantry. More work remains to be done on documenting the level, trend, and variation in serf obligations prior to emancipation, especially in real terms, but it appears likely that state peasants faced lower levels of extraction prior to 1861, all things equal.

In addition to (and perhaps underlying) the summary data collected by the Editorial Commission, most of the provincial committees of the nobility compiled self-reported estate-level information for the largest holdings in each district.<sup>26</sup> These data may suffer from some selection and reporting biases, including the underreporting of estate size in an attempt to avoid property losses to the soon-to-be emancipated serfs. With this concern in mind, these data do suggest that roughly 65 percent of serfs resided on such large estates, where the average estate size was approximately 334 male souls (Table 2). This large mean estate size represents one significant difference between Russian serfdom and American slavery (Kolchin, 1987). The data coverage is incomplete (several provinces are missing), but the mean large estate size appears to be relatively evenly distributed across provinces, with a slight west to east gradient (see Appendix Figure 1).<sup>27</sup> The share of serfs on large estates who were on quit-rent only (here, measured in terms of *tiagla*), or who worked in the owner's household, was only slightly less than for all serf estates.

Although a number of scholars have remarked on the especially poor conditions faced by residents on very small estates, the available district-level data provide no information on these serfs.<sup>28</sup> Provincial-level data from the 10<sup>th</sup> tax census, published by the Ministry of Internal Affairs, show that approximately 80 percent of serf owners owned estates of less than 100 male serfs, but such estates held less than 20 percent of serfs. The prevalence of such small estates varied across European Russia: they held less than 5 percent of serfs in Kiev, Perm, and Podol'sk, but over 30 percent in high serf provinces such as Novgorod, Pskov, and Poltava.<sup>29</sup>

Finally, the summary data reported to the Editorial Commission also included limited information on the amount of land allotted to serfs on estates, as well as comparable information on mean holdings of peasants obligated to the state or directly to the Tsar's family. Although 458

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<sup>26</sup> Information was supposed to be collected on all estates with more than 100 male souls, but our work with the published returns shows some smaller estates were included. Such "small" estates were included in the summary statistics of Table 2, as the exact criteria for their inclusion in the published source was not indicated. The large estate data were not reported for several provinces noted under Table 2. It appears that the large estate data served as a key input into the compiled district summary statistics published in Skebnitskii, ed. (1865/66), but based on spot checks, the numbers do not exactly match up in most cases.

<sup>27</sup> The especially large serf estates in the northeastern province of Perm were enormous mining concerns. While we know the total number of serfs by district, we do not have the underlying number of small estates to calculate total mean estate size. Note that the mean size of large estates was only marginally correlated with the share of serfs on such estates (0.22). This implies that relatively few mostly serf districts were characterized by very large holdings. Rather, many high serf prevalence districts exhibited a large number of medium size estates. As Table 2 notes, the Gini coefficient (of the number of male serfs) on large estates was not terribly high at 0.42.

<sup>28</sup> In her study of a quit-rent estate in Iaroslavl' province, Dennison (2011) acknowledges that her findings of a somewhat supportive institutional environment for economic development may be driven by the large size of the estate (one held by the largest serf owning family in Russia), especially when it came to its administrative and judicial structures. In her study of a nearby district, Leonard (1989) finds little substantive difference in yields or livestock per capita on small versus larger estates in the 1850s. On the issues facing serfs on small estates, see Robinson (1932 [1972]).

<sup>29</sup> We take these data from Troinitskii (1858). "High Serf" provinces are those where serfs were more than 30 percent of the population. The difference between these data and the greater role of small estates suggested by the large estate data is likely due to missing data in the latter source and the ownership of multiple small estates by single owners (aggregated in the former).

districts had some serfs according to the 10<sup>th</sup> tax census, serfs received substantive allotments (greater than 0.1 *desiatina*, or 0.27 acres) in only 387 of the 424 that provided these data, with a mean allotment of 3.33 *desiatina* per soul. In the reporting districts, serf estates possessed approximately 13.8 *desiatina* per soul in total. Therefore, on average, serf allotments were less than 1/3 of estate land prior to emancipation. Moreover, the average serf allotment was significantly smaller than the amount of land available to either the court or state peasants, although a large number of the latter group resided in more sparsely settled northern and eastern provinces. This gap in the relative size of serf and non-serf landholdings persisted well after serfdom – the bottom of Table 2 shows this utilizing data from 1905 (also see Appendix Tables 3 and 4). We return to this difference below.

## 1.2 Exploring the Variation in Serfdom

In laying the groundwork for an analysis of the associations between serfdom, (land) inequality, and economic development, we must first understand the factors behind the geographic distribution of serfs and the variation in what serfdom constituted. A number of theoretical, historical, and geographic explanations have been offered for why serfdom existed in the form it did, in the places that it did. We investigate a few of these in this section, but data limitations – particularly regarding underlying geo-climatic factors – constrain our efforts at this stage.

In reflecting upon the Russian experience, Domar (1970) famously treated serfdom as the product of a high land-labor ratio and the state’s willingness to impose mobility restrictions on the peasant labor force to support the landed elite. Following earlier historians who had made similar arguments, Domar emphasized that in the context of an elastic supply of land, the Russian state’s policies allowed the emerging nobility to extract the shadow (labor) scarcity rents from the land they owned. A similar logic forms the basis of more complicated dynamic models of slavery in land abundant societies, such as Lagerlof (2009) or Fenske (2010). One implication many have drawn from Domar’s model is that coercive labor systems may be more prominent in especially land-rich/labor-poor societies, conditional on agricultural productivity. This is not the only reason Domar cites for the emergence of serfdom in Russia, but it is one that we may be able to examine with the data at hand.

*[Insert Figure 3 about here]*

Relying on population data from tax records in the early 1860s, Figure 3 plots the district-level relationship between population density and the portion of the population who were serfs in the late 1850s (a similar picture emerges if the urban population is excluded). It shows a positive relationship, suggesting little support for a simplistic view of Domar’s broader argument about the serfdom taking hold in especially *land-abundant* areas.<sup>30</sup> Of course, it is likely that those districts with more productive land and, hence, higher population densities, were those where relatively more land was *endogenously* granted to servitors during the consolidation of serfdom. Furthermore, many serfs were not engaged in agricultural production as a primary occupation by the middle of the 19<sup>th</sup> century. Figure 4 plots the relationship between the share of serfs

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<sup>30</sup> It does not matter how we specify land abundance; the picture remains the same. This positive correlation may reflect the nature of serfdom as an institutional framework that was a response, in part, to efforts by some nobility to lure peasants away from estates in other locations prior to 1649. If nobility were especially successful in persuading mobility to those areas with relatively high returns to agricultural labor, than Figure 3 may simply reflect differences in the quality of land. See below.

exclusively on quit-rents and both population density and the overall population share of serfs. The relationship is only marginally and negatively related to population density, which is again inconsistent with a simple version of Domar's interpretation of agricultural serfdom. Serf owners of the mid-19<sup>th</sup> century were generally willing to let their serfs work in non-agricultural trades as long as their obligations were fulfilled.<sup>31</sup>

*[Insert Figure 4 about here]*

Table 3 presents results from simple OLS regressions that extend the pictures of Figures 3 and 4.<sup>32</sup> In the first three columns, the dependent variable is the share of the population that was serf in 1858; in the last four columns, it is the share of the serf population on *obrok* only. As a (overly) simple way to evaluate the central component of Domar's hypothesis, we include population density in 1858. Although not significant in the first basic model, the coefficient is negative and strongly statistically significant in the 2<sup>nd</sup> and 3<sup>rd</sup> models with province fixed effects. Thus, once fixed geographic differences are at least partly taken into account, we find what might be viewed as evidence for simplistic version of Domar's model. However, it is highly unlikely that these results signify causality due to the particular ways by which serfdom came to be. Obviously, those areas where the peasantry found it worthwhile to settle were almost certainly attractive to the emerging nobility.

*[Insert Table 3 about here]*

The historiography of serfdom connects its evolution to the process of political and military expansion of Muscovy from the 15<sup>th</sup> century onwards. In return for military and other forms of state service (and to help fund their ability to provide service at all), Tsars granted populated land to mounted cavalry and artillerymen (Hellie, 1971). The tightening restrictions on the mobility and rights of the peasant population over the subsequent centuries (culminating with the *Ulozhenie* of 1649) came in response to demands from this servitor class as it transitioned into a landowning gentry. Therefore, the role of labor scarcity, while possibly important to serfdom's consolidation and persistence *in general*, may have had a relatively minor role in explaining exactly where the system existed or what form it took. Supporting the notion that serfdom in the Russian case was an outcome of Muscovite expansion, columns 1 and 2 show that relatively less of the population was serf the further one went from Moscow (even *within* provinces). Land was more likely to be granted to the nobility the closer it was to Moscow, with more peripheral areas being relatively undesirable and only incorporated into the Empire late in the 18<sup>th</sup> or 19<sup>th</sup> centuries (and relatively sparsely populated before that).<sup>33</sup> As something of a placebo test, this

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<sup>31</sup> Dennison (2011) notes that the serfs on her estate (Voshchashnikovo in Yaroslavl' province) were forced to farm their relatively unproductive land or suffer fines. It is unclear how common such a rule was, but one side benefit from the estate-owner's perspective was some assurance about the subsistence – and, therefore, payment ability – of their serfs.

<sup>32</sup> The regressions are all simple linear models with or without province fixed effects and with robust and clustered by province standard errors. Districts with less than 1% serf population are dropped from the analysis. Note that the pair-wise correlations among these variables are provided below Table 3, along with an explanatory note regarding how they were constructed. The latitude and longitude variables and the distance from Moscow were all individually correlated with the two outcome variables.

<sup>33</sup> Some large landowners did move serfs from the central provinces to newly acquired steppe estates in the late 18<sup>th</sup> and early 19<sup>th</sup> centuries. Note that the inclusion of provincial fixed effects partially picks up differences in the timing of a region's incorporation into the Empire. In future versions, we hope to utilize historical waterways as another control for the direction of Muscovy and serfdom's expansion.

distance effect is not present in the models of share of serfs on quit-rent when province fixed effects are added.

The value of land, the productivity of the immobile serfs upon it (or in location-specific activities), and, perhaps, the direction of Muscovite expansion were likely related to local agro-climatic conditions. As one slightly richer way to control for geography, models 3, 6, and 7 substitute latitude and longitude for the distance to Moscow variable.<sup>34</sup> The size and significance of the latitude variable again suggests that serfdom was more prominent in the Russian center and north (where, as model 7 suggests, *obrok* was more common among northern serfs) and less evident in the newly settled, more agriculturally productive areas to the south. Although studies such as Hoch (1985) have emphasized the characteristics of directly controlled (by the serf owner) agricultural serf estates, it turns out that the modal serf owner was likely to have engaged in more hands-off management utilizing *obrok* and small amounts of ancillary labor services.<sup>35</sup>

Unfortunately, other district-level information for the pre-1861 era is very scarce, and this limits the identification of exogenous sources of variation in serfdom.<sup>36</sup> After 1861, considerably more data are available, but using them to *causally* explain the variation in serfdom is problematic for a number of reasons, including the basic timing. However, there may be interesting possibilities in this direction, as suggested by the result on the mean oat yields variable included in model 7. Although this variable reflects conditions from the 1880s and 1890s, it does proxy for overall land productivity, as investments that would have dramatically improved soil quality or new agricultural practices were likely limited prior to 1900, especially when comparing across districts within a province. That this variable was negatively related to the share of serfs on quit-rent is consistent with the logic that serf owners in such districts were trying to extract payment obligations to take advantage of the relatively better labor market opportunities outside of agricultural production on the estate.<sup>37</sup>

One particularly intriguing possibility for a more plausibly exogenous source of variation in the extent of serfdom lies in the distribution of monastic properties across European Russia. In 1764, Catherine the Great issued an edict transferring monastic land *and the resident monastic serf population* to state control. Prior to this date, peasants residing on monastic land were subject to many of the same constraints as privately owned serfs. Indeed, the professed reason for the reform was that the state was concerned about the especially exploitative conditions faced by the monastic peasants (Zakharova, 1982). The result was the transfer of approximately 2 million

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<sup>34</sup> We have also experimented with including contemporary indicators of soil quality taken from Morachevskii, ed. (1907). This source documented the presence of 22 different soils across European Russia. We reduced the dimensionality to two – a dummy variable for whether any type of black earth soil was present in the district (mean = 0.29). Importantly, including this variable did not change the sign, size, or statistical significance of the other estimated coefficients. Moreover, this indicator for high quality soil was strongly and negatively associated with the share of serfs on *obrok*.

<sup>35</sup> While the share of peasants under *only obrok* was relatively small at around 25 percent, mixed obligations of quit-rent payments and some relatively limited labor services (often for non-agricultural purposes) were fairly common, especially in the central and northern provinces (Fedorov, 1971, pp. 332-335).

<sup>36</sup> In future work, we hope to expand on our controls for local geographic conditions by employing GIS software to match modern soil and climatic information to the district-level boundaries from the 19<sup>th</sup> century.

<sup>37</sup> Similarly, the correlation of the share of serfs on *obrok* with the share of adult males with a main occupation in agriculture, according to the 1897 census, was -0.43. Although, the correlation of the agricultural occupation share with the total population share of serfs in 1858 was only -0.1, including these later oat yields in the fixed effect model of the serf population share generated a positive and marginally significant coefficient. This is consistent with a non-random allocation of serf estates to the nobility.

such peasants to state control. If one assumes that the original establishment of monasteries roughly paralleled the granting of populated estates for state service (or was correlated with the unobservable determinants of the latter), then the geographic distribution of monastic expropriation may be interpreted as an exogenous source of variation in the presence of state peasants, who comprised the bulk of the non-serf population by the 1850s.<sup>38</sup>

*[Insert Table 4 about here]*

Table 4 explores this possibility using what is admittedly a poor proxy for the distribution of expropriated monastic serfs – the number of monasteries in each district that ceased to function as independent institutions prior to 1764 (per 10,000 people in 1860).<sup>39</sup> Indeed, if the numbers in Table 4 are to be believed, that is exactly what we find: the number of monasteries closed prior to 1764 per 10,000 people was strongly (in the economic and statistical sense) *negatively* related to the prevalence of serfdom in the late 1850s. The F-statistic on the monastic failure variable is approximately 10 in the serf population share regression. The geographic distribution of these monasteries was unrelated to the share of serfs on *obrok* only. We are hopeful that additional research into the empirical evidence on this or other quasi-experiments channels (i.e. the specific mechanisms, timing, and direction of Muscovite expansion) will result in a set of plausibly exogenous determinants of the distribution and characteristics of Russian serfdom, which may then be utilized in research on the institution’s “effects” for development. We return to this issue in the concluding section.

## **2: Emancipation, Redemption, Peasant Factor Endowments, and Inequality**

Alexander II’s manifesto of February 19, 1861 initiated emancipation of the serfs and began a sequence of complimentary rural reforms. These measures not only granted new legal freedoms to the rural population, but they also transferred formal land rights to the peasantry in a mortgage-like process referred to as “redemption.”<sup>40</sup> In comparison to other cases of rural reform

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<sup>38</sup> Technically, the former monastic serfs were re-labeled “economic peasants” until the Kiselev reforms completely integrated them with the rest of the state peasantry. Zakharova (1982) also notes that secularization was also driven by state demands for new revenue sources and pressures from local nobility aiming to acquire the land. She provides only anecdotal evidence of the latter possibility. The 1764 decree secularized monastic lands in Siberia and the central provinces of Russia, with later decrees in the 1780s doing likewise for the Western provinces. However, as noted by Zinchenko (1985), the Western provinces exhibited quite extensive property holdings among different religious entities into the 19th century, with a series of decrees in the 1840s resulting in their secularization as part of the broader state peasant reforms.

<sup>39</sup> Utilizing just the count of closed monasteries led to virtually identical results, as does the employment of different population denominators. The district-level counts of such monasteries were compiled from the lists in Zverinskii (2005 [1897]). The specifications in Table 4 include both latitude and distance to Moscow as controls; the results are unchanged if either or both are dropped. We are currently collecting information about the number, location, and characteristics of the monasteries actually affected by the original decree (and subsequent ones). If the location of these closed monasteries (which were generally consolidated into larger complexes) was correlated with the number actually expropriated (and, presumably, the number of peasants affected), then this proxy may still hold some validity as an explanatory factor behind the variation in serfdom’s prevalence. An immediate counterargument would be that the closing of a monastery was possibly related to economic conditions that would have made private estate ownership unattractive as well. In this sense, the variable is a proxy for unobservable factors, rather than acting as a “treatment” in the natural experiment sense. Alternatively, the existence of monasteries might have reduced the possibility of land being granted to state servitors in the first place.

<sup>40</sup> Emancipation redefined the peasantry’s legal status by allowing them to freely enter into contracts and ending the nobility’s *de jure* (but, of course, not necessarily *de facto*) control over their peasants’ lives and over local justice. The General Statute and four Local Statutes governed this process. The General Emancipation Statute was issued as

in 19th-century Europe or slave emancipation in the Americas, Russian peasants received substantial land rights, albeit generally in the form of communal allotments with associated collective liabilities for the mortgage-like payments. Rather than simply expropriating the peasants or the landlords, the state constructed the reforms to include a series of steps that slowly transferred land rights to the different types of peasants while (partially) compensating the nobility for their losses. Financing for the transfer was generally provided by the state, with peasants repaying the loans over an extended period that was only projected to conclude in the 1910s. There was substantial heterogeneity built into this mortgage-like process: the price and amount of land allowed to each community was locally differentiated; leeway was left to bargaining between peasants and landowners; and different reforms were initiated for very small estates, for peasants that resided on state or Tsar-owned land, and for serfs employed as domestics. Overall, these reforms led to hopes that the Russian economy would begin to modernize and catch up with the industrializing nations of Western Europe. Almost immediately, however, contemporaries perceived a growing economic crisis in the countryside and attributed this to particular features of the emancipation reforms (e.g. *Doklad*, 1873). The debate over the economic effects of these reforms continues today, although empirical work on this topic remains quite limited.<sup>41</sup>

## 2.1 Serf Emancipation and Redemption: The Nuts and Bolts of Institutional Change

As a first step, the Emancipation Statutes – the Main statutes and subsequent legislation – called for the formulation of *ustavnye gramoty*, or regulatory charters, between the former serf communities and their previous landlords. These charters were to be completed by 1863, with hundreds of newly named *mirovye posredniki* (peace mediators) aiding in their writing and ratification (Easley, 2008; Tolstoy famously worked as a mediator). Based on rules laid out in Local Statutes, the charters translated the previous rights and obligations of the serfs into new collective land endowments and sets of labor duties or cash payments. The number of obligated souls (*dushi* – a tax unit roughly equivalent to one working-age male) was set on the basis of the tax census of 1857-58.<sup>42</sup> If the amount of land per soul (a soul “allotment,” or *nadel*) exceeded the local maximum norm as defined in the Local Statute, the excess could be “cut-off” and retained by the landlord. If soul allotments fell below one-third of this maximum norm, land was

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PSZ, Ser. 2, No. 36657. The four Local Statutes were Nos. 36662-36665 (No. 36662 pertains to the Greater Russian provinces that are the focus here). The Main Redemption Statute was issued as PSZ, Ser. 2, No. 36659. Emancipation and Redemption were part of a sequence of measures known collectively as the *Velikii reformy*, or Great Reforms, which also included changes in the judicial system, the military, local administration, and the state’s financial organization (Eklof et al., 1994; and Zakharova, 2005).

<sup>41</sup> According to Alexander Gerschenkron (1965), the strong collective liability of households in the newly formalized commune effectively tied labor to the land and restricted the flow of resources into industry. Soviet scholars emphasized that the reforms fixed land endowments too low and set their “price” too high, which led directly to growing poverty in the countryside and rural “proletariatization” (e.g. Khromov, 1967). More recently, some scholars have begun to question whether the reforms had much of an impact at all. Hoch (2004 and 2010), Gatrell (1994), Mironov (1999), and others argue the institutional constraints of the commune were not enforced, and that the land settlements did not significantly change the amount or the price of peasant land-holdings.

<sup>42</sup> There were allowances for community members to opt out of the settlements at this point, but few appear to have done so. For those households that signed on to the initial land charters, the law stated that the resulting allotments and associated temporary obligations had to remain in place for at least nine years. Those serfs who previously served as domestic servants, rather than in the fields, were generally excluded from the settlements. For a discussion of these possibilities in black-earth Kherson province, see Leshchenko (1971).

to be added to the new endowment to top it up.<sup>43</sup> This maximum allotment norm corresponded to either an amount of labor (in days per year) or a fixed payment.<sup>44</sup> At a minimum, landlords had the right to keep at least one-third of their land, and until 1870 they could reduce peasant allotments to one-third of the maximum norm at will. These rules pertained only to the arable land on the serf estate. Distinct conditions held for garden plots (passed entirely to the former serfs without charge) and for other types of land. Significantly, the former serf-owner kept all claims to forests and meadows, which were vital inputs into farming (via livestock) and some non-agricultural livelihoods. Even in the case of arable land, the landlords had the right to pick and choose the specific property they retained as long as the amount available to the peasants followed the statutes.

For most of European Russia, the emancipation statutes framed the peasant property rights under consideration as collective, where the relevant party was a newly formalized version of the traditional peasant commune known as the *sel'skoe obshchestvo*, or rural society.<sup>45</sup> Some mechanisms for “individualizing” these rights were available under the statutes, and some resources (especially garden plots) were generally considered to exist under private tenure, but for the most communities, the land described in the land charters was legally denoted as communal allotment land (*obshchestvennaia nadel'naia zemlia*), whereby the community could redistribute specific plots among member households. The property rights of individual households were heavily circumscribed on such land. However, for western and southwestern provinces, and if specifically desired by communities elsewhere, the property and associated obligations were *collectively* denoted in the charters but the rights were granted as *household* allotment land (*podvornnaia nadel'naia zemlia*). Such holdings were not subject to communal redistributions, although the exact legal status (for mortgaging, etc.) of these plots was not well defined in the law, and joint liability for payments apparently remained in practice. For both types of allotment land, statutes limited the alienability of the property until at least 1870.

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<sup>43</sup> For example, the 13 districts of Moscow province were split into three regions with maximum allotments defined as 3, 3.25, or 3.5 *desiatiny* per soul (1 *desiatina* = 2.7 acres). The 1/3 rule defining minimal allotments differed slightly in peripheral areas.

<sup>44</sup> In Moscow province, obligations were capped at 40 days of labor or 10 rubles per soul. It was possible for villages to accept so-called “gift allotments” (*darstvennye nadel'i*) of one quarter of the maximum norm, free of any obligations. There were very few of these villages in Moscow province, but they were significant elsewhere. According to data collected in 1907, districts with the greatest number of such villages – roughly 35 percent of all communities – were located in southern Black Sea (Ekaterinoslav' and Taurida) and southwestern (Saratov) provinces. These data were produced from a specific effort to investigate conditions in such *darstvenniki* settlements, which were reported in 162 districts (collected in Burdina, 1996). For the 109 districts with all information, the peasants lost approximately 75 percent of their existing land in agreeing to such small allotments. The correlation between the share of land lost and the relative importance of purchased and rented land (compared to remaining allotment) in 1907 was high (0.34, N = 85)

<sup>45</sup> Nafziger (2010) describes the legal differences in the two types of allotment land. The definition of the exact “community” to act as one side in the emancipation/redemption process was a complicated issue that occupied many clauses of the General Emancipation Statutes. The new “rural societies,” which came to be the central pillar peasant self-government, were meant to correspond to existing communities engaged in some joint management of land and/or resources. However, the overlap was not perfect, which created a further distinction between the institutional conditions of serfs and other peasant groups (where the newly formalized communal bodies were the same as the pre-existing structures). See *Ibid.* and the sources cited within.

By the end of 1864, almost all of the regulatory charters were certified by the state authorities and former serf communities entered into “temporary obligations.”<sup>46</sup> During this stage, the households assigned to a commune were collectively liable for the revised cash or labor obligations outlined by the charters (even if the allotment land was under *podvornnoe* tenure). Households could only exit with the unanimous approval of the rest of the members (and, in general, not before 1870). Those wishing to leave had to give up all rights to a share of the commune’s land, and the commune had to agree to take up their outstanding debts and shares of obligations.

Temporary obligations were intended to last until the financial arrangements were made to legally transfer the land to the peasant commune. This generally involved the formulation of a *vykupnaia sdelka*, or a redemption deal. These deals, which came to resemble mortgage transactions for most peasants, documented the boundaries and value of the land to be formally transferred. The yearly payments (including the monetary equivalent of any labor services) to former serf-owners under temporary obligations were capitalized at a 6% interest rate to establish the aggregate redemption value of the collective land allotment to be transferred.<sup>47</sup> According to the Redemption Statutes, deals could be initiated through mutual agreement between the community and the former serf-owner (requiring a 2/3 vote in the communal assembly) or at the demand of the former seignior.<sup>48</sup> Within many of the mutual agreements, supplementary payments or contracted labor arrangements were included to provide the peasants with access to additional land or resources. Although almost entirely unacknowledged in the literature, such additional contracted elements of the deals possibly did much in reconstituting many elements of serfdom under something like a form of debt peonage.<sup>49</sup>

Due to the incentive issues governing the bargaining process, the formulation of these redemption deals was drawn out, and a substantial number of communities were still engaged in temporary obligations in the late 1870s.<sup>50</sup> District-level information on land ownership, collected in 1877, helpfully divided former serfs into those still under temporary obligations and those who had entered into redemption (Russia, Tsentral’nyi, 1881). According to these data, roughly

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<sup>46</sup> Prior to the signing of the charters, former serfs existed under their previous seigniorial arrangements, subject to some limitations. After obtaining the approval of the local authorities, charters could be mutually agreed to (and signed by the peasants) or forced through by the seignior at a cost in terms of lost compensation – see below.

<sup>47</sup> This was the case for allotments set at the maximum norm in the Local Emancipation Statutes. For allotments smaller than the maximum, the redemption valuation fell less than proportionally, so that the first *desiatina* of allotment per soul corresponded to one half of the (maximum) yearly payment, the second to a third, and so on.

<sup>48</sup> By 1883, less than 14% of ratified deals in Moscow province were mutually agreed upon. Such agreements were prominent in more agricultural areas because landlords often received contracted labor as part of supplementary parts of such settlements (Zaionchkovskii, 1958, especially p. 363). For example, 2083 out of 5926 redemption deals were mutually agreed to in Smolensk province (Budaev, 1967, p. 245), and 633/1090 in Simbirsk (Kanatov, 1964). Some deals were also initiated on the insistence of the credit institutions to which estates were indebted.

<sup>49</sup> In Kherson, up to 70 percent of former serfs were subject to supplemental payments, while in Simbirsk, such additional obligations constituted 20-25 percent of the yearly redemption burden (*ibid.*; Leshchenko, 1971). Such supplementary arrangements were also present as part of temporary obligations under the original land charters. For example, in 1867 the former serfs of the village of Pleshcheevo in Iaroslavl’ district agreed to purchase additional land from the previous owners (the Gagarins) for five years of payments roughly equal to 15 percent of their yearly *obrok* levels under temporary obligations (“Ustavnaia,” n.d.).

<sup>50</sup> By 1876, over 16% of the communities in Moscow province with regulatory charters had not completed a redemption deal with their former seigniors (*Otmena*, 1950, p. 286; and Zaionchkovskii, 1958, p. 363). Budaev (1967, pp. 241-245) notes that mutual agreements tended to occur quickly after 1863, while the relatively greater number of forced redemption deals emerged later in Smolensk.

80 percent of former serfs (74 percent of former serf communes) entered redemption by 1877. This “pace” of redemption varied widely across European Russia, from 100 percent in many Western provinces (where an immediate transition was apparently enforced under the initial redemption statutes) to less than 55 percent in central provinces like Nizhnii Novgorod and Orel.<sup>51</sup> In a decree of 1881, the state mandated that all serfs in temporary obligations were to transition to redemption in 1883 (PSZ, Ser. 3, No. 585).

Regardless of whether redemption deals were mutually agreed upon or not, the newly reconstituted State Bank typically financed the transfer through 49-year loans made to the communes.<sup>52</sup> From the former serf owner’s perspective, the amount they finally received depended on whether or not the deal was mutual and on the amount of existing debt owed by the estate (Gerschenkron, 1965; and Zaionchkovskii, 1960).<sup>53</sup> In aggregate, the total value of redemption loans made to the former serfs amounted to over 860 million nominal rubles, which was roughly one third of best-guess estimates of Russian national income in 1861 (Lositskii, 1906, p.39). This corresponded to approximately 26.8 rubles per redeemed *desiatina* (about 10 rubles per acre) or 95 rubles per male former non-household serf, at a time when mean per capita incomes were likely less than 50 rubles. Out of this aggregate liability, at least 320 million rubles (37 percent) were deducted from what former estate owners received due to outstanding mortgage debt to various financial institutions (ibid, p. 44).

A key feature of the redemption program was that the commune was collectively responsible for making payments on the outstanding redemption debt (in practice, even under *podvornaia* tenure). To enforce household contributions under this joint liability, the communal assembly was granted legal authority over the immovable property and labor allocation decisions of those in arrears, supported if necessary by local police actions (Burds, 1998; and Gerschenkron, 1965). The statutes stated that renewals of passports for work outside the village were only possible if arrears were paid off. If a commune failed to make one of the twice-yearly redemption payments, local state officials could sell assets or punish communal officers. After the community began redemption, households could only legally alienate their share of communal land by paying off

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<sup>51</sup> Exploring this variation is the subject of ongoing research with Quamrul Ashraf. In preliminary regression work, we find evidence that the pace of redemption was slower in less agricultural areas. This suggests that the potential gains from contracting were greater in areas of relatively higher demand for agricultural labor and land, and that the capitalization of *obrok* into the amounts of *property* redemption in non-agricultural areas, by largely depending on the value of serf labor off the land, led to potentially divisive results.

<sup>52</sup> In some mutual redemption agreements, state financing was foregone and a direct deal between the peasants and former owners struck, which outlined the property transferred and the means of compensation. Such deals were a minority – involving approximately 20 percent of former serfs in Simbirsk, for example (Kanatov, 1964) – and they often entailed the continuation of quit-rent payments / labor services in return for land. For *podvornaia* communities, each allotted household technically held their own redemption obligations, but in practice the payments (and other associated tax obligations) were collectively imposed, and the rural societies were considered to be collectively liable.

<sup>53</sup> If the landlord chose to force redemption, the state would only transfer 80% of the land’s redemption value (75% if the redemption allotment was smaller than stated on the regulatory charters). Existing estate debt was subtracted from this percentage. In Simbirsk, approximately 48 percent redemption valuations were withheld due to mortgage debt (Kanatov, 1964). The state-financed portions of the redemption value was paid to the former serf-owners in 5% State Bank notes and “redemption certificates,” which were non-circulating securities intended for eventual conversion to bank notes. Communities paid their liabilities to the State Bank in the form of yearly redemption payments equal to 6% of the loan. This included the 5% interest payments, 0.5% for a reserve fund, and 0.5% on the principle. There were numerous variations in these formulations, depending on the exact nature of the land being redeemed and conditions placed on mutual agreements.

their portion of the loan in its entirety. These *de jure* restrictions lasted into the 20th century and have led many historians – most prominently Alexander Gerschenkron – to see the emancipation and redemption reforms as re-imposing many of the same constraints on mobility as existed under serfdom. In this interpretation, these restrictions lowered the supply of labor into industry, forced manufacturing to be overly capital-intensive, and slowed industrialization, thereby generating a “considerable obstacle” for economic growth that lasted until the Stolypin reforms of the 1900s (1962, p. 121).<sup>54</sup> And because these constraints appeared to bind tighter on the former seigniorial peasants, the implication is that the adverse development effects would have been greater in areas of higher serf prevalence.

Although not denying the possible institutional rigidities imposed by the reforms, Soviet and other scholars emphasized that the first-order effects on the economic conditions of the former serfs stemmed more from their substantially worsened property endowments after emancipation.<sup>55</sup> This literature emphasized how land “cut-offs” (*otrezki*) from peasant holdings under the Local Statutes often reached significant levels, even on top of the already relatively small land holdings granted under serfdom. According to studies of land charters, the former serfs of Simbirsk province lost over 30% of the land they previously utilized (Kanatov, 1964). In Moscow province, they lost 14.2% of their land (Zaionchkovskii, 1958, p. 182). This change in endowments may have forced many former serfs into exploitative rental or purchase contracts – even apart from supplementary components of redemption deals – whereby communes and households obtained land from their former landlords for cash payments or labor services that exceeded the agricultural value of the property (Anfimov, 1980; and Filippova, 1959, p. 378).

Before emancipation, seigniorial obligations were not exclusively based on the productivity of the land but were extracted from the total income of serf labor in both agricultural and non-agricultural activities. As a result, post-1861 redemption payments in provinces such as Moscow, where regular and seasonal non-agricultural employment was prevalent before emancipation, probably continued to exceed the agricultural (rental) value of the land (Hourwich, 1891; and Ianson, 1881).<sup>56</sup> According to some accounts, the loss in allotment land was matched by a rise in its “price” under redemption. Considering data from 9 of the 13 districts of Moscow province, Boris Litvak found that average payments per soul decreased from 9.36 to 8.44 rubles, while the average per *desiatina* left to the former serfs increased by 8.3%.<sup>57</sup> Soviet scholars went on to argue that these higher cash demands caused previously autarkic agricultural households to look off the farm for income sources to pay their obligations, thereby leading to a “proletariatization” of the countryside.<sup>58</sup>

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<sup>54</sup> In other work, we establish that the *de jure* communal restrictions created under the reform process often had little effect in practice (Nafziger, 2010).

<sup>55</sup> The influential Soviet scholar P. G. Ryndziunskii (1983, pp. 99-100) emphasized the restrictive role of the commune when it came to the issuance of passports for migration outside the village.

<sup>56</sup> Domar himself pointed out numerous problems with these attempts to value land, but he still asserted that peasants probably were overcharged for the property they received (1989, p. 437).

<sup>57</sup> These numbers are taken from Zainchkovskii’s (1958, pp. 182-191) summary of Litvak’s dissertation research, which was based on the regulatory charters currently archived in the Central Historical Archive of Moscow. They relate to the 70% of the serf estates in Moscow province that utilized quit-rents rather than labor service. Note that the number of souls likely fell within

<sup>58</sup> “The emancipation reform...strengthened outwork and forced land rentals” (Filippova, 1959, p. 390). More generally, Zakharova argues that the high obligation levels installed in the settlements “hindered the development of the peasant economy” (2005, pp. 159-160).

Recent research by Sergei Kashchenko and his colleagues on the available land charters from several northwestern provinces shows that after 1861, the distributions of land and obligations (for quit-rent estates only) narrowed around the norms proscribed in the Emancipation Statutes, with little change in the median size of land holdings or overall payment levels (Degtiarev et al., 1989; and Kashchenko, 1996 and 2002). Based on these findings and his own research in agricultural Tambov province, Hoch (2004 and 2010) concludes that the charter and redemption deals did not dramatically affect the factor endowments of former serfs, nor did they introduce stronger institutional restrictions on labor mobility and economic development.<sup>59</sup> However, Kashchenko and colleagues do acknowledge the worsening of peasant allotment land with the reforms, the potential for rising obligations per *desiatina* among at least some former serfs, and they are explicit that their findings do not capture the finalization of the land reform through the redemption process. Our analysis of new district-level data suggests that the total sequence of reforms did result in significant and persistent differences in the land endowments (and their price) between the former serfs and other types of peasants.

## 2.2 What about the Non-Seigniorial Peasants?

Peasants residing on privately owned land were not the only ones affected by reform in the 1860s. Serf emancipation was followed by similar acts for the former appanage (Romanov family-owned, i.e. court) and state peasants (we focus on the latter here).<sup>60</sup> Under an 1866 measure, the state initiated a process to fully document the holdings of the state peasants, with land allotments defined collectively at the commune-level and described in “ownership notes” (*vladennye zapiski*). These were compiled in a similar manner to the regulatory charters of the former serfs, but they were based on the officially conducted cadastres of state property in the 1840s and 1850s, rather than any mediated bargaining process at the estate level.<sup>61</sup> As a result, these settlements typically granted state peasant communes the land that they already held usufruct rights over.<sup>62</sup> In return for this property, communities were made collectively liable for 20 years of payments (*obrochnye podati*) that corresponded to their current land rental obligations to the state. Initially, these communal endowments did not entail full ownership rights, as the property was intended for the “perpetual use” of the communities (Zaionchkovskii,

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<sup>59</sup> Similarly, Gatrell (1994) and Mironov (1985 and 1996) assert that the statutes really just continued old limitations on mobility and development under a new institutional guise.

<sup>60</sup> The primary court peasant reform was legislated in PSZ (Ser. 2, No. 39792), while the main state peasant statutes were Nos. 43888 and 44590. The court peasant reform followed a middle path between those experienced by the former serfs and state peasants. Immediately after serf emancipation, the administrations of the court and state peasants were integrated with the new system of local government based on the *sel'skie obshchestva*, which was the official form of the peasant commune that received land rights under the former serf redemption process (PSZ, Ser. 2, No. 42899).

<sup>61</sup> By the end of 1868, all the state peasant villages in Moscow province received ownership notes (Zaionchkovskii, 1960, p. 278). The mandated transfer of small serf estates (less than 20 souls) from private ownership to state stewardship in the 1860s and 1870s slowed the state peasant reform process. Moreover, the ownership notes were supposed to be presented to communal assemblies so that any outstanding complaints could be registered.

<sup>62</sup> An exception was any forested land, which reverted to state control. If the borders of their community's land endowment were not well documented – often the case in peripheral areas – state peasants were to receive no more than 15 *desiatina* per male soul (8 in more populated areas). Furthermore, the Kiselev reforms in the 1840s had already formally established the communal basis for the land rights and collective obligations of state peasant villages (Adams, 1985; and Ivanov, 1945). As a result, the land settlements may have had little impact on the *de jure* and the *de facto* institutional structure of the state peasant villages, but some slight adjustments of the amount of property under a community's control may have occurred. It appears that the regional distinction in *obshchestvennaia* and *podvornaia* rights under the Local Emancipation Statutes was kept for other types of peasants.

1960, p. 274). However, following legislation in 1886, these payments were converted into redemption obligations, and the former state peasant communities gained the same property rights that the former serfs held over redemption land (PSZ, Ser. 3, No. 3807).

Limited evidence on ownership notes and final land holdings does suggest that the state peasants experienced some changes in their land endowments during their reform process, likely due to statute caps on allotments per soul. State peasants in Moscow province lost some arable land and access rights to a substantial amount of forested area (Druzhinin, 1978, p. 108). In Simbirsk, state peasants lost 14.8% of their land, although this was less than half of the percentage lost by the former serfs (Kanatov, 1964). Even with these losses, the final amount of land was likely more favorable than what was received by the former serfs (Table 2 and below). Rough calculations have shown that the total obligations (including various property-based state and local tax assessments) on the state peasantry were substantially lower than the payments made by the former serfs and were very close to what they paid before the reforms (Ianson, 1881; and Ivanov, 1945, pp. 112-121).<sup>63</sup> We explore new evidence on these differences below.

Therefore, as a result of the land settlement process, serfs may have lost more land and remained responsible for greater obligations than other types of peasants. Other aspects of the economic and institutional conditions of the state peasants were likely better (or at least less onerous) than those of the serfs before the reforms, and these may have translated into better outcomes afterwards.<sup>64</sup> Some of the differences between these two types of villages – endowments and obligation levels – are measureable, while others – e.g. the quality of self-government or the amount of communal restrictions on labor mobility – are unobservable. At the same time, state policies increasingly treated the various types of peasants in the same way. Statutes in 1886 and 1893 reinforced state and communal control over inheritance practices, land allocation, and the possibility of household exit from the burdens of redemption for both state peasants and former serfs.<sup>65</sup> As a result, Gerschenkron and others argue that the two types of peasants really faced similar constraints through the communal structure of land rights and collective obligations, at least after 1866.<sup>66</sup> In addition, other reforms resulted in more equality of obligation levels within the peasantry. Measures in the 1880s and 1890s reduced former serf redemption payments and brought them towards (but not all the way to – see below) the levels among the state peasants by 1900.<sup>67</sup> Overall, and to evaluate the possible channels by which serfdom as a distinct institutional

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<sup>63</sup> Hourwich notes that for Riazan province, just to the south of Moscow, the effective taxation rate from redemption and other payments was higher for former serfs than for state peasants (1892, pp. 54-55). Deal (1981) finds similar differences between state peasants and serfs in pre-reform Khar'kov province.

<sup>64</sup> The governor of Perm province in the 1830s, M.M. Speranskii, noted that every serf wished to become a state peasant (cited in Crisp, 1976, p. 76).

<sup>65</sup> See PSZ, 3rd Ser., Nos. 5578, 9754, and 10151. The latter legislation made an individual household's redemption of their portion of the outstanding loan subject to the approval of a two-thirds majority of the communal assembly. It also forbade any sales of allotment land to non-peasants.

<sup>66</sup> In Gerschenkron's (1965) interpretation, communal restrictions on peasant mobility only eased after 1900. Collective responsibility for taxes and land payments was formally ended in 1903. Redemption payment arrears were forgiven after 1905. Administrative and financial measures were passed that made it easier for households to consolidate their land and exit the commune. These Stolypin reforms were intended to improve rural conditions by abrogating many aspects of the institutional regime set up in the 1860s. However, the commune survived the Bolshevik Revolution and grew in relevance with the collective seizures of land from the former nobility. Only the establishment of collective farms in the late 1920s and 1930s formally ended the institution of the land commune, although these new units did retain elements of the old regime (Allen, 2003; and Male, 1971).

<sup>67</sup> In reaction to the slow transition of former serf villages to redemption, and to the perception that tax and land payment arrears were increasing, legislation in 1881 lowered payment levels from 1883 onward and made

system may have generated persistent effects on the Russian economy after 1861, it is necessary to quantify the level and inequality of endowments that peasant emancipation and the various land reforms generated.

### 2.3 The Endowment Implications of Serfdom and the Land Settlement Process

Most of the land held by the peasantry was the direct result of the land reform process and was essentially fixed after 1866. This allotment land – mostly owned collectively by the new communal institutions – was legally distinguished from private land holdings, and it was difficult to shift property between the two categories. By 1905, across European Russia, allotment land amounted to approximately 124 million *desiatina*, while individual peasants, peasant partnerships, and the communes themselves owned roughly 24.6 million *desiatina* in total under private property rights (Russia, Tsentral’nyi, 1906).<sup>68</sup> These and other statistics on land holdings presented here were compiled from the full set of published returns to two official land surveys in 1877 and 1905 (Russia, Statisticheskoe, 1880-1885; Russia, Tsentral’nyi, 1906). These data have informed discussions of property holdings among the peasantry and other classes since the 19<sup>th</sup> century (e.g. Tarasiuk, 1981), but they have never been fully explored at the district level.

Within the peasantry, the second panel of Table 2 indicates that serfs had access to less property than state (or court) peasants by the late 1850s. This is true even if only districts with both state peasants and serfs are considered. The bottom panel of Table 2 indicates that the average allotment per household was considerably smaller among former serfs in 1905 (again, this holds if the same set of districts are considered for each type of peasants).<sup>69</sup> As we summarize in Appendix Tables 3 and 4, the district-level land data show that this gap was evident in 1877, as well as for different types of allotment land granted as part of the emancipation and redemption processes (see below). These statistics are consistent with the former legal status of the peasant population generating long-run differences in land endowment *levels*, but the available data from the two surveys also allow us to consider other dimensions of persistence.

[Insert Figure 6 about here]

Figure 6 depicts geographic variation in 1905 for four other outcomes stemming from the reform process (similar district-level maps of the slightly less complete 1877 data are available upon request). Figure 6a indicates the average landholding of the nobility in 1905 (also see Table 2).<sup>70</sup>

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redemption mandatory (PSZ, 3rd Ser., Nos. 577 and 585). The reduction in payments was substantial: one ruble from every soul allotment, plus additional discounts for certain villages. This was approximately 13% of the per-year obligations in the central provinces. This was calculated from village-level data on reductions made in Petersburg province (RGIA: 577.50.1071.2). Also see Table 5. On the lowering of payments, see Zaionchkovskii (1960, p. 318) and below. All former serf-owners that were forced to enter redemption at this time received 88% of the property’s valuation.

<sup>68</sup> To compare, by 1905 the nobility owned about 53.1 million *desiatina*, while all private property amounted to 97 million *desiatina* in European Russia. The state, through various chancelleries and ministries, along with other private institutions (churches, charities, etc.) held approximately 140 million *desiatina*, most in the far north and other peripheral regions (Russia, Tsentral’nyi, 1906).

<sup>69</sup> Appendix Table 1 provides evidence that the total amount of land per peasant household – both allotment and all types of private holdings – was significantly less in 1905 in districts where serfdom was more prominent. This difference was even greater when allotment land only is considered (Appendix Tables 3 and 4).

<sup>70</sup> The 1877 and 1905 data indicate the total number of properties by amount of land, social class of owner, etc. Therefore, multiple properties owned by the same individual, commune, etc. were counted as separate holdings. There is very little information in these data on the quality or attributes of land holdings by district, except for the

The uniquely large-scale of Russian serfdom depicted in Figure 3 is reflected here, as the size of land holdings in 1905 was highly correlated (0.76) with the mean number of souls on large estates in the late 1850s (Table 2 and Appendix Table 5). The 1-2 percent of the population in the noble class continued to own large properties in 1905, particularly in the eastern and southwestern provinces of European Russia. However, if we compare the mean noble holding in 1877 with the level in 1905 (Appendix Tables 3 and 4), it is evident that the nobility's property dominance was in decline. Appendix Figure 2 documents this change across European Russia; intriguingly, areas in the southwest and the central agricultural region south and southeast of Moscow saw relatively limited losses of land among the nobility during this period.

Summing up over allotment and non-allotment land, mean peasant holdings per household were much smaller than other social classes (Figure 6b.i and ii and Appendix Tables 3 and 4; except townsmen), although peasants tended to hold relatively larger properties in the central and northwestern provinces. In comparing Figure 6b.i and ii (also see Appendix Tables 1, 3, and 4), access to private property via developing markets for non-allotment land did allow peasants to expand their holdings by roughly 2.5 *desiatina* per household by 1905 on average. However, the difference between 1905 mean allotments and total holdings in a district was uncorrelated with the serf share of the population in the 1850s, with the share of serfs who were exclusively on quit-rent, or with various indicators of agricultural productivity (Appendix Table 5; other results available upon request). The acquisition of private property by peasants over the period was somewhat more evident in central provinces, although the spatial patterns are hard to pick out (Appendix Figure 2), and the percent of households or communes acquiring non-allotment land was relatively low but increasing over the period. These geographic data do not include changes in land ownership by peasant associations (*tovarishchestva*, i.e. partnership), which had become an important category by 1905.

Figure 6c shows the variation in property inequality in 1905, with or without communal allotment land included.<sup>71</sup> These indicators are derived from the underlying size distribution of land among more than twenty bins and more than a dozen types of private and collective property owners (resulting in considerably richer data than are available for other contemporaneous societies such as the United States or Germany). These maps indicate that land inequality was higher in the northwest and in some of the more agricultural productive districts in the western Ukrainian region. Unsurprisingly, the inclusion of allotment land per peasant household – which we are forced by the data to assume does not vary within a community – resulted in a lower level of inequality. Appendix Figure 3 depicts the changes in the Gini coefficient for private holdings between 1877 and 1905: while spatial patterns are hard to identify, the persistence of the (high) mean level of inequality suggests the long-run implications of the reforms, albeit with some geographic heterogeneity (see Appendix Tables 3 and 4).

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arable (*pakhatnaia*) acreage in 1877. According to the summary measures in Appendix Table 3, peasants and townsmen tended to hold a slightly higher share of arable private land than other classes.

<sup>71</sup> All the variables depicted in Figure 6 are defined at the district-level, and so land holdings split across multiple districts are necessarily treated as separate. While this means that we are undercounting the largest landholdings and overstating the number of medium and smallholdings, the extent of this bias is likely small, given the relatively large size of Russian districts. Private holdings of various joint and collective entities (partnerships, peasant communes owning non-allotment land, corporate holdings, etc.) are treated as single properties under one owner for the purposes of Figure 6. The owners of allotment land and private property are necessarily treated as non-overlapping groups in the calculation of the Gini coefficient in Figure 6c.ii.

As noted above, the emancipation and redemption processes distinguished two types of allotment land: communal (*obshchestvennaia*) and household (*podvornaia*). In practice, under the coordination needed within the common three-field system of farming, the two types may have been utilized in very similar (i.e. collectively organized) ways. However, recent studies have argued that these were very different regimes, with different implications for agricultural investment and the alienability of household plots (Dower and Markevich, 2012). Therefore, the legal distinctions made in the initial rights may have constituted another persistent source of variation in endowments. Across European Russia, roughly 20 percent of allotment land was held in *podvornnaia* tenure, with the majority of this type of property located in the southwestern and western provinces as per the particulars of the applicable Local Emancipation Statutes (Appendix Tables 3 and 4 and Appendix Figure 4). Intriguingly for future research, a number of central agricultural provinces do show substantial variation in the type of allotment land tenure.

Besides the amount and type of transferred land, the reform process also dictated the subsequent size of the payment obligations imposed on the new peasant property rights. The top several rows of Table 5 present summary statistics on these payments before and after they were lowered in 1883.<sup>72</sup> This lowering reduced redemption payments among former serfs from 1.7 to just over 1.3 rubles per *destiatina*, but they still remained much higher than the redemption obligations faced by the former state peasants in 1886. However, accumulated redemption payment arrears were actually lower as a share of yearly assessments in districts where serfdom was more prevalent. This may have simply reflected better economic or agricultural opportunities in those districts, rather than anything particular to serfdom. We explore this more explicitly in the next subsection.

The redemption settlements not only fixed land payments, but they indirectly set various state and local property taxes. By allocating specific types of property in quasi-fixed ways, the reforms largely determined the assessment base for peasant and non-peasant landowners in each district. While the taxation rates could be determined locally, at least in part (Nafziger, 2011), Panel B of Table 5 indicates that the total tax assessments from state, peasant government, and district (*zemstvo*) authorities in 1895 and 1903 were somewhat higher in those districts where serfdom had been more prevalent. However, accumulated arrears were significantly lower, on average, in those same districts. Both of these findings are consistent with the endogenous location of serfdom itself if the institution emerged where it was particularly in the interest for the Muscovite nobility to accumulate land and consolidate control over a mobile labor force – i.e. where land was more productive (and therefore could be "taxed" at a higher rate).

## 2.4 Econometric Evidence

The evidence presented in Section 2.3 suggests several possible correlations between the variation in serfdom / emancipation and the subsequent nature of land endowments across rural Russia. However, these connections may simply indicate underlying agro-climatic conditions or unobserved (and fixed) historical conditions driving local economic activity. Therefore, it is useful to extend the analysis in Section 2.3 by employing a simple econometric framework and controlling for the geographic characteristics we can observe at the district level. At this early

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<sup>72</sup> This reform deducted roughly one ruble per soul allotment (i.e. the mean holding per male soul) from all redemption settlements. Also, communities that were having particular difficulty fulfilling their redemption payments (as concluded by researchers in the Ministry of Finance) received a "special" reduction. See PSZ (3rd Ser., Nos. 577 and 585) and Footnote 67.

stage, the relative paucity of data at such a level of disaggregation leads us to focus on a very parsimonious set of simple specifications, the results of which are presented in Table 6. The right-hand-side variables of interest are three different measures of serfdom – the overall share of the population in the late 1850s, the share of serfs on “large estates,” and the share of serfs exclusively on quit-rent. The dependent variables we focus on are various indicators of the level of, change in, or distribution of post-reform land endowments, or closely related payment outcomes such as the amount of, or arrears on, redemption and tax obligations. In terms of geography, we are only able to control for latitude and longitude, provincial fixed effects, and a small number of other indicators.<sup>73</sup> In addition, most of the specifications also include population density as a simple way to proxy for local economic conditions.<sup>74</sup> The latter two specifications in each panel use the percentage of the population who were serfs in 1860 as weights on the observations. Only some of the models we estimated are reported in Table 6. We continue to experiment with a variety of other specifications and functional forms. The results are available upon request.

The preliminary results in Table 6 are best thought of as signaling correlations worth exploring in more depth, either in and of themselves, or as paths through which serfdom had lingering implications for other aspects of economic development.<sup>75</sup> Despite this caveat, several important results emerge from these exercises. The population share of serfs was positively associated with the *decline* of noble landownership between 1877 and 1905, while showing only a relatively small negative relationship to the total size of peasant landholdings in 1905 (once province fixed effects are taken into account). Comparing these results with the data shown in Table 2 suggests that former serfs were at least partially able to compensate for their smaller endowments by accessing land markets, often to acquire land from the local nobility. In areas where *obrok* had dominated, which likely had lower agricultural productivity, peasants held slightly smaller holdings. This is consistent with regional sectoral specialization over the period. Finally, those districts where larger serf estates dominated saw a slower relative decline of noble land ownership and slightly smaller peasant properties by 1905. This may have been due, in part, to the continued monopsony positions in land and labor markets held by these former serf owners, especially in more agriculturally productive districts.

When we consider the implications of serfdom for property inequality, we find that the population share of serfs in 1860 was strongly associated with more unequal districts. This likely reflects the estate-specific nature of the former serf redemption process: relative to the broadly equalizing adjustments made to property holdings among the state peasantry prior to 1861, the scale of former serf landholdings was largely driven by the size of the estate they used to reside

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<sup>73</sup> The provincial fixed effects not only pick up geographic factors, but they also control for various fixed legal and cultural characteristics of each district’s region. Dropping latitude and longitude had little impact on the other estimated coefficients. In modeling the “determinants” of the Gini coefficients, we also include the share of land owned by anyone at all as a covariate to control for a particular set of outlier districts (where one or two individuals owned most of a small amount of privately held landed property). Including this variable had no effect on other results. We continue to experiment with additional covariates and dependent variables. In all models, standard errors are clustered at the provincial level.

<sup>74</sup> Although this may introduce some endogeneity concerns, we rely on pre-determined (relative to the dependent variables) or reform-era (early 1860s) measures of population density to minimize such possibilities. Controlling for population density in such specifications follows research into land inequality and economic development by Nunn (2008b) and Cinnerella and Hornung (2011).

<sup>75</sup> Note that the 1877 data were only recently, and partially, compiled. Future work will explore the correlates of the changes in endowments between the two years in more depth.

upon. Quit-rent areas, which predominated in the less agricultural central and northern provinces, were more unequal, although the size of this (partial) correlation was small. Districts with larger serf estates were more unequal half a century later, although access to allotment land seemed to mitigate this correlation.<sup>76</sup> Overall, it appears that the variation in serfdom had persistent implications for the distribution of property. If land inequality had effects on the provision of public goods, or impacted investment or structural change through some sort of wealth channel, then these findings might point to important mechanisms by which serfdom may have mattered for subsequent development outcomes.

Besides the direct implications of serfdom for the distribution and size of land holdings, the available data allow us to explore the variation in the redemption and property tax “prices” associated with these endowments (the bottom four panels of Table 6). Our analysis does indicate somewhat higher redemption and tax assessments in formerly *obrok* districts, where the land settlements often over-valued holdings relative to their agriculture productivity. As state and local property taxes were often closely tied to the redemption values, this difference appears to have persisted through the fiscal structure until at least the end of the century. However, utilizing just a few cross sections of the available data, we find relatively weak relationships between the indicators of serfdom and any measure of arrears on redemption or tax payments (denoted as 100 x accumulated arrears relative to total yearly assessments).<sup>77</sup> Although this last result may be subject to bias from some unobservable influences on tax rates, these findings suggest that the legacy of serfdom mattered little for the ability of peasants to meet their obligations by the 1890s. This contradicts much of the traditional literature (i.e. Gerschenkron, 1965; and Robinson, 1972), which viewed rising arrears among former serfs as a sign that emancipation and redemption limited rural economic development. Moreover, the absence of any association between arrears and serfdom holds even though more serf areas (and those where estates were larger) showed persistently higher levels of obligations, despite several reductions of redemption payments over the period (Table 5). The results in Table 6, while perhaps not the last word on these correlations as additional data come on line, present several useful directions for further work on the implications of serfdom and emancipation for subsequent economic outcomes.

### 3 Concluding Thoughts

The results from Table 6 suggest that serfdom and emancipation, while influencing the allocation of land in the following decades, may not have had much impact on the payment abilities of the peasantry. Was this the case for other indicators of economic development in the medium and long term? Rather than rely on modern data on per capita incomes, as in Acemoglu et al. (2012), Bertocchi and Dimicio (2012), or Dell (2010), our more immediate goal is to examine indicators of structural change and human capital development over the last decades of the Imperial period. The massive population, institutional, and economic changes enacted by the Soviet authorities, not to mention the large-scale changes in administrative borders, make any attempts to link pre-1917 variation to modern outcomes difficult in practice and perhaps questionable on theoretical grounds.<sup>78</sup> But if serfdom and the way it ended had implications for the nature (and variation) of

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<sup>76</sup> The correlation between the Gini coefficient for the size of large serf estates (in terms of male souls) and the private land Ginis in 1877 and 1905 are both around 0.3.

<sup>77</sup> Summary statistics for these measures are available upon request.

<sup>78</sup> Some modern Russian surveys, such as the Russian Longitudinal Monitoring Survey, are geo-referenced and have standard income and consumption indicators, and matching these data to Imperial era, district-level information is possible given the GIS maps presented in this paper. However, the nature of the Soviet experience would suggest

economic change in the half-century after 1861, then Lenin's quote at the beginning of this paper may contain elements of truth.

In the recent studies of slavery by Acemoglu et al. (2012), Nunn (2008a), and Miller (2009), and in such influential works as Acemoglu et al (2002), Banerjee and Iyer (2005), and Engerman and Sokoloff (2002), the researchers are able to tie variation in "institutions" (and subsequent property or income inequality) to some exogenous treatment or natural experiment. This has proved difficult in the Russian case. As we documented in Sections 1 and 2, serfdom and the redemption process varied widely based on observable and unobservable local conditions. The results in Tables 3 and 4 provide some suggestive evidence of underlying factors that could have driven the observed institutional variation – particularly the monastic expropriation of the 18<sup>th</sup> century – but at this point in the research, we are still exploring various possibilities for identifying any relationships linking serfdom / redemption, property endowments and inequality, and other economic outcomes.

In preliminary regression work along these lines, we find intriguing evidence of correlations between serfdom / reform outcomes and measures of structural change and human capital accumulation. Figure 6 provides an example of such possibilities by comparing spending on rural education in 1911 and both the predicted and residual components of the variation in serfdom's prevalence. Suggestively, the geography of serfdom was actually tilted towards greater spending (unsurprising given the prevalence of serfdom in less agricultural and more industrially developed areas), but the unobservable factors driving the institution's distribution worked in the other direction.<sup>79</sup> These and similar preliminary results for other outcomes suggest that a broader exploration of the empirical relationships between serfdom and subsequent economic development is certainly warranted. Although the models we employ in this complementary research and throughout the current paper are purposefully parsimonious and exploratory, we hope to improve upon them by incorporating much better geographic and climatic controls, particularly from modern GIS sources such as the FAO's crop suitability indicators. This will partially abrogate the problem of unobservables in models such as those of Tables 3, 4, and 6.

There is perhaps a deeper problem with attributing causation to pre-1861 measures of "serfdom." While Table 6 does appear to show some longer-run relationships between characteristics of serfdom and land endowments and associated "prices," this was at least partially the result of the unique process of land reform that accompanied Russian serf emancipation, rather than any mechanisms of institutional persistence from the coercive labor regime itself. Some of the resulting "endowment effects" can be controlled for alongside explicit measures of "serfdom" in any estimates of effects on other development outcomes. But this might not be appropriate in all cases. The land reform process varied geographically in ways that were certainly correlated with the same set of observable (reflected in the local details of the Emancipation and Redemption statutes) and unobservable factors associated with serfdom. Therefore, and given the timing of the available data, our current research is perhaps best understood as an exploration into the economic consequences of a joint package of institutions and institutional changes surrounding

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that such an effort might provide little return. For one attempt to map pre-1917 information to post-Soviet outcomes, see Zhuravskaya et al. (forthcoming).

<sup>79</sup> One likely possibility underlying the bottom panel of Figure 6 is the role played by the *zemstvo* in funding schooling. As this institution of local government was typically dominated by gentry land owners, areas with greater serfdom actually saw some biases against peasant participation, which would show up here as an unobservable (i.e. non-geographic) component of the variation in serfdom (Nafziger, 2011).

*both serfdom and* the complicated process of emancipation and land reform. Even this expanded interpretation of an institutional "treatment" in the 1860s is complicated by the presence of other, related political, educational, judicial, and economic measures taken during this period of the Great Reforms. In future work, we hope to examine distinct elements of this dynamic set of modernizing reforms surrounding emancipation to better identify the channels by which each *individually* might have influenced economic development up to and into the 20<sup>th</sup> century.

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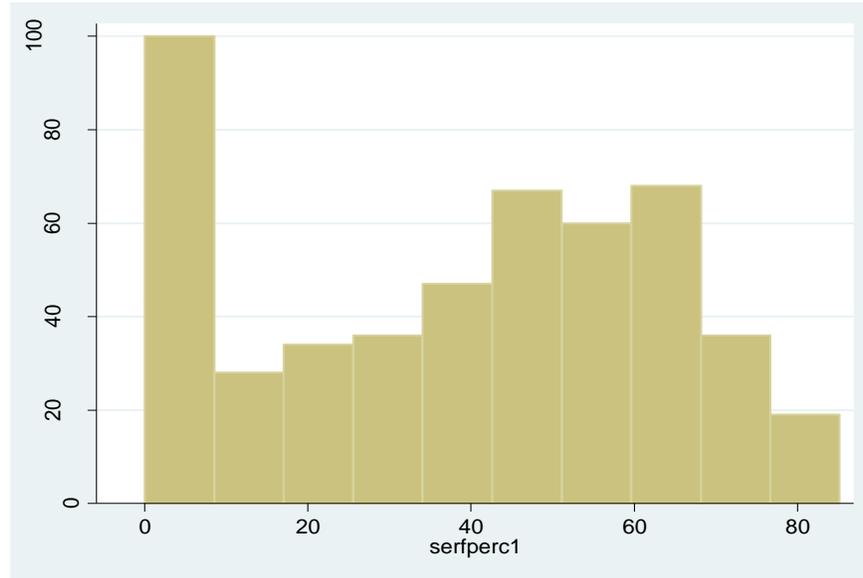
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Table 1: Provincial Indicators of Serfdom in European Russia, c. 1858

Provinces	Total Population, c. 1860	Serfs ( <i>krepost'nie liudi</i> ), c. 1858		
		Share of Total Population	Share of "Household Serfs" of All Serfs	Share of Serfs on Only Quit-Rent Obligations
Arkhangel'sk	284082	0.01	100.00	.
Astrakhan	264374	4.71	4.65	80.85
Bessarabia	957133	1.04	46.11	??
Chernigov	1471866	37.61	9.69	0.14
Ekaterinoslav'	934139	33.09	15.86	0.13
Estliand	303478	0	.	.
Grodno	881881	40.05	3.74	1.93
Iaroslavl'	976866	56.45	5.12	83.07
Kaluzha	1007471	57.14	5.15	52.23
Kazan	1543344	13.79	7.48	12.93
Khar'kov	1583571	29.75	19.37	1.17
Kherson	1114248	28.83	18.83	0.03
Kiev	1944334	57.66	0.65	1.50
Kostroma	1076988	57.31	5.14	83.30
Kovno	988557	36.89	4.01	29.18
Kurliand	754725	0	.	.
Kursk	1812035	38.67	19.77	19.98
Lifliand	897603	0	.	.
Minsk	987471	60.55	2.41	2.54
Mogilev	884640	64.63	2.66	2.94
Moscow	1599808	38.42	4.67	64.84
Nizhegorod	1259606	57.58	2.56	66.93
Novgorod	1134078	43.05	6.40	41.76
Olonets	287354	3.92	6.86	67.11
Orel	1532034	46.87	12.16	18.25
Orenburg	914308	2.66	9.72	19.61
Penza	1188528	45.92	7.04	22.83
Perm	2046481	18.64	3.71	2.15
Petersburg	1053975	24.23	5.16	65.25
Podol'sk	1748466	59.49	0.61	3.11
Poltava	1819110	37.47	12.60	0.50
Pskov	706462	53.81	5.14	21.99
Riazan	1427299	55.45	8.75	37.65
Samara	1530039	15.25	8.60	19.21
Saratov	1636135	40.19	6.71	??
Simbirsk	1140973	38.78	5.78	23.38
Smolensk	1102176	68.82	6.46	25.64
Tambov	1910454	39.00	10.67	21.19
Taurida	687343	5.97	13.15	0.00
Tul'a	1172249	68.53	8.35	23.17
Tver	1491427	50.63	5.49	40.16
Ufa	1597577	7.03	8.14	6.53
Viatka	2123934	1.74	4.35	61.92
Vilno	876116	45.60	4.83	6.90
Vitebsk	635021	57.06	2.86	0.00
Vladimir	1207908	56.99	3.76	67.11
Vologoda	960593	22.40	3.54	81.05
Volyna	1528328	56.53	0.05	0.00
Voronezh	1930859	26.79	12.71	39.43
Don Cossack Land	945576	21.50	1.75	3.26
Totals / Means	59863023	36.39	6.69	25.68

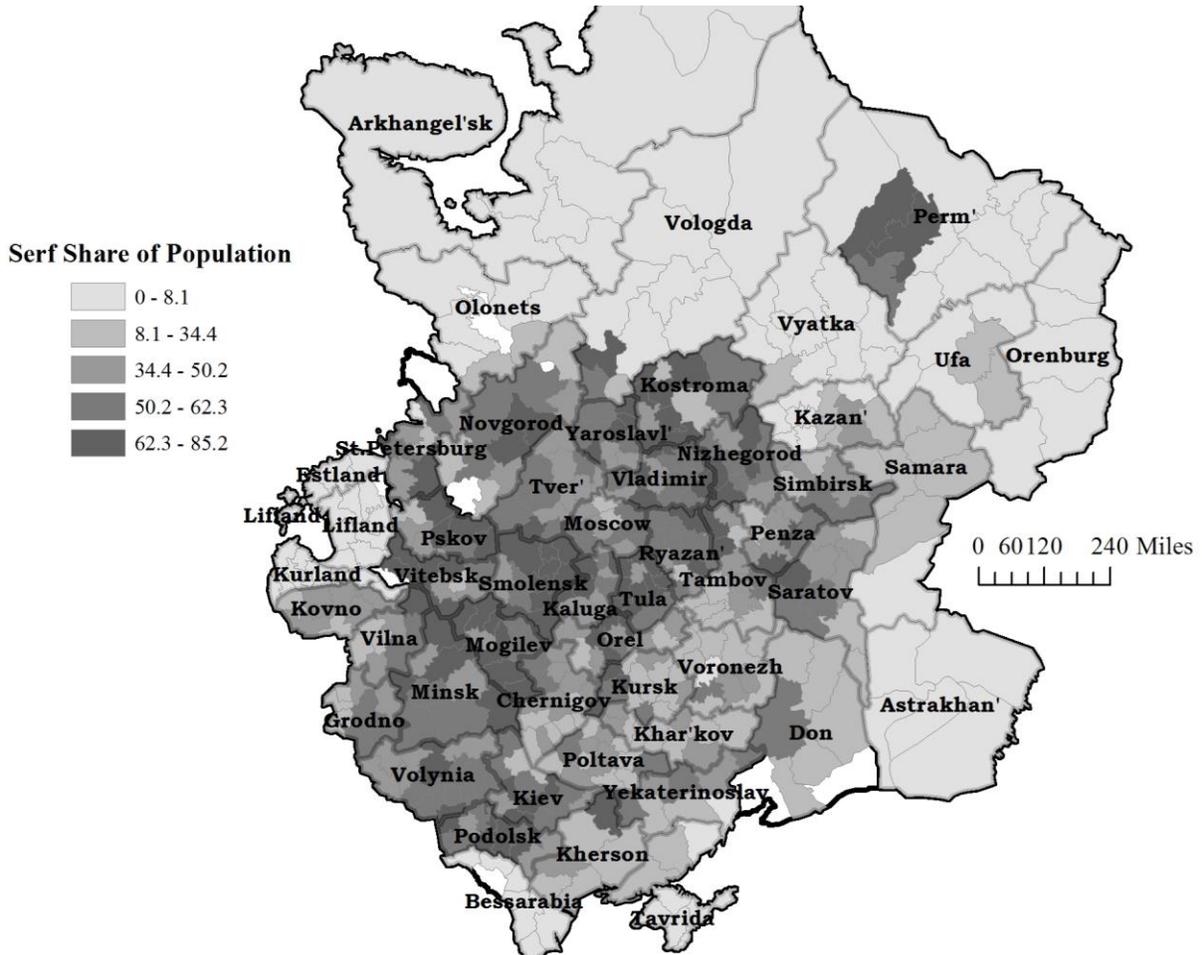
Note: The data are from Bushen (1863), Russia, Tsentral'nyi (1866), Skrebitskii, ed. (1865/6), and Troinitskii, ed. (1982). The 1860 population totals are from tax records and not directly from the 10<sup>th</sup> tax revision data, although any differences are likely small. "??" – Missing data; "." – not applicable

Figure 1a: The Frequency Distribution of Serfdom by District



Note: The variable of interest is the portion of the total population who were serfs, c. 1858. The height of the bars corresponds to the number of districts with serf population shares in a given bin. These data are taken from Bushen (1863) and Troinitskii, ed. (1982).

Figure 1b: The Geographic Distribution of Serfdom by 1860



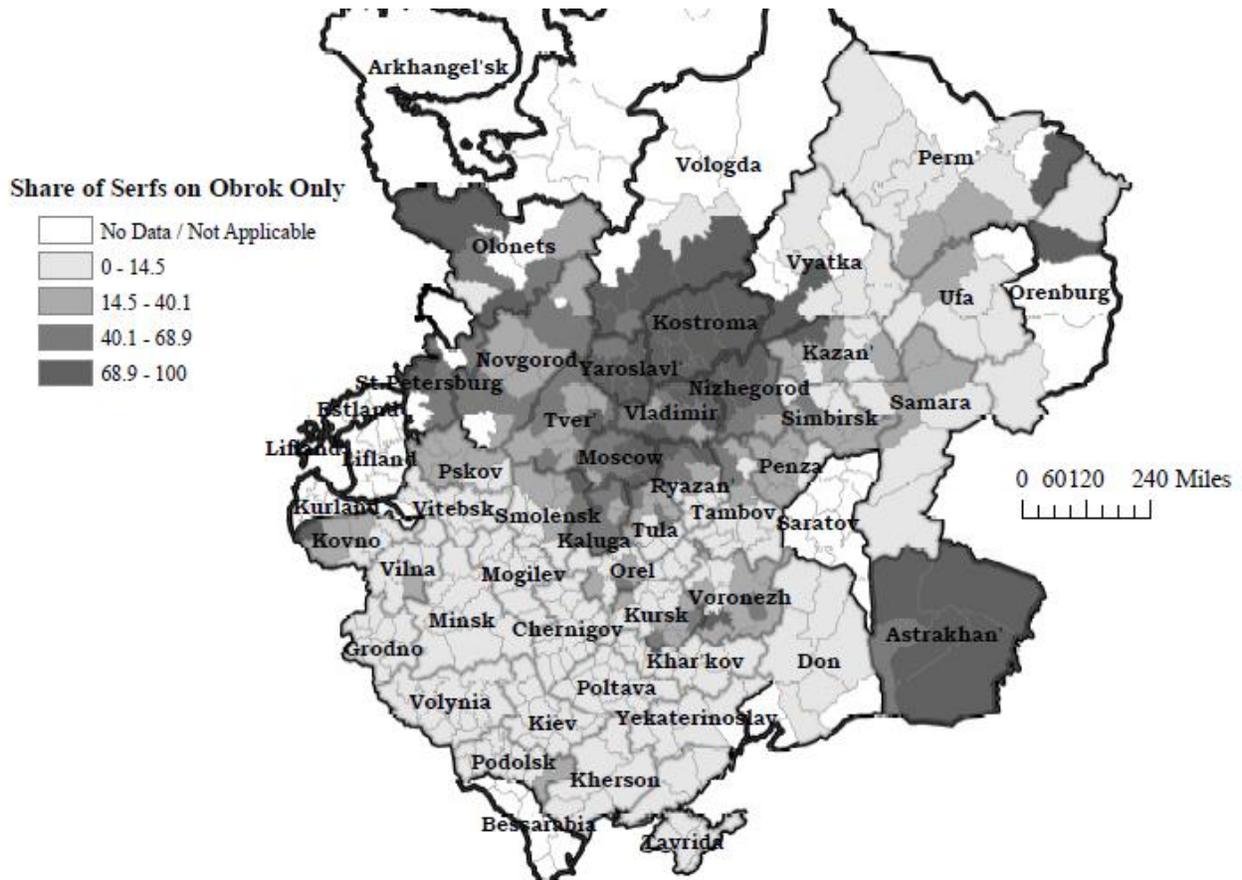
Note: The figure presents the district (*uezd*)-level distribution of serfdom c. 1860, as measured by dividing the number of serfs in 1858 (according to the 10<sup>th</sup> tax revision) by the total population measured in 1863 (according to tax lists). See Table 2 for sources. White districts are those where data are unavailable.

Table 2: Serfdom, Land Holdings, and Obligation Levels, c. 1858 and 1905

	N	Mean	SD	Min	Max
From District-Level Data Compiled by the Editorial Commission					
Share of the total population who were serfs, c. 1858	494	36.39	24.42	0	85.21
Share “household” ( <i>dvorovye</i> ) serfs of all serfs, c. 1858	458	6.69	6.23	0	100
Share of serfs exclusively on quit-rents ( <i>obrok</i> ), c. 1858	430	25.68	29.92	0	100
Quit-rent ( <i>obrok</i> ), silver rubles per work team ( <i>tiagla</i> ), c. 1858	306	25.46	9.66	6.34	115
Land Holdings per Peasant Male Soul (in <i>desiatiny</i> ), c. 1858					
Serfs	387	3.33	1.63	0.4	13
State peasants	351	6.29	5.14	1.05	52.1
Court peasants	110	4.32	3.25	1.3	33
Noble estates (all land, including land allocated to serfs)	424	13.80	27.25	3.5	354.9
Self-Reported Data from “Large Estates,” 1858-1859					
Size of estates (male souls per estate, mean across district)	367	333.83	245.61	30	6563
Share <i>dvorovye</i> serfs of all (male) serfs	360	5.20	3.87	0	34.37
Share of <i>tiagla</i> exclusively on quit-rents	366	24.78	27.13	0	100
Implied share of (male) serf population on “large estates”	376	64.86	15.95	0	100
Gini coefficient of estate sizes among large estates	367	0.42	0.10	0	0.82
Land Holdings per Household / Landowner (in <i>desiatiny</i> ), 1905					
Former serfs – allotment land only	450	6.71	2.92	0.23	42
Other peasants (state, court, Baltic, etc.) – allotment land only	487	12.51	8.64	0.82	143.4
Noble landowners – only single owners	492	494.90	2746.2	4	184062
<i>In districts where % serfs in 1850s &gt; 50%</i>	200	532.87*	3603.4	41.30	184062

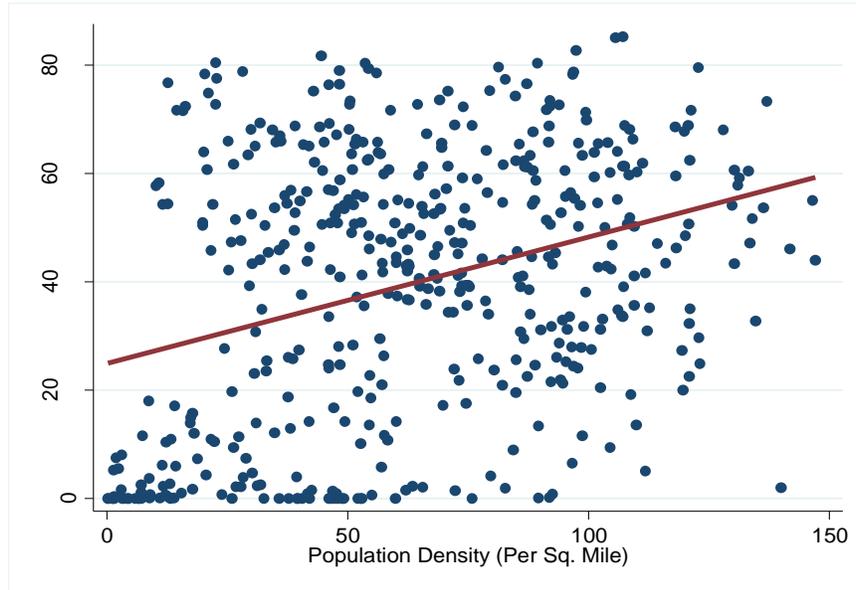
Note: These data come from Bushen (1863), Skrebniiskii, ed. (1865/66), *Svedeniia* (1860), Troinitskii (1982), and Russia, Tsentral’nyi (1906). “Estates” refer to holdings within a district under one landowner. Serf owners often owned estates in multiple districts. For 102 districts, the quit-rent was defined as the mean between low and high amounts among estates. The exceptionally high quit-rents in Kovno province were all defined in this way. The data on large estates are unavailable for Bessarabia, Grodno, Kiev, Olonets, Orenburg, Podol’lia, Ufa, Volynia, and parts of several other provinces. Why these data were not reported in *Svedeniia* (1860) remains unclear. These variable means are weighted by the relevant denominator, except for the *obrok* and land holdings in 1858, where such information was unavailable. One *desiatina* = 2.7 acres. \* indicates that the subsample mean is statistically different from the rest of the sample at the 95% significance level. See Appendix Tables 3 and 4 for further land information.

Figure 2: The Geography of Serf Obligations, c. 1858



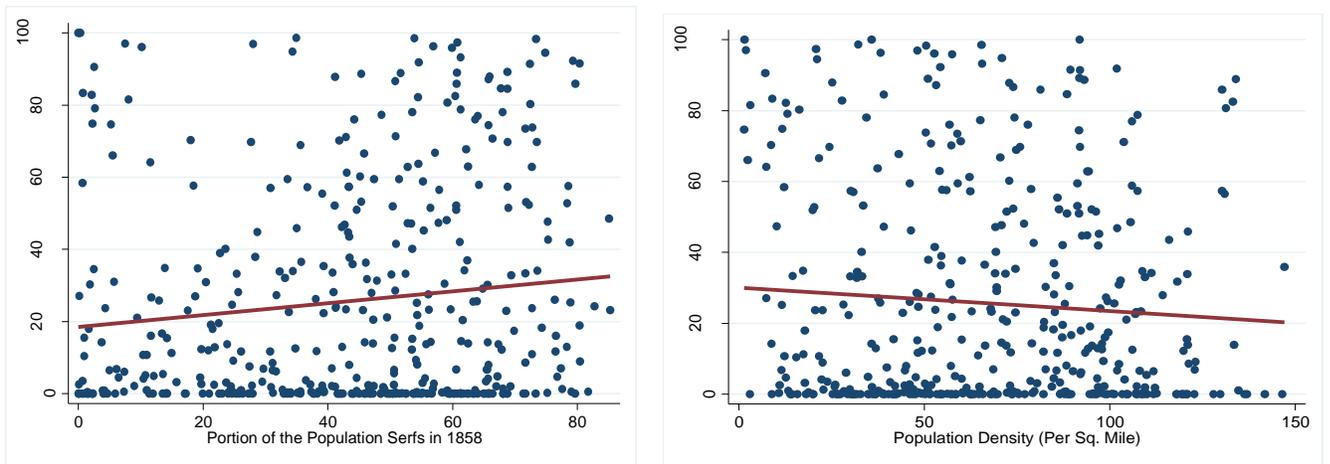
Note: The figure presents the district (*uezd*)-level distribution of serf obligation type, c. 1858, as indicated by the share of peasants *only* on *obrok*. White colored districts reflect either the absence of data or the share does not apply, as there were no serfs. See Table 2 for sources.

Figure 3: Population Density and Serfdom, 1858



Note: N = 424. The figure excludes Moscow and St. Petersburg districts and is limited to the same sample as Figure 4. The plotted line is the least squares line. See Table 2 for sources.

Figure 4: Serfdom, Obligations, and Population Density



Note: The sample is the same as in Figure 4. See Table 2 for information on sources.

Table 3a: Parsing Out the Variation in Serfdom – Baseline Regressions

Dependent Variables:	% Serfs, c. 1860			% of Serfs on Quit-Rent Obligations only			
	1	2	3	4	5	6	7
Pop. Density, 1860 (sq. mile)	-0.0313	-0.0747***	-0.0700***	-0.0573	-0.0185	-0.0164	0.0103
Mean = 70.5, SD = 50.6	(0.0377)	(0.0138)	(0.0118)	(0.0540)	(0.0168)	(0.0177)	(0.0183)
Latitude			2.980**			3.880*	4.169**
			(1.354)			(2.187)	(1.98)
Longitude			-0.472			0.318	0.334
			(0.696)			(0.938)	(0.911)
Distance to Moscow (Kms)	-0.0340***	-0.0400***		-0.0473***	-0.0164		
Mean = 587.5, SD = 305.8	(0.0078)	(0.0133)		(0.0092)	(0.0206)		
Mean Oat Yield, 1884-1900 [seed ratio]							-3.040***
Mean= 7.8, SD = 1.4							(0.969)
Observations	431	431	431	415	415	415	414
(Within) R2	0.216	0.085	0.063	0.217	0.008	0.031	0.067
Province Fixed Effects?	No	Yes	Yes	No	Yes	Yes	Yes

Note: Regressions only consider districts where the share of serfs was greater than 1%. All regressions include constants and utilize robust standard errors clustered at the level of the province. The mean values of the dependent variables are provided in Table 1.

Addendum to Table 3: Correlation Matrix of the Regression Variables

	serfperc	obrokshare	oatyield	popdens1858	moscowdist	latitude	longitude
serfperc	1.0000						
obrokshare	0.1345	1.0000					
oatyield	0.1770	0.0609	1.0000				
popdens1858	0.0301	0.0111	0.3736	1.0000			
moscowdist	-0.4610	-0.4661	-0.2287	-0.2202	1.0000		
latitude	0.1623	0.5678	0.2091	-0.0833	-0.4790	1.0000	
longitude	-0.3332	0.2949	0.0262	-0.1390	0.0135	0.2753	1.0000

Note 2: Latitude, longitude, and distance from Moscow variables were constructed from the information on the location of district capitals in 1863 (assumed to represent the entire district), as provided in Russia, Ministerstvo (1863) and supplemented by Google Maps. The distance to Moscow was calculated as the arc distance to the district capital. The oat yield variable (seed ratio) comes from Russia, Ministerstvo (Vol. 1, 1900) and reflects mean values of the yearly reported data of local correspondents to the Ministry of Agriculture and State Property over the period 1884-1900.

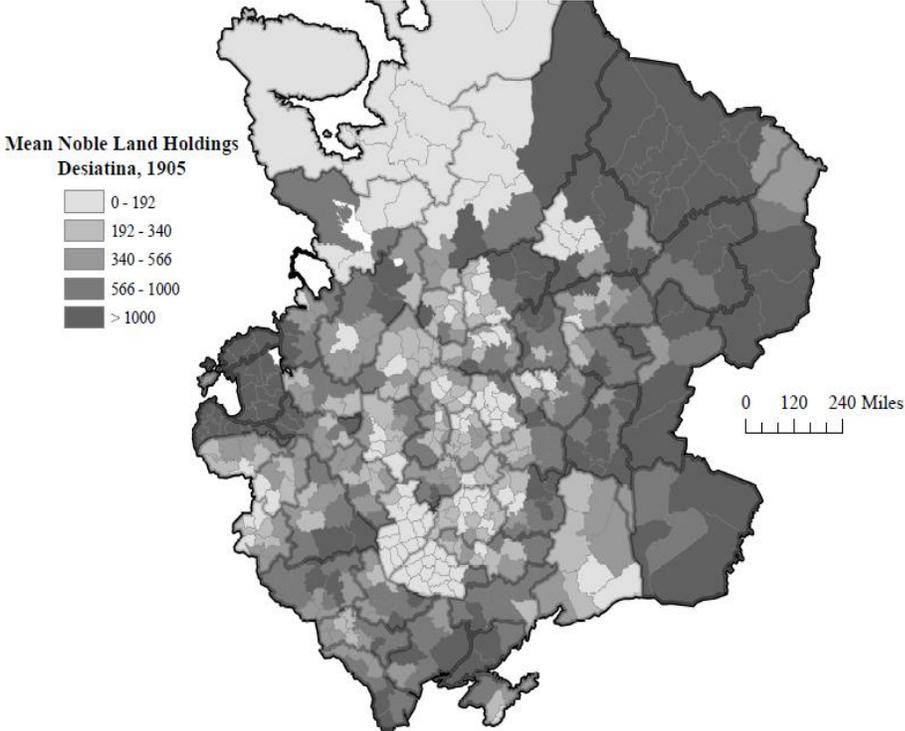
Table 4: Parsing Out the Variation in Serfdom – Extensions

Dependent Variables:	% Serfs, c. 1860	% Serfs on Quit-Rent Obligations only
Pop. Density, 1860 (sq. mile) Mean = 70.5, SD = 50.6	-0.077*** (0.012)	-0.0180 (0.0171)
Latitude	1.345 (1.284)	-0.00199 (0.0209)
Distance to Moscow (Kms) Mean = 587.5, SD = 305.8	-0.035** (0.013)	3.871* (2.192)
“Failed” Monasteries Mean = , SD	- 7.684*** (2.430)	-3.610 (4.175)
Observations	431	415
(Within) R2	0.104	0.033
Province Fixed Effects?	Yes	Yes

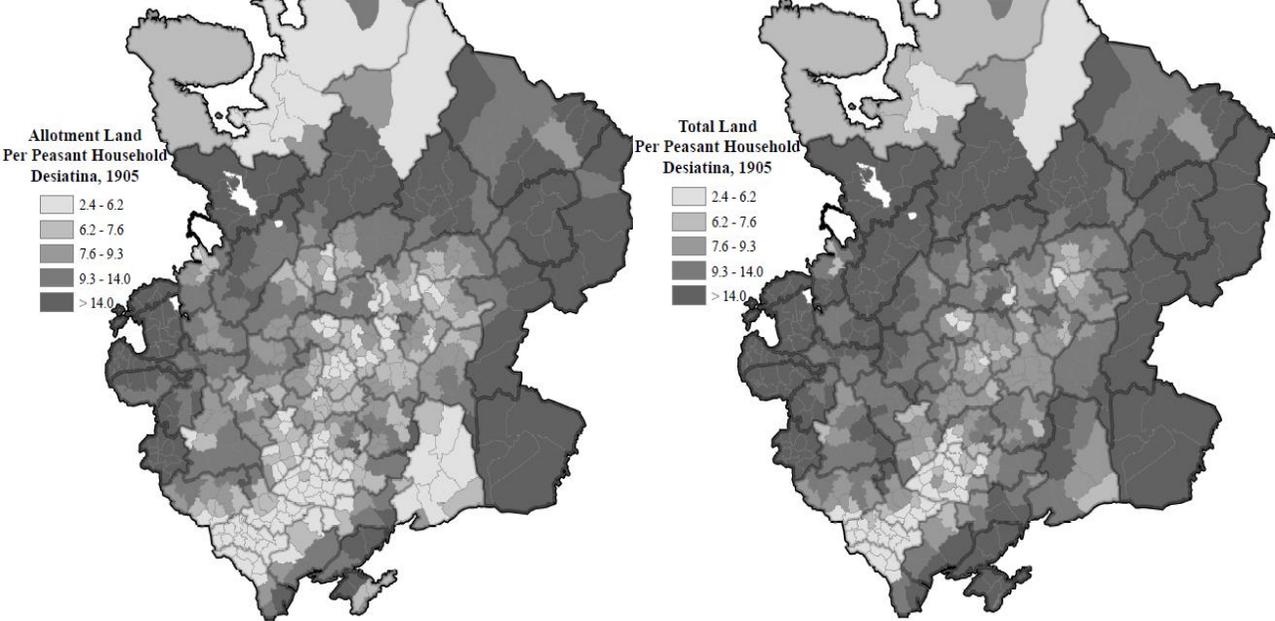
Note: The variables, sources, and sample restrictions are the same as in Table 3a. See Appendix Table 1 and other tables for additional summary statistics. Regressions are OLS with provincial fixed effects and constant terms. The “Failed” Monasteries variable is the number of monastic institutions (including convents), for which any evidence of their existence is available, which ceased operating prior to 1764. We compiled these counts at the district-level from the list reported in Zverinskii (2005 [1897]).

Figure 5: Endowment Implications of the Land Reform Process

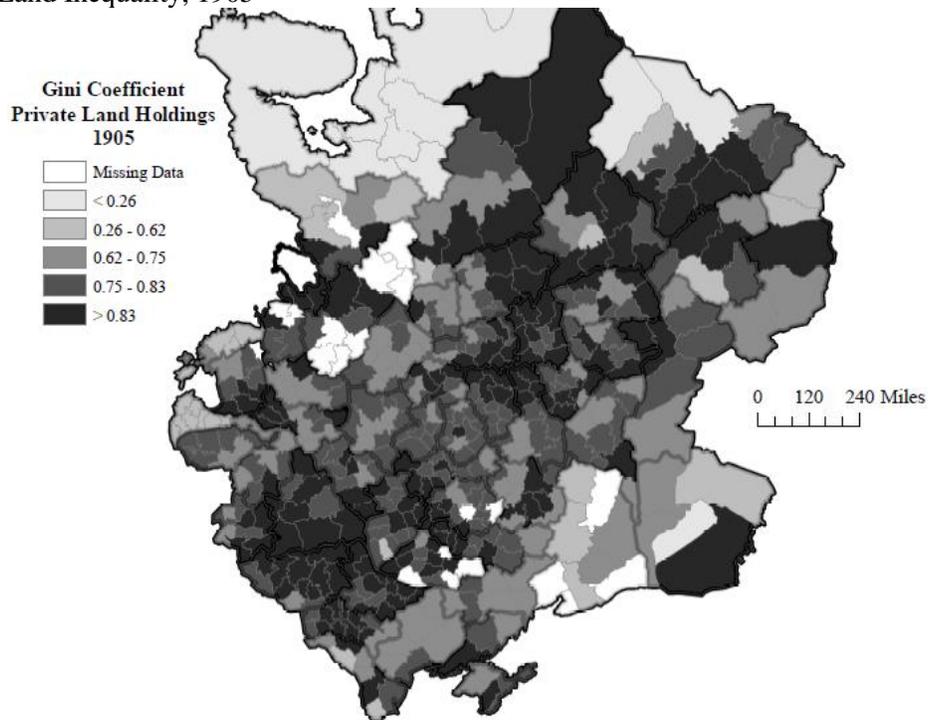
(a) The Size of Noble Estates, c. 1905



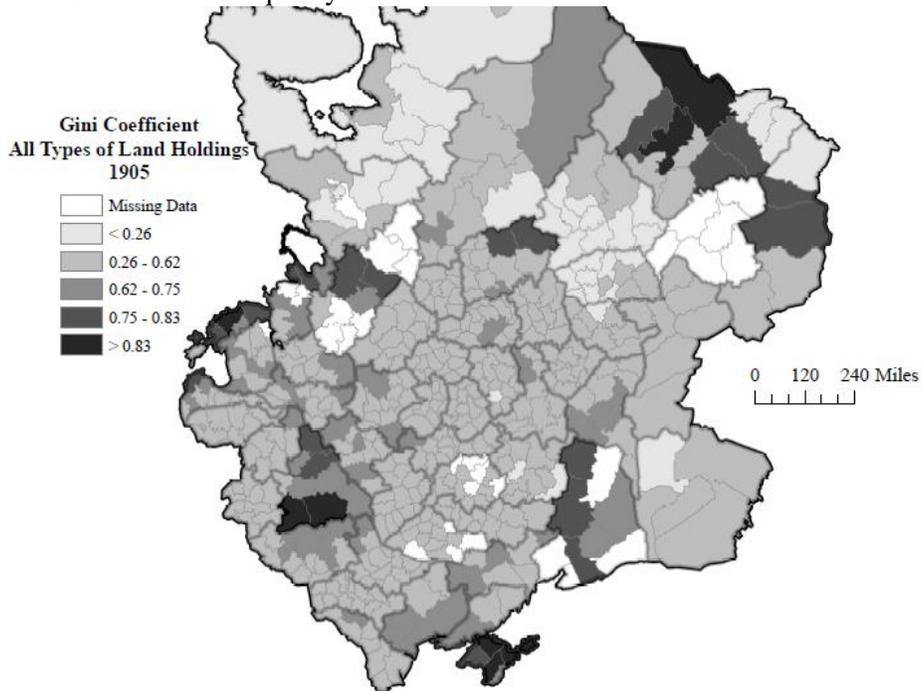
(b, i and ii) Peasant Landholdings, c. 1905



(c, i) Private Land Inequality, 1905



(c, ii) Private + Allotment Land Inequality



Note: See text and Appendix Table 1 for more information on these variables. The values of each variable increase as the shading darkens. White areas reflect missing or non-applicable data. Land areas are defined in *desiatina* (1 *desiatina* = 2.7 acres). The source for all data is Russia, Tsentral'nyi (1906).

Table 5: Redemption Payments and Property Taxes – The “Price” of Endowments

Variables	Mean	SD	Min	Max	N
<b>A. Land Redemption Payments</b>					
Yearly redemption assessment per <i>desiatina</i> , 1883 <i>Former serfs only, pre-lowering</i>	1.79	0.50	0.51	2.92	367
Yearly redemption assessment per <i>desiatina</i> , 1886 <i>Former serfs only, post-lowering</i>	1.31	0.48	0	2.40	368
Yearly redemption assessment per <i>desiatina</i> , 1886 <i>Former state peasants only</i>	0.86	0.44	0.04	4.05	395
Accumulated redemption payment arrears by 1895 In districts where % serfs in 1850s > %50	71.96 64.85*	121.52 107.04	0 0	946.2 514.6	450 200
<i>All types of peasants, 100 x % of yearly assessment</i>					
<b>B. Tax Obligations (Without Redemption Payments)</b>					
Total tax assessment per <i>desiatina</i> , 1895, all types of peasants In districts where % serfs in 1850s > %50	1.41 1.81*	0.81 0.69	0.03 0.63	7.74 3.46	498 200
Accumulated tax arrears by 1895, all types of peasants In districts where % serfs in 1850s > %50 <i>100 x % of yearly assessment</i>	76.36 54.63*	100.03 72.87	0.18 0.18	607.7 346.5	498 200
Total tax assessment per <i>desiatina</i> , 1903, all types of peasants In districts where % serfs in 1850s > %50	1.42 1.72*	0.94 1.09	0.05 0.12	26.78 13.72	498 200
Accumulated tax arrears by 1903, all types of peasants In districts where % serfs in 1850s > %50 <i>100 x % of yearly assessment</i>	12.18 9.32*	14.91 12.89	0.08 0.09	120.5 114.7	498 200

Note: These data are observed at the district level. The tax assessments are defined as rubles per *desiatina* of peasant allotment land. The data from before and after 1883 are from Russia, Tsentral'nyi (1885 and 1886a). The 1886 data were compiled from Khodskii (1891, vol. 2). The data on redemption arrears from 1895 are drawn from Russia, Departament (1897), while the tax data from that year come from Russia, Departament (1902). The 1903 tax data are from Russia, Departament (1909).

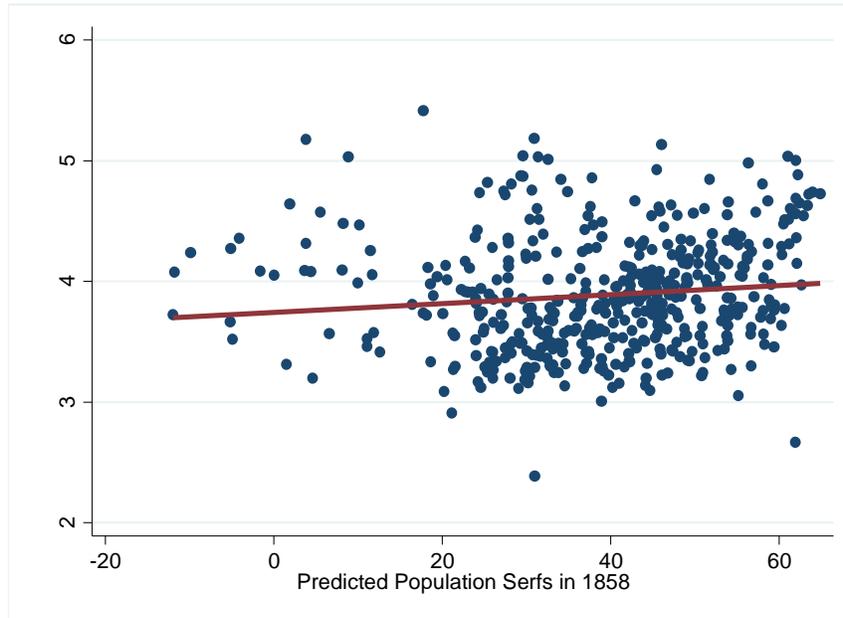
Table 6: Serfdom, Emancipation, and Factor Endowment Variation in Late Imperial Russia

Dependent Variable:	% $\Delta$ in Nobility's Land Share, 1877 - 1905				Total Land ( <i>desiatiny</i> ) per Peasant HH in 1905			
% of Serfs <i>Of population, c. 1860</i>	0.176*** (0.023)	0.138*** (0.026)			-0.174*** (0.056)	-0.046 (0.027)		
% of <i>tiagla</i> on quit-rents <i>Exclusively obrok, c. 1858</i>			0.011 (0.035)				-0.026** (0.013)	
% of serfs on large estates <i>Males, c. 1858</i>				-0.117** (0.044)				-0.035** (0.015)
Observations	483	483	424	376	492	492	430	376
R <sup>2</sup> (overall)	0.243	0.142	0.074	0.137	0.337	0.239	0.397	0.346
Provincial Fixed Effects?	No	Yes	No	No	No	Yes	No	No
Additional Controls?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dependent Variable:	Gini Coefficient, Private Land Only, 1905				Gini, Private + Communal Land, 1905			
% of Serfs <i>Of population, c. 1860</i>	0.171*** (0.060)	0.112*** (0.029)			0.252*** (0.054)	0.363*** (0.039)		
% of <i>tiagla</i> on quit-rents <i>Exclusively obrok, c. 1858</i>			0.036* (0.019)				-0.094*** (0.026)	
% of serfs on large estates <i>Males, c. 1858</i>				0.101*** (0.032)				-0.038 (0.030)
Observations	477	477	415	362	468	468	407	359
R <sup>2</sup> (overall)	0.278	0.110	0.195	0.189	0.390	0.295	0.457	0.423
Provincial Fixed Effects?	No	Yes	No	No	No	Yes	No	No
Additional Controls?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dependent Variable:	Yearly Redemption Payment per <i>Desiatina</i> Among Former Serfs, pre-1883				Total Arrears / Yearly Redemption Obligations, 1895			
% of Serfs <i>Of population, c. 1860</i>	0.002 (0.001)	-0.000 (0.001)			-0.395 (0.417)	-0.112 (0.266)		
% of <i>tiagla</i> on quit-rents <i>Exclusively obrok, c. 1858</i>			0.004*** (0.001)				-0.359 (0.614)	
% of serfs on large estates <i>Males, c. 1858</i>				-0.002 (0.002)				0.525 (0.350)
Observations	366	366	352	338	445	445	425	365
R <sup>2</sup> (overall)	0.628	0.450	0.717	0.674	0.351	0.192	0.329	0.303
Provincial Fixed Effects?	No	Yes	No	No	No	Yes	No	No
Additional Controls?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dependent Variable:	Total (Non-Redemption) Peasant Tax Obligations per <i>Desiatina</i> , 1895				Total Non-Redemption Tax Arrears / Total Tax Obligations, 1895			
% of Serfs <i>Of population, c. 1860</i>	-0.001 (0.006)	0.005*** (0.001)			-0.385 (0.277)	-0.130 (0.177)		
% of <i>tiagla</i> on quit-rents <i>Exclusively obrok, c. 1858</i>			0.006*** (0.001)				-0.264 (0.356)	
% of serfs on large estates <i>Males, c. 1858</i>				0.001 (0.002)				0.235 (0.221)
Observations	489	489	427	373	489	489	427	373
R <sup>2</sup> (overall)	0.286	0.238	0.620	0.581	0.302	0.165	0.342	0.297
Provincial Fixed Effects?	No	Yes	No	No	No	Yes	No	No
Additional Controls?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

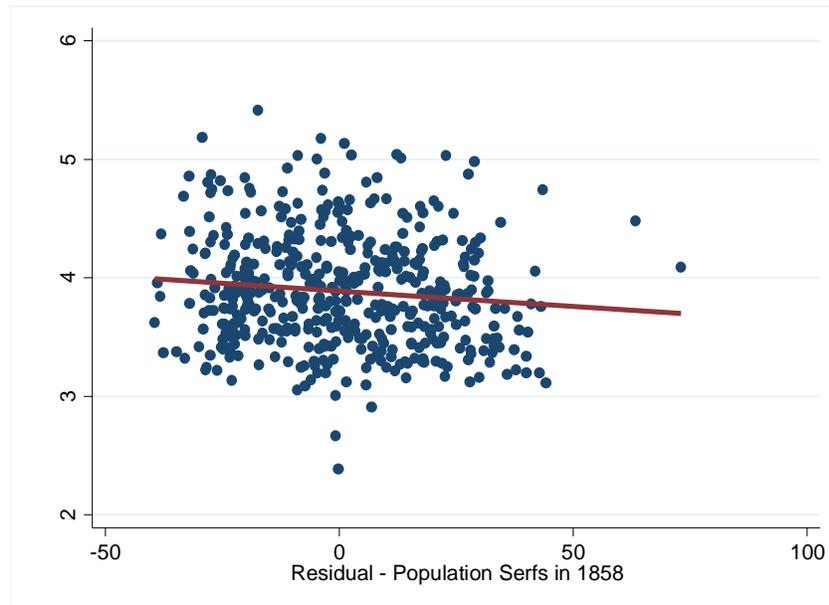
Note: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Specifications are at the district level. Robust and clustered standard errors are in parentheses. All regressions are OLS with or without provincial fixed effects. Sample sizes vary due to missing data and the non-applicability of several controls to parts of European Russia without serfdom. Quit-rent and “large estate” specifications are weighted regressions where the weights are the shares of the population who were serfs, c. 1860. “Additional Controls” include latitude and longitude of the district seat, the share of land that was arable, the share in forests, and the population density in 1863, 1894, or 1904. Percentage and arrears / lowering variables are in percentage points. Gini coefficients are multiplied by 100. Payments are in rubles. Variables are summarized in Table 2, Table 5, and Appendix Table 1.

Figure 6: The Correlation Between Serfdom (c. 1858) and Rural School Funding in 1911

i) Role of Observable Determinants of Serfdom



ii) Role of “Unobservable” Determinants of Serfdom



Note: The “Predicted” and “Residual – Population Serfs in 1858” are derived from a regression of the share of the population who were serfs in 1858 on latitude, distance from Moscow, and whether a district had black earth soil. The school expenditure data are in Ln(Kopeks per capita) and were compiled from the volumes of Pokrovskii, ed. (1916).

Appendix Table 1 – Additional Summary Statistics for District-Level Data

	N	Mean	SD	Min	Max
Latitude, measured in main district towns, decimal conversion	499	54.05	3.85	44.5	68.87
Longitude, measured in main district towns, decimal conversion	499	54.66	8.44	38.83	81.3
Total land per peasant household in <i>desiatiny</i> , 1905	500	12.38	8.93	2.50	176.31
<i>In those districts with % serf in 1850s &gt; %50</i>	200	10.01*	4.66	2.98	34.60
Percentage communal allotment land (of all owned land), 1877	487	37.6	21.7	0.4	92.1
Percentage communal allotment land (of all owned land), 1905	500	36.5	25.8	0.1	96.2
Percentage land owned by nobility (of all owned land), 1877	487	22.5	19.1	0	70.5
Percentage land owned by nobility (of all owned land), 1905	500	13.9	15.4	0	72.8
Gini coefficient, private land holdings only, 1877	480	0.80	0.13	0	0.98
Gini coefficient, private land holdings only, 1905	481	0.77	0.14	0	0.98
Gini coefficient, private + communal holdings, 1905	472	0.47	0.15	0.00	0.90
<i>In those districts with % serf in 1850s &gt; %50</i>	197	0.54*	0.11	0.29	0.85
<u>Other Variables for Empirical Work</u>					
Percentage of land defined as arable, 1881	495	42.10	22.12	0	83.58
Percentage of land defined as forests, 1881	495	27.62	19.82	0	97.6
Population per Square Mile, 1911	500	132.02	151.76	0.35	2670.8
Change in share of urban population (x 100), 1913 – 1863	495	1.34	5.53	-18.28	45.66
Agricultural share of the population (x 100), adult males, 1897	501	71.36	15.08	0.94	94.60
Rural primary enrollment rate (x 100), 1911	501	21.20	6.40	3.12	55.51
Total spending per capita on primary schooling (kopeks), 1911	493	54.30	28.82	10.76	223.13
Skill Premium (100 x Teacher / Agricultural Laborer Salary), 1910-11	450	309.28	81.81	80.30	685.57

Note: Latitude and longitude are taken from historical information presented in Russia, Ministerstvo (1863), with corrections made using Google Maps. In this table, the 1877 and 1905 land statistics are from the provincial volumes of Russia, Tsentral'nyi (1906). See Appendix Tables 3 and 4 for additional information from this source and from the original 1877 volumes. The 1881 land characteristics are drawn from Russia, Tsentral'nyi (1886b). The 1911 population density is defined from data presented in Russia, Tsentral'nyi (1912), while the change in the urban population share is derived from information in Russia, Tsentral'nyi (1866 and 1914). This latter variable is defined as the percent in 1913 minus the percent in 1863. Other population density variables were employed in the models of Tables 5 and 6 where appropriate – summary statistics and sources are available upon request. The agricultural share of the adult male population (in terms of primary occupation) is defined from the provincial volumes of the 1897 census (Troinitskii, ed., 1905). The 1911 primary school enrollment, spending, and teacher salary information is provided (mean across all teachers) in Pokrovskii, ed. (1916), while the salary information for a yearly agricultural laborer (mean of male and female workers) is taken from Russia, Tsentral'nyi (1913). The enrollment rate assumes that the school-age population is 20 percent of the total. Further details on the sources and methods used to construct these variables are available upon request. Means and standard deviations are weighted to represent the entire sample where appropriate in the top part of the table. The bottom variables are simple means across districts. The symbol \* indicates that the subsample mean is statistically different from the rest of the sample at the 95% significance level. Also see the text and notes below several tables above. Note that the bottom half of the table provides summary statistics for variables employed here and in the broader project.

Appendix Table 2: The Dynamics of the Serf Population, 1720-1858

Provinces	Total Population, 1858	Serfs ( <i>krepost'nie liudi</i> )			
		Total Population Share, c. 1745 (II Revision)	Total Population Share, c. 1782 (IV Revision)	Male Population Share, c. 1835 (VIII Revision)	Total Population Share, c. 1858 (Xth Revision)
Arkhangel'sk	284082	0	0	0.1	0.01
Astrakhan	264374	0.09	2.9	3.7	4.71
Bessarabia	957133	.	53.3	2.1	1.04
Chernigov	1471866	56.7	48.9	44.9	37.61
Ekaterinoslav'	934139	27.6	38.8	39.3	33.09
Estliand	303478	84.6	85.7	0	0
Grodnno	881881	.	56.4	48.4	40.05
Iaroslavl'	976866	67.4	69.9	66.9	56.45
Kaluzha	1007471	80.3	76.6	69.0	57.14
Kazan	1543344	14.2	17.5	16.7	13.79
Khar'kov	1583571	52.5	45	34.3	29.75
Kherson	1114248	12.5	40.4	38.6	28.83
Kiev	1944334	.	81.2	68.8	57.66
Kostroma	1076988	68.2	66.8	65.4	57.31
Kovno	988557	.	.	42.9	36.89
Kurliland	754725	.	46.5	0	0
Kursk	1812035	54.8	41.2	46.4	38.67
Lifliand	897603	78	70.8	0	0
Minsk	987471	.	72.5	62.6	60.55
Mogilev	884640	.	75.3	70.7	64.63
Moscow	1599808	51.7	59.2	51.7	38.42
Nizhegorod	1259606	68	68	66.8	57.58
Novgorod	1134078	54.8	49.6	48.1	43.05
Olonets	287354	0.5	5.5	5.4	3.92
Orel	1532034	67.3	60.4	56.3	46.87
Orenburg	914308	1.4	12.4	13.8	2.66
Penza	1188528	59.2	57.2	53.5	45.92
Perm	2046481	53	44.8	30.9	18.64
Petersburg	1053975	33.6	37.5	53.5	24.23
Podol'sk	1748466	.	75.5	61.4	59.49
Poltava	1819110	44.4	45.7	41.6	37.47
Pskov	706462	68	70.3	60.3	53.81
Riazan	1427299	69.9	69.8	63.5	55.45
Samara	1530039	.	.	.	15.25
Saratov	1636135	9.9	.	42.4	40.19
Simbirsk	1140973	45.9	50.3	44.5	38.78
Smolensk	1102176	72.9	74	73.4	68.82
Tambov	1910454	43.1	43.7	47.7	39.00
Taurida	687343	.	0	6.6	5.97
Tul'a	1172249	.	76.6	75.4	68.53
Tver	1491427	.	59.1	57.9	50.63
Ufa	1597577	.	.	.	7.03
Viatka	2123934	2.3	2	2.6	1.74
Vilno	876116	.	44.4	52.2	45.60
Vitebsk	635021	.	65.3	63.6	57.06
Vladimir	1207908	64.5	63	62.6	56.99
Vologoda	960593	33.1	29.5	26.4	22.40
Volyna	1528328	.	77.7	64.0	56.53
Voronezh	1930859	21.8	36.4	35.2	26.79
Don Cossacks	945576	2.4	23.5	32.3	21.50
Totals / Means	59863023	51.7	64.7		36.39

Note: The overall means for the II, IV, and VIII Revisions include some serfs outside of European Russia. The sources are as in Table 1 for 1858, Kabuzan (2002) for 1745 and 1782, and Keppen (1857) for 1835.

Appendix Table 3 – 1877 District-Level Land Statistics: Additional Indicators

Panel A: Allotment Land	N	Mean	SD	Min	Max
Total land (with an “owner”), 1877	487	656986	972414	116172	1.43 x 10 <sup>7</sup>
Total peasant communes, 1877	487	282.4	184.8	3	1102
Total peasant hhs, 1877	483	16765	8802	453	67151
Total allotment land, 1877	483	201615	149612	1846	1260967
Former serf hhs, 1877	483	8209	5435	0	36010
Former state peasant hhs, 1877	483	7873	7946	0	53111
Allotment land per peasant hh, 1877	483	12.06	6.08	0.462	119
Among former serfs	467	9.242	5.15	0.37	67.22
Among former state peasants	475	14.85	7.29	0.633	178.4
<i>Where both peasant types present:</i>					
Among former serfs	459	8.87	5.04	0.37	67.22
Among former state peasants	459	13.95	6.52	0.633	178.4
"Communal" allotment hhs, 1877	483	12987	9920	0	47931
"Household" allotment hhs, 1877	483	3778	6484	0	67151
% "communal" allotment land, 1877	483	79.13	34.84	0	100
"Communal" allotment / hh, 1877	418	12.28	5.59	0.462	118
Former serfs	395	8.74	2.94	0.462	29.91
Former state peasants	389	15.76	7.22	1.78	178.4
"Household" allotment / hh, 1877*	396	11.12	7.90	0.481	66.23
Former serfs	336	10.71	8.84	0.37	76
Former state peasants	343	11.55	7.12	0.633	69.22
<i>Where both allotment land types present:*</i>					
"Communal" allotment / hh, 1877	331	11.35	5.17	2.36	39.51
"Household" allotment / hh, 1877	331	12.58	8.61	0.481	64.54

Panel B: Private Land	N	Mean	SD	Min	Max	Mean % Arable	% of Private Land
Total privately owned land, 1877	486	183777	187324	0	1755243		
Number of private land owners, 1877	486	994.1	959.3	0	5758		
Private land / owner, 1877 (all)	484	184.9	1335.9	0.28	240921	25.8	
Owner = nobility	477	640.3	3578.0	5	332907	25.7	80.5
Owner = merchant	462	724.8	3271.3	0.5	164029	17.4	10.4
Owner = townsman	452	33.2	70.1	0.1	1757	32.8	2.0
Owner = peasant (individual)	465	20.1	35.4	1.17	7005	31.9	7.2
Owner = peasant (commune)	279	164.8	314.7	1	5308	n/a	
% Peasant hhs = private owners, 1877	479	3.48	5.26	0	97.6		
% Communes = private owners, 1877	487	3.37	6.58	0	71.1		

Note: HH means household. Data are not available from one province (Don Cossack Land) and a few other scattered districts. All land areas in *desiatina* = 2.7 acres. “n/a” means data was not available. Total Land in Panel A includes state-owned land and various other institutional holdings not included in “private” property of Panel B. Unless otherwise stated, the totals and percentages in Panel A include former court peasant households / allotments, but not other groups categorized as peasants (foreign colonists; nomadic populations; etc.). The % Private Land is out of these four categories, with the two peasant classes summed together. Variables marked with \* drop one district containing a small number of former court peasants with exceptionally large landholdings. “Communal” refers to *obshchestvennyi* allotments; “household” refers to *podvornoe* – see the text for additional commentary. The data are compiled from Russia, Statisticheskii (1880-1885). For related 1877 statistics, see Appendix Table 1.

Appendix Table 4 – 1905 District-Level Land Statistics: Additional Indicators

Panel A: Allotment Land	N	Mean	SD	Min	Max
Total land (with an "owner"), 1905	500	761296	1669503	115334	2.96 x 10 <sup>7</sup>
Total peasant communes, 1905	477	358.6	282.8	13	1755
Total peasant hhs, 1905	500	23984	13656	127	86091
Total allotment land, 1905	500	247741	243461	3000	1807030
Former serf hhs, 1905	477	12008	8555	0	60194
Former state peasant hhs, 1905	477	11248	11051	0	54037
Allotment land per peasant hh, 1905	477	10.19	7.72	2.46	143.7
Among former state peasants only	464	12.46	8.58	0.82	143.4
<i>Where both peasant types present:</i>					
Among former serfs	438	7.02	3.63	0.23	42
Among former state peasants	438	10.78	5.69	0.82	91.62
"Communal" allotment hhs, 1905	476	19317	15445	0	84640
"Household" allotment hhs, 1905	476	5725	10443	0	64483
% "communal" allotment land	476	83.3	33.8	0	100
"Communal" allotment / hh, 1905	410	10.99	8.81	0.18	143.4
Former serfs	380	6.83	2.40	0.05	63.78
Former state peasants	390	13.22	9.19	0.4	143.4
"Household" allotment / hh, 1905	297	7.46	4.51	0.21	57
Former serfs	241	6.43	3.92	0.16	57
Former state peasants	265	8.85	3.86	0.82	33.3
<i>Where both allotment types present</i>					
"Communal" allotment / hh, 1905	231	8.90	5.46	0.18	63.6
"Household" allotment / hh, 1905	231	9.87	7.96	0.21	57

Panel B: Private Land	N	Mean	SD	Min	Max	% of Private Land
Total privately owned land, 1905	500	203189	216400	0.1	1869788	
Number of private land owners, 1905	500	1652	1918	2	15172	
Private land / owner, 1905	500	122.97	785.2	0	101275	
Owner = nobility	492	494.9	2746.2	4	184062	56.9
Owner = merchant	453	542.2	2330.2	2	321807	12.5
Owner = townsman	443	43.8	64.0	1	1403	3.8
Owner = clergy	390	35.1	66.1	0.1	787	0.33
Owner = peasant (individual)	473	27.1	49.1	0.9	1265	14.2
Owner = peasant (association)	429	144.3	160.1	9.1	4317	8.2
Owner = peasant (commune)	371	211.1	412.5	1	10314	4.0
% Peasant hhs = private owners, 1877	500	4.08	7.28	0	90.2	
% Communes = private owners, 1877	477	10.16	12.67	0	93.9	

Note: HH means household. A number of observations are missing or undefined, especially for the Baltic provinces. This explains the lower number of observations in Panel A than were apparent in Appendix Table 3. All land areas in *desiatina* = 2.7 acres. Total Land in Panel A includes state-owned land and various other institutional holdings not included in “private” property of Panel B. Unless otherwise stated, the totals and percentages in Panel A include former court peasant households / allotments, but not other groups categorized as peasants (foreign colonists; nomadic populations; etc.). “Communal” refers to *obshchestvennyi* allotments; “household” refers to *podvornoe* – see the text for additional commentary. The data are compiled from Russia, Tsentral’nyi (1906). For related statistics from 1905, see Table 2 and Appendix Table 1.

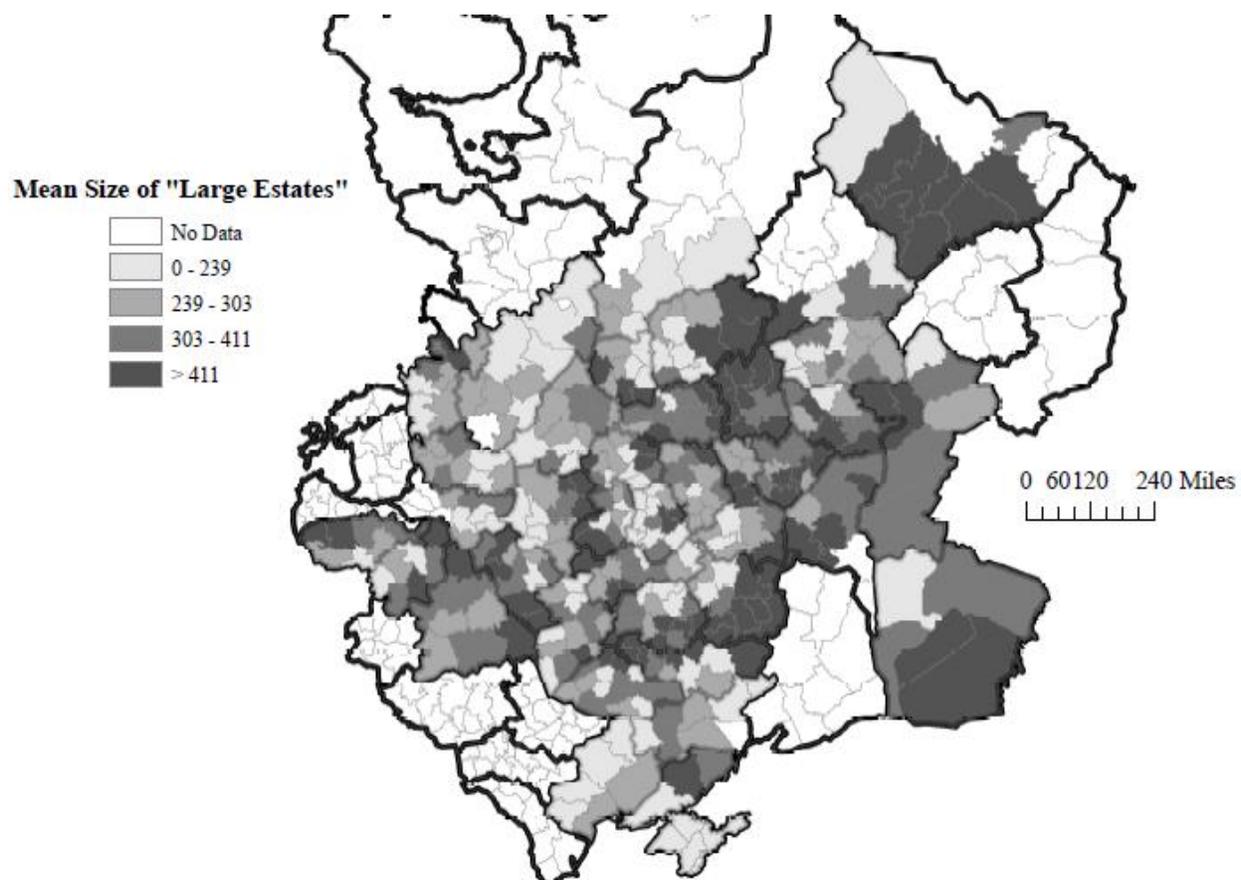
Appendix Table 5 – Raw Correlations of Endowment Variables (Defined from 1905 Land Statistics)

	1	2	3	4	5	6	7
1 % Serf Population Share	1 495						
2 Large Serf Estate Size (Souls), 1850s	0.1184* 0.0233 367	1 367					
3 Mean Noble Property, 1905	-0.0366 0.4171 494	0.7579* 0 367	1 500				
4 Mean Peasant HH Property, 1905	-0.4528* 0 494	0.0384 0.4636 367	0.0971 0.0299 500	1 500			
5 Mean Peasant HH Allotment, 1905	-0.3839* 0 494	-0.0559 0.2853 367	0.0551 0.2189 500	0.779* 0 500	1 500		
6 Gini Coefficient Private Land, 1905	0.3611* 0 479	0.0711 0.1825 353	-0.1259* 0.0057 481	-0.1994* 0 481	-0.175* 0.0001 481	1 481	
7 Gini Coefficient Private+Allotment Land, 1905	0.3134* 0 470	0.1379* 0.0098 350	0.1859* 0 472	0.0004 0.9933 472	0.1737* 0.0001 472	0.2302* 0 472	1 472

Format:	Correlation Coefficient
	Statistical significance
	Observations

Note: See the text, Table 2, and Appendix Tables 1 and 4 for additional detail on these variables and their sources. Each row entry (except #1) lists the correlation coefficient, the level of statistical significance, and the number of observations.

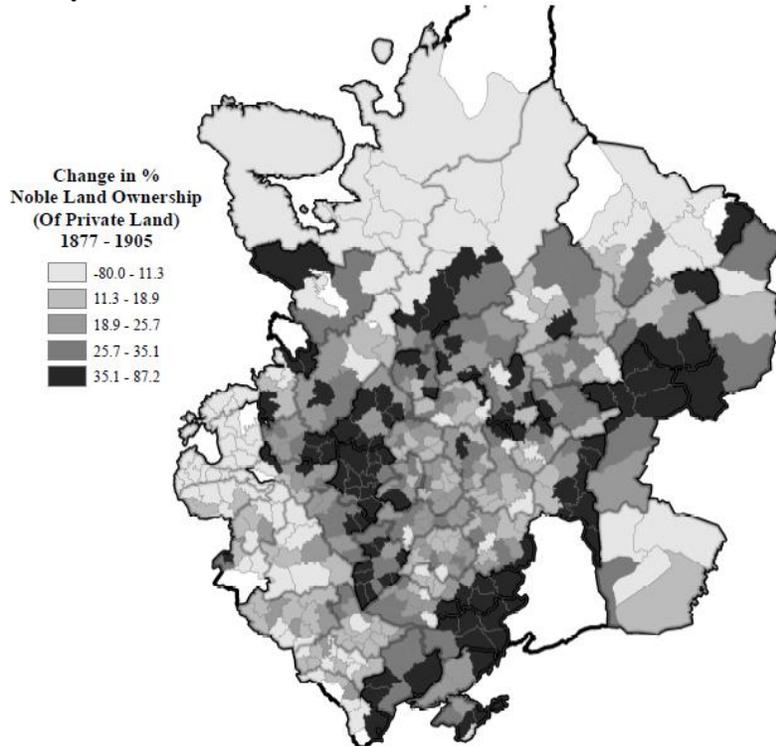
Appendix Figure 1: The Size of "Large Estates"



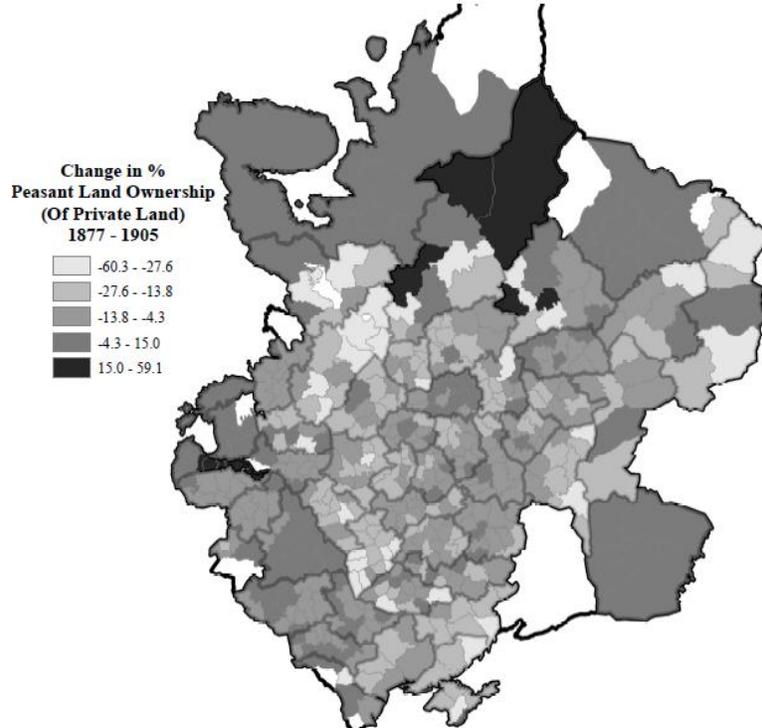
Note: The figure presents the district (*uezd*)-level means of the size of large estates, c. 1858, as measured by the number of male souls. White colored districts reflect either the absence of data or the non-applicability of the indicator. See Table 2 for sources.

Appendix Figure 2: Changes in the Shares of Privately Owned Land, 1877 to 1905

i) The Nobility

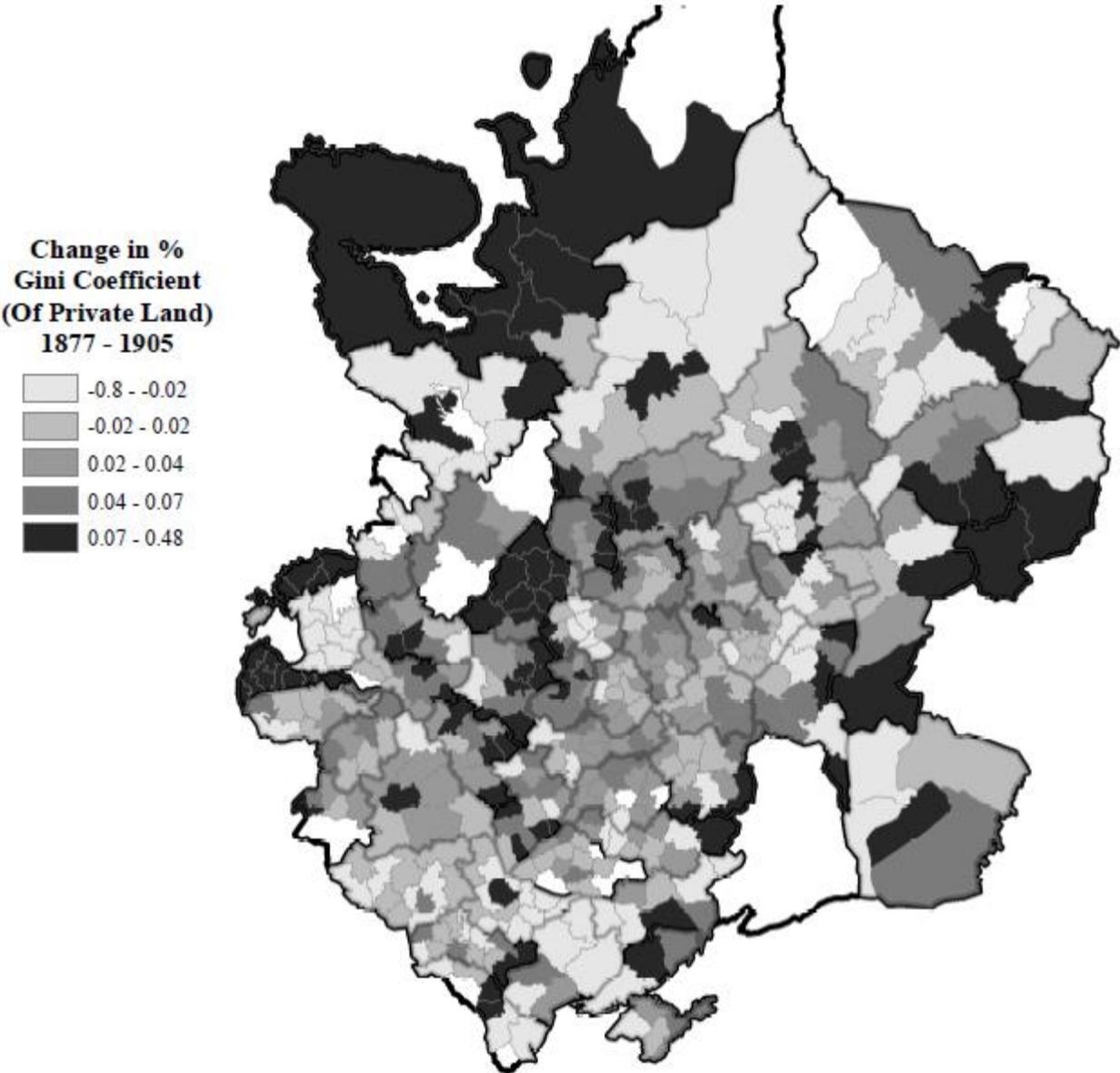


ii) The Peasantry (Individuals and Communes)



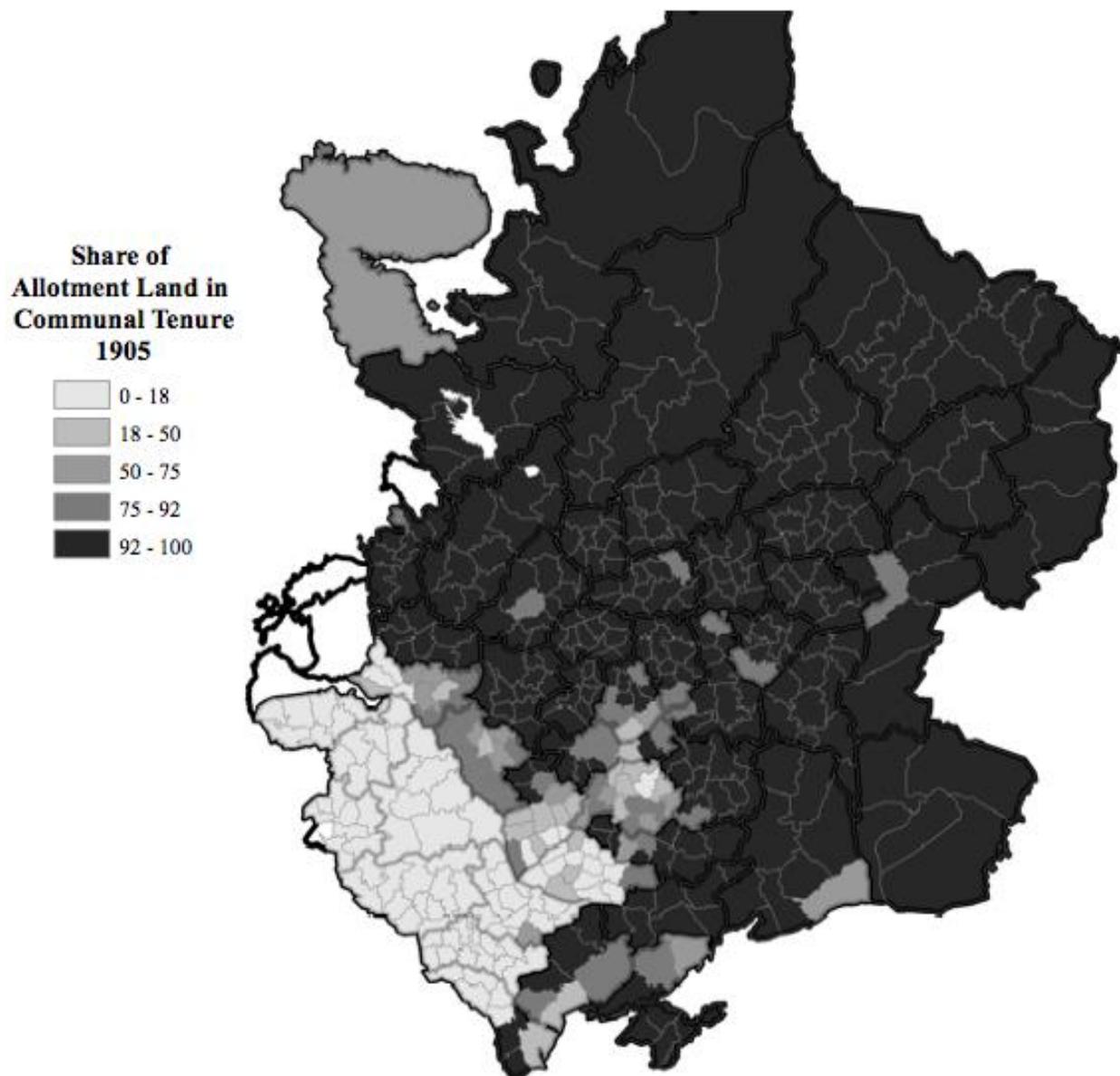
Note: The data are taken from Russia, Statisticheskoe (1880-1886) and Russia, Tsentral'nyi (1906). The data are percentage point changes in the share of privately (non-allotment / non-state) owned land by the two social classes. The peasantry includes individual owners and land owned by communes outside of the allotment land.

Appendix Figure 3: Changes in the Private Land Gini, 1877 to 1905



Note: Underlying data are the district-level changes in the Gini coefficient (ranging from 0 to 1) of private land holdings across all social classes and types of owners from 1877-1905. These distributions were taken from the volumes in Russia, Statisticheskoe (1880-1886) and Russia, Tsentral'nyi (1906).

Appendix Figure 4: The Distribution of Communal (*Obshchestvennaia*) Allotment Land



Note: Underlying data the share of total allotment land across all peasant types held in *obshchestvennaia* tenure in 1905. These were taken from the volumes of Russia, Tsentral'nyi (1906).