Russian Peasants and Politicians: The Political Economy of Local Agricultural Support in Nizhnii Novgorod Province, 1864-1914

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January, 2013

Abstract

This paper explores the local political economy of early agronomic efforts in Tsarist Russia by undertaking a two-part analysis of the role of the *zemstvo* – a 19th century institution of local self-government – in improving local agricultural conditions. First, we investigate the agronomic activities of various levels of government in Russia over the last fifty years of the Tsarist era. After discussing the relatively limited role played by the central ministries and peasant institutions of self-government, we follow Nafziger (2011) in undertaking a qualitative and cross-district empirical analysis of how variation in economic conditions and the political structure of the *zemstvo* assemblies may have motivated *zemstvo* expenditures on agriculture. This exercise finds evidence suggesting that the peasantry – the population most likely affected by agronomic efforts – had an influence on the policies of the *zemstvo*, despite rarely holding majority positions in the assemblies. To explore the mechanisms underlying these results, we turn to a case study of agricultural development and *zemstvo* policies in Nizhnii Novgorod province. We draw on archival records, contemporary publications, and newspaper accounts to document these factors, both at the provincial level and for one relatively non-agricultural district (Semenov). Our findings suggest that the policy preferences of the local elites and of leaders of the executive committees of the institution likely mattered more than the composition of the *zemstvo* assembly for the resulting outcomes. By shedding light on the political mechanisms behind local public support for agronomic efforts, this chapter makes an initial step towards a fuller account of the early stages of Russia's agrarian transformation.

JEL Codes: N33, N43, N53, O13, H41, H72

Keywords: Russia, agronomy, political economy, agriculture

INTRODUCTION

Did the Russian state help or hinder economic development in the pre-Soviet era? According to the classic formulation of Alexander Gerschenkron (1965), the Tsarist state stepped in an attempt to overcome Russia's backwardness. This entailed state credit and guarantees for industry, protective tariffs, and the borrowing of foreign technology. Significantly, Gerschenkron and other scholars have also viewed the state as using tax policies to siphon resources from agriculture to support industry. In part, this was done through the institution of the peasant commune, which also fostered restrictions on labour mobility out of agriculture and reduced incentives to improve land holdings. The result was rural stagnation – both in living standards and in agricultural productivity growth.

Recent work in Russian economic history has brought into question this traditional view of state policies with respect to the countryside. Rural living standards were likely higher than the older literature on agrarian "crisis" assumed (Dennison and Nafziger, forthcoming). The negative incentive effects of the commune may have been limited in practice (Kingston-Mann, 1991). Although less well documented, peasant tax burdens were likely less onerous than frequently asserted, and arrears were not escalating (Simms, 1977). That is not to say that the Russian countryside was incredibly well-off; by comparison to more advanced countries at the time, it was not. But the agricultural sector was beginning to embark on a path towards technological modernization in the contexts of global trade. Peasants were slowly adopting new crops, cultivation methods, artificial fertilizers, and machinery; agricultural credit markets were deepening; and the farm sector was increasingly connected to international grain markets. While rural Russia was slow to experience an agricultural transformation prior to 1917, this paper considers whether public agronomic policies – especially those undertaken by sub-national units of the Tsarist state – affected the pace and trajectory of rural development.

We explore this issue by examining the agricultural activities of the *zemstvo*, a local institution of self-government that was created by the Tsarist government in the Great Reforms of the 1860s. The body was established in roughly 2/3 of the districts and provinces of European Russia to support local administration and, explicitly, to encourage economic development. *Zemstva* (pl.) were granted latitude to set local property taxes and fund a wide variety of public goods and services. Moreover, the institution was constructed to include representation from the local property owners, including the newly emancipated peasantry. Exploring the cross-district variation in the electoral power among different property owners, Nafziger (2011) shows that those *zemstva* with greater peasant representation not only spent more per capita, but they charged lower tax rates on communal property *and* spent relatively more on primary education in the villages.

Did this link between the political structure of the *zemstvo* and its policies extend to agricultural support? The late 19th and early 20th centuries saw the emergence of public support for agriculture in a number of more advanced countries. The application of scientific principles to agricultural production did not always require public participation, as private returns were frequently quite high. But the social benefits of communicating new agronomic knowledge, of encouraging preventative measures against pests and livestock diseases, and of providing credit for land improvements and other investments generated a possible role for the public sector,

especially at the sub-national level. Therefore, despite low yields and incomes, local government-led efforts to overcome information problems and promote socially beneficial technology adoption may have played an important role in encouraging the agricultural growth that did happen in late-Tsarist Russia.

That endeavour constitutes the focus of this chapter. After sketching the development of agriculture in late Tsarist Russia, we briefly outline the theory and comparative history of public support for agriculture in the late 19th and early 20th centuries. We then embark on a two-part analysis of the role of the *zemstvo* in improving local agricultural conditions. First, we investigate the agronomic activities of various levels of government in Russia over the last fifty years of the Tsarist era. After discussing the relatively limited role played by the central ministries and peasant institutions of self-government, we follow Nafziger (2011) in undertaking a qualitative and cross-district empirical analysis of how variation in economic conditions and the political structure of the *zemstvo* assemblies may have motivated *zemstvo* expenditures on agriculture. This exercise finds evidence suggesting that the peasantry – the population most likely affected by agronomic efforts – had an influence on the policies of the *zemstvo*, despite rarely holding majority positions in the assemblies.

To explore the mechanisms underlying these results, we turn to a case study of agricultural development and *zemstvo* policies in Nizhnii Novgorod province. We draw on archival records, contemporary publications, and newspaper accounts to document these factors, both at the provincial level and for one relatively non-agricultural district (Semenov). Our findings suggest that the policy preferences of the local elites and of leaders of the executive committees of the institution likely mattered more than the composition of the *zemstvo* assembly for the resulting outcomes. By shedding light on the political mechanisms behind local public support for agronomic efforts, this chapter makes an initial step towards a fuller account of the early stages of Russia's agrarian transformation.

LATE TSARIST AGRICULTURAL DEVELOPMENT

A slow process of structural change characterized economic growth in late Tsarist Russia. While aggregate economic growth was comparable to more developed economies over this period, income levels saw little convergence with the global leaders by World War I (Gregory 1994). However, Tsarist Russia exhibited the highest rate of agricultural output growth among the major European economies (2.2 per cent per annum between 1870 and 1914 – see Broadberry et al., 2010: 65). Allen (2004) interprets this agricultural record as the outcome of an unsustainable wheat boom, which resulted from the integration of the southern and Ukrainian black earth regions into global markets.

Agricultural development in the late Tsarist era took sharply different regional trajectories (Wheatcroft, 1991). Transportation improvements and improved labour mobility after serfdom led to regional specialization, with the central provinces showing far lower agricultural output growth than the Volga, Ukrainian, and southern provinces. The 'Central Industrial Region' around Moscow and extending into Nizhnii Novgorod province was known for the high level of non-agricultural work. Specialization was evident within the agricultural sector as well, as the northern provinces such as Vologda and Novgorod were increasingly focused on dairying and various forms of mixed farming.

Despite evidence of aggregate growth, Gerschenkron, Allen and other scholars (including pro-'Westernizing' contemporary writers) have long emphasized the fundamental limitations on agricultural productivity imposed by the peasant commune, especially as it was reinforced by the reforms of the 1860s. In this interpretation, the commune's collective impositions on household property rights discouraged the use of soil fertilizers, other land improvements, the adoption of new technologies and production methods, and the exit of surplus labour. Low levels of investment and technological differences resulted in persistently lower yield levels on peasant allotment land (*nadel'naia zemlia* – the land allocated in the emancipation reform process) than on private holdings. This is evident in Table 1, which summarizes yields data on communal and private land for the two main crops of European Russia – rye and oats. Within these property categories, the high standard deviations indicate the substantial differences in agricultural productivity across European Russia.[1]

[Insert Table 1 about here]

The apparently low productivity of Russian peasant agriculture before 1917 has also been blamed on aspects of the culture or belief systems of rural Russia. According to Kerans (2001), peasants purposefully ignored better practices and show little interest in productivity improvements. He and others (especially Marxist and conservative contemporary writers) have argued that such a peasant mentality limited the ability of outside experts to convince peasants of the unsuitability of their ways. Such a perspective was evident among the responses to the 1893 survey in Nizhnii, with the gentry landowner A. P. Topornin noting that improvements in productivity required 'light (knowledge) and resources – neither of which are evident among the peasantry' (quoted in Shmidt, ed., 1893: 2). However, this same source goes on to note that peasant production methods – even in this seemingly backward province (Table 1) – were beginning to change in a number of ways, including cultivation practices, crop choice (especially the use of the potato), improvements in the quality of seeds, and other dimensions.

What was the role of the Russian state in encouraging or discouraging these and other elements of agricultural development? Gerschenkron (1965), Von Laue (1969), and Soviet scholars asserted that Tsarist fiscal policies shifted resources from agriculture to support industry, although there is little evidence that the agricultural sector was especially tax disadvantaged. Leonard (2011) has recently concluded that the Tsarist regime was repeatedly interested in 'agrarian reform,' but its efforts were ultimately undermined by political and fiscal circumstances in times of crisis. In general, the central government did relatively little to directly support agriculture in the pre-Soviet era.[2] Early on, there were some indirect efforts, such as the establishment of a variety of agricultural schools and academies under the auspices of the Ministry of Education and the founding of the Peasant and Noble Land Banks in the 1880s. These may have had productivity effects, but the available evidence suggests that the central government's fiscal involvement in such affairs was fairly limited or at least not growing as a share of the total central budget until the very end of the period. Expenditures on the various agricultural ministries included relatively little direct funding for agronomic efforts – probably less than 5% of the budgeted amount for the relevant ministries (Kaufman, 1886; Lokot, 1908; and Sapilov, 2001).

The 1891 agricultural crisis and famine in the central agricultural regions did lead to some growing interest in agrarian conditions among Tsarist officials. An assistant minister of the interior, Viacheslav Pleve, argued for more activist government support of agriculture in the early 1890s, including broadening the activities of state credit institutions and the explicit financing of agronomy. Subsequently, a special conference on rural economic conditions was called under the chairmanship of Sergei Witte, the former prime minister (Macey, 1987). The Stolypin land reforms were the culmination of this rising interest in agricultural development. Although these measures did not involve a large use of fiscal resources, some efforts were made to develop agronomic programs (Efremenko, 1996).[3] As a result, the period from 1905 to 1914 saw greater support of a small number of experimental stations (mostly outside European Russia), specialized research institutes, display farms, and agricultural experts in St. Petersburg (Matsuzato, 1996; Russia, Glavnoe, 1908).

By 1917, Russian agriculture had reached the limits of extensive growth (Allen, 2004). The shift of agricultural production to the more productive southern provinces had mostly run its course as the development of the railroad network slowed. The Stolypin reforms, while possibly easing some institutional constraints on productivity growth, did not eliminate the commune. The previous several decades had seen the growing adoption of mechanization, new tools, seeds, artificial fertilizers, and advanced crop rotations by peasant and non-peasant farmers in all parts of the Empire.[4] The result was slowly increasing yields and output growth despite the apparent slowdown in labour and land input growth. In the face of possible cultural and institutional constraints, and limited central government support until quite late in the period, what was driving this slow process of agricultural modernization? This chapter emphasizes the important role that local, publically financed agronomic efforts played in the uptick in Russian agricultural productivity in the last decades of the Tsarist regime.

WHY (LOCAL) PUBLICALLY FUNDED AGRONOMY?

The mechanisms of how and why peasant farmers in developing countries adopt new production technologies are often unclear and may be related to either some unknown heterogeneity or market imperfections (e.g. Suri, 2011). Relatively poor and risk adverse farmers may view the costs of new technologies as exceeding the uncertain benefits. Moreover, the possible positive spillovers from adoption – whether through the transfer of new knowledge to neighbours or via other mechanisms – may lead farmers to not make the socially optimal level of investment in new technologies. Imperfections in credit, input (often due to concentration of suppliers), or output markets may raise the perceived or actual costs for potential adopters. Finally, even for those farmers who might adopt, accessing new knowledge about technologies might be prohibitively difficult in environments where education levels are low and transportation and communication costs high. All of these factors create a role for public sector institutions to play in reducing costs and incentivizing private investments to approach the socially optimal level of adoption. According to T.W. Schultz (1964), Robert Evenson (2001), and others, public support for agronomy is especially critical in spurring agricultural modernization in developing economies due to the scale of market imperfections, the distance between actual and best practice techniques, the low level of human capital.

Agronomic programs include government efforts at promoting technological change, disseminating the resulting knowledge about new techniques and production methods, and

supporting the adoption of advanced crops, inputs, and machinery. State funding of scientific research is generally justified by reference to standard R & D externalities, particularly when experimentation generates uncertain results and there are large indivisibilities in creating new technologies (Evenson and Kislev, 1976). Public support of a network of research stations and experimental farms may be especially necessary when agro-climatic conditions are heterogeneous and (local) private returns to innovation are relatively limited. Public extension – separate but often linked to research – aims to bridge the gap between actual and current best practices, the latter of which evolves with technological change. This entails various methods of advancing agricultural knowledge among producers (especially among users of traditional techniques) and lowering the costs of adoption for interested farmers. In funding education; enabling easier communication between innovators, technology suppliers, and farmers; and even subsidizing adoption, government expenditures on extension have been shown to generate high social returns (Evenson, 2001; Sunding and Zilberman, 2001).

High social returns help explain the demand for public spending on agronomy, but the supply is driven, at least in part, by the underlying political incentives. In standard public choice models, pressure groups for and against utilizing fiscal resources for agricultural purposes interact within a given political structure. The outcome of this political process determines the level of funding allocated towards agronomy (Rose-Ackerman and Evenson, 1985). Critically, if the externalities involved are relatively local, decentralized forms of government may provide more efficient levels of agronomy services because the authorities may be more responsive to (or have preferences more in line with) those affected in the local population (Bardhan and Mookherjee, 2006; Huffman and McNulty, 1985). However, the underlying political process behind public agronomy programs may suffer from problems of capture by interest groups (perhaps even more so at the local level), the use of allocated funds may not be adequately monitored, and outcomes from such spending may not be measurable, which could weaken political support. If government power – democratic or not – is concentrated in the hands of urban elites or large estate owners who would see limited benefits from agronomy spending, then the level or allocation of spending may not maximize social welfare (Swinnen at al., 2000). Such issues are relevant in developed economies like the United States and, perhaps even more so, in poorer and less politically developed countries like Tsarist Russia.

By the mid-19th century, the United Kingdom, the United States, and advanced parts of Europe saw the emergence of agricultural associations, private experimental farms, and literatures dedicated to disseminating new approaches (Grigg, 1981; Street, 1988). These efforts did not directly rely on scientific advances; rather, they drew on trial and error to evaluate what worked, and then the new knowledge disseminated via purely private means. However, as the production frontier came to increasingly be defined by scientific developments over the 19th and early 20th centuries, these mechanisms for research and knowledge transfer gave way to state-sponsored efforts, reflecting greater indivisibilities in research and growing gaps between best and actual practices.

This transition first occurred in the United States with the founding of the Department of Agriculture in 1862, the Hatch Act of 1887, and the establishment of land grant universities and state-level research systems. By the end of the century, the U.S. became the world leader in agricultural technology due to the combined efforts of central (the USDA) and local (at the state

or county levels) public institutions and private sector producers aided by a highly developed education system (Ferlerger, 1990; Huffman, 2001; Olmstead and Rhode, 2008). Germany saw similar efforts in the late 19th century, and most European states supported experimental farms and research stations by the early 20th century.[5] Public funding for knowledge transfer came later. In the U.S., many states created extension systems to transfer new findings to farmers in the late 19th century, but federal funding only emerged from 1913 onwards. In Europe, public extension only arose in the interwar and post-World War II periods (Grigg, 1981). The growth of state support for agronomy helped generate higher agricultural productivity growth in the late 19th and early 20th century in these developed economies, a trend that continued through the Green Revolutions in parts of the developing world after World War II (Evenson, 2001).

THE POLITICAL ECONOMY OF AGRONOMY: THE *ZEMSTVO* IN LATE-TSARIST RUSSIA

Early agronomic efforts in Russia arose in provincial agricultural societies, the state-sponsored Free Economic Society, and experimental efforts of large estate owners during and after serfdom (Elina, 2002). Low incomes, serfdom, institutional constraints, and market imperfections limited the effects of these private initiatives. As outlined above, the central government was relatively uninvolved with specific efforts at transferring new technologies and other aspects of 'scientific agriculture' to the countryside. There was nothing approaching a Russian USDA until the 20th century, and even then, most centrally funded agronomy was connected with the special conditions of the Stolypin land reforms (Pallot, 1999). Otherwise, most public (i.e. tax financed) initiatives were left to local authorities.

This potentially included the institutions of peasant self-government – rural societies (the administrative version of the commune) and townships – that levied dues on members, and provided some very local public services. The contributions of rural societies to schooling were fairly substantial, and these may have had indirect effects on agriculture. However, the amount specifically spent on agriculture by either institution represented relatively small investments in productivity improvements, with almost 2/3 of total spending on agricultural objectives going towards renting land and hiring personnel to watch over livestock.[6] Collective action problems and limited resources likely discouraged more significant agricultural support by communes and townships. Therefore, public support for agronomy was left to the district and provincial *zemstva* – new institutions created in the 1860s to explicitly draw on local fiscal revenues to improve economic conditions. The activities of this intermediate level of government likely incorporated externalities of agricultural research and extension within a policymaking framework that gave at least limited political voice to the peasantry.

The establishment of the *zemstvo* created a mechanism for collecting local property taxes *from all types of property owners* (unlike levies within the peasant institutions) and utilizing the funds for local purposes. At the district and provincial levels, the institution consisted of elected assemblies (*sobraniia*) that met once a year and executive committees (*upravy*) responsible for day-to-day activities. Thirty-four provinces and over 350 districts possessed *zemstva* for most of the post-Emancipation period, with six more provinces gaining the institution in 1910, and the rest of the Empire acquiring them over the next few years before the Bolsheviks dissolved them in 1917.

Under the initial law, assembly seats in each district were allocated to three groups of property owners: private rural land owners, urban property owners (including factories), and peasant communes.[7] Elections occurred every three years, and the number of seats assigned to the communes varied from district to district depending on a variety of criteria, including the distribution of land and the presence of eligible members of the urban and landed 'curiae.' As Nafziger (2011) documents, the allocation of seats to the peasantry rarely resulted in an electoral majority outside of a few so-called 'peasant *zemstva*' provinces in the north. An 1890 reform reframed these three curiae of voters according to social class, limited the peasants – even if they owned other property – to their own curia, and reduced the number of seats they received. Throughout the period, the district *zemstvo* elected representatives to the provincial assemblies.

The executive committees ran the day-to-day business of the *zemstvo* according to policies ratified by simple majorities in the yearly meetings of the assembly. Some budget allocations were obligatory under the law, such as support for local courts and other administrative bodies. Beyond these responsibilities, each *zemstvo* possessed substantial authority over the remainder of its budget. This included the right to set tax bases and rates (subject to some guidelines), and it also meant that the institution could undertake a variety of initiatives to encourage local economic development, such as road maintenance, education, medical care, food relief, and support for agriculture and local industry. Therefore, each *zemstvo* could pursue very different policies. In 1906, expenditures per capita ranged from 10-15 kopeks (100 kopeks per rouble) up to 5 or more rubles (Russia, Statisticheskoe, 1910). With per capita income levels lying somewhere between 100 and 125 rubles (Gregory, 1994), *zemstvo* spending often constituted a significant investment in local public goods and government services.

The structure of the *zemstvo* political system helps explain the variation in *zemstvo* budget policies. Differences in the distribution of property holdings, in urbanization levels, and in other idiosyncratic conditions generated considerable variation in the numbers of assembly seats allocated to different social classes under the two laws (*Polnoe*, 1865 and 1891). In turn, econometric evidence suggests that the composition of the assembly (and, possibly, the executive committees) impacted the allocation of funds towards different objectives. This may be seen in Table 2, which presents results from simple district-level ordinary least squares regression models relating expenditures per capita in 1877 and 1906 to the share of seats allocated to the communes under the relevant law, to provincial fixed effects, and to numerous control variables.[8] The results for 1877 do not suggest any special role of the composition of the assemblies for total spending or spending on any particular category, but after the reform of 1890, the share of seats held by the peasantry was positively associated with expenditures per capita on objectives of particular interest to this curia – education and economic encouragement, especially of agriculture. Although these results reflect correlations more than causal relationships, they do indicate that the decisions of the *zemstvo* assemblies may have been increasingly responsive to the demands of the peasantry.[9]

[Insert Table 2 about here]

What did these expenditures actually involve, and what explains the timing of the *zemstvo*'s growing involvement? Veselovskii (1909, vol. 2: 132) asserts that the critical initiative behind

zemstvo support of agriculture came with an 1876 communiqué issued by M. V. Neruchev, a member of the Moscow Agricultural Society, who called on the institution to 'spread agricultural knowledge and improve agriculture.' According to data from 1877, over 40 per cent of *zemstva* were already dedicating some expenditures to agricultural efforts, veterinary matters, or (in a few districts) aid to local handicraft production.[10] The most visible aspect of these undertakings was the hiring of agronomy staff members. By 1879, a district *zemstvo* (Verkhotskoe in Perm province) had hired a full-time agronomist (other *zemstva* had previously considered hiring agronomists). Over the next 25 years, most provincial *zemstva* hired agronomists, and roughly 235 districts had filled such positions by 1905 (ibid., 134). The subsequent decade of the Stolypin reforms saw a rise in the number of *zemstvo*-employed agronomists, as the central government began to directly employ some agronomists while also increasing support for local efforts to improve agricultural productivity (Efremenko, 1996).[11] Although Kerans (2001), Kotsonis (1999), and some contemporary writers have argued for small productivity effects of agronomic activities, their conclusions are mostly based on qualitative accounts rather than hard evidence.[12] Although it is true that agronomists faced thousands of peasant farmers and an enormous area to cover throughout the period, the very existence of such efforts was pioneering, especially in a relatively poor economy.

Besides hiring professionals to travel the countryside and provide instruction in seeds, tools, fertilizers, and other advancements to (primarily) peasant farmers, the *zemstva* were also involved from a relatively early date in other activities that could be classified as 'agronomy.' Table 3 provides a brief snapshot of such discussions and initiatives from across European Russia over the period.[13] Each of these items represents policies that were relatively common, at least by the 1880s. Especially prominent were proposals to purchase better seeds, tools, and machines and either sell or loan them at subsidized prices, or display them in a promotional fashion. Another common policy was the financing of agricultural schools to train farmers and future agronomists. These were often coupled with proposals to set up experimental or demonstration farms, as in Ustiug district of Vologda. These examples also hint at the early enthusiasm for agronomy among the northern provinces such as Viatka, Perm, and Vologda. These provinces were among those known to possess 'peasant *zemstva*,' and their particular interest is consistent with the results in Table 2.

[Insert Table 3 about here]

The examples provided in Table 3 are necessarily selective, but they do suggest how *zemstva* were increasingly involved in promoting local agriculture over the last decades of the Tsarist regime. The empirical results presented in Table 2 are consistent with the peasantry having some influence on the allocation of *zemstvo* funds – including those intended to support rural economic development – by the *zemstvo* after the reform of 1890. However, it is important to note that the districts that saw greater peasant representation may also have had either fewer non-peasants to resist such initiatives, or contained a *zemstvo* under the control of particularly liberal landed elite. To shed light on the mechanisms relating the *zemstvo*'s political structure to its resulting policies, we turn to a case study of the institution and agricultural change in Nizhnii Novgorod province.

AGRICULTURE AND THE *ZEMSTVO*: THE CASES OF NIZHNII NOVGOROD PROVINCE AND SEMENOV DISTRICT[14]

The province of Nizhnii Novgorod (hereafter, Nizhnii) lay astride the Volga River approximately 400 kilometres east of Moscow. The population of the province was just over 1.5 million by the end of the century, with approximately nine per cent residing in the city of Nizhnii Novgorod and a small number of other urban centres (Troinitskii, ed., 1905).[15] While the majority of the population was Orthodox Russians, there were substantial minorities of Muslim Tatars, Mordvins (a Uralic ethnic group), and Russian Old Believers, the latter predominating in the northwestern districts. Among the peasantry, who were approximately 92 per cent of the population in 1897 (ibid.), roughly 2/3 resided in former serf communities, with the other third in villages that had been obligated to the state or the Romanov family. Figure 1 depicts the province and its districts.

[Insert Figure 1 about here]

Economic activity in the province was quite varied (Evtuhov, 2011). Facilitated by its location along the Volga, the province was well known as a trade centre, with the famous Nizhnii fair bringing merchants and wholesale sellers together from across the Empire and abroad. Large-scale manufacturing was limited to a few factories prior to 1917, but a large number of settlements were well known for artisanal crafts (i.e. knives in Pavlovo, a town in Balakhina district; wooden spoons in Semenov district) or putting-out industries (such as leather and textiles in the western districts). Although Nizhnii is often classified as part of the Central Industrial Region, agriculture, lumbering, and fishing occupied the majority of the population.[16] In 1897, approximately 63 per cent of the adult male population had primary occupations in these sectors. This share was less than the mean across European Russia (roughly 72 per cent – see Troinitskii, ed., 1905). There was considerable variation across the province in the role agriculture played in the local economy, and this was linked to geography. The black earth soils of the southwestern districts of Sergach' and Luk'iankov generated average net revenues of over 6 rubles per *desiatina* (2.7 acres) in the late 1880s, and the local economy was dominated by farming and related craft industries. In contrast, in the north and western districts of Gorbatov and Semenov, where the land generated little more than 2 rubles in net revenues per *desiatina*, almost all peasants were involved in protoindustrial or handicraft work for all or much of the year.[17]

Overall, Nizhnii province showed slightly below average agricultural productivity in the last decades of the Tsarist period (Table 1). Soil fertility was relatively low and climatic conditions were not conducive to large-scale commercial grain cultivation outside of the southwestern districts. Winter rye and spring oats were by far the dominant crops in the province, with most cultivation occurring within the confines of three-field rotations. The extent of other crops – flax, potatoes, and others – varied according to geography and, to some degree, the ethnic identity of the local population. The central area of the province close to the city of Nizhnii Novgorod was well known for dairying, even under serfdom (Anon., 1858). Peasant property holdings were almost entirely based on the formally repartitional commune, although the size of allotments and the amount of peasant holdings of private land differed across districts. Arable land comprised about 70 per cent of the peasant allotments, while forests covered more than 50 per cent of private holdings in 1887 (Russia, Glavnoe, 1906: 88-89).

The ownership structure of non-*nadel* land evolved after 1861, as merchants, townsmen, and even peasants acquired holdings from the nobility throughout the period. At the same time, there was a slow shift away from crop cultivation in general, as market integration created more competition for relatively inefficient Nizhnii producers. The area planted in grains declined by about 15 per cent between the 1860s and 1890s in the province as a whole, while the decline was over 30 per cent in Semenov district from 1881 to 1899 (Russia, Departament, 1903; Russia, Tsentral'nyi, 1901).[18] At the same time, there were signs of some productivity improvements. According to data collected by the Nizhnii Statistical Committee from local correspondents, there was a slight upward trend in yields of rye and oats on peasant land in the province and in Semenov district after 1890 (*Prilozhenie*, various). The period also saw a steady rise in the adoption of the potato, as the acreage planted in the province more than tripled between 1860 and 1900 (Russia, Departament, 1903, 160-170).

In a study conducted by the Ministry of Agriculture and State Property, correspondents reported very little adoption of modern ploughs and cultivators by either peasants or private landowners in Nizhnii in the late 1890s. However, other observers noted significant changes in peasant technologies in the province over the period. The majority of respondents to a *zemstvo* survey in 1893 described the relative "immobility" of peasant production methods in the province (writing in response to the 1891 agricultural crisis), but some correspondents reported that a variety of new crops, artificial fertilizer use, and machinery were slowly becoming more evident (Shmit, ed., 1893). Furthermore, Evtuhov (2011) describes the emergence of local agricultural machinery production in the southeastern districts.

Given that Nizhnii was a relatively non-agricultural province, it would be surprising to see any particular emphasis on agricultural support among the *zemstva*. But the limited available evidence suggests that not only was agricultural productivity showing some signs of improvement, but also that provincial and district *zemstva* were increasingly involved in agronomy at roughly the same time (from the 1880s onwards). To explore this possibility, we consider the evolution of *zemstvo* activity across the province and in Semenov district in particular.

According to one recent study of the province, the *zemstva* (provincial and district) of Nizhnii Novgorod province were some of the most 'dynamic' in Russia (Evtuhov, 2011: 13). After its founding, the institution quickly became heavily involved in infrastructure, education, and healthcare in the province. In conjunction with scientists from St. Petersburg, the *zemstva* engaged in a massive property value assessment program in the 1880s to better define local tax assessments. Special sub-committees for economic and, eventually, agricultural projects were created in the 1890s; these reported on relevant matters back to the assembly for final decisions. Generally, the provincial assembly and executive committee took a leading role in proposing new initiatives and calling on the district *zemstvo* to support – financially and organizationally – new projects. This was the case for agriculture, even though the provincial *zemstva*, like most across Russia, was even more dominated by the landed gentry and urban elites (who may have benefited less from such spending) than the districts (see below).[19]

The Nizhnii *zemstvo* began its agricultural efforts as early as 1872 with discussion over establishing a veterinary academy in conjunction with the Simbirsk *zemstvo* (Nizhegorodskoe,

1873: 126-127). While this idea was not apparently acted upon, additional discussions of ways to promote agriculture occurred throughout the 1870s and 1880s. In 1882, the provincial assembly assigned 500 rubles for an exhibition of new tools. In 1889, the assembly voted to establish a commissioner for machines and tools and to 5000 rubles over three years to create a loan program (Sazonov, ed., 1896: 1259 and 1295). At the same time, an initiative was proposed and accepted to buy improved seed and provide it to 10 'good peasant farmers' to promote and then return to the *zemstvo* from their harvests (ibid.: 1321). The scale and scope of such efforts steadily increased after 1891 and into the 20th century with a flurry of interest in subsidizing machinery rentals to the peasantry, in distributing improved seeds, and in creating a series of promotional plots for new fodder grasses and artificial fertilizers (Cheshkhin, 1914). In 1901, the provincial *zemstvo* even proposed to borrow 100,000 rubles for agronomic efforts, although the Ministry of the Interior eventually forbade the loan (TsANO, 72.30.799). Staffing levels rose throughout the period. The first provincial agronomist was one Nikolai Mikhailovich Tkachenko, who was hired in 1894. In 1897, the assembly called on the district *zemstva* to hire an agronomist, and all of them did over the next decade Veselovskii (1909, vol. 2: 136).[20]

In terms of total expenditures per capita, Nizhnii's district *zemstva* almost exactly matched the mean level across European Russia (106 kopeks) in 1906, while the provincial *zemstvo* spent slightly less than that (58 versus 61 kopeks).[21] According to budgetary data compiled by Cheshikhin (1914), there was a rise in the share of expenditures at the district level after 1890, much of which came from growth in education expenditures. The provincial *zemstvo*, in turn, took over more of the healthcare costs and played a relatively large role in veterinary and agricultural activities (the latter categories were grouped under "economic encouragement," which also included efforts to promote handicrafts and fire prevention).[22] The long-run dynamics at the district level may be glimpsed in Figure 2, which presents total spending and the shares of the main budgets going to four important categories in Semenov district over the entire period.[23] *Zemstvo* administrative expenses (and other obligatory expenditures not included here) started out quite high but gave way to spending on various public goods and services. Health care and education spending rose steadily over the period, with the latter increasing sharply in the 1890s. Spending on veterinary matters and "economic encouragement" was quite low, saw a small increase around 1898, and then began to increase after 1907.

[Insert Figure 2 about here]

Table 4 describes spending in 1903 and 1913 by the two levels of Nizhnii *zemstva* on different components of 'economic encouragement.'The provincial *zemstvo* was critical in supporting local agricultural societies and a committee dedicated to coordinating agronomic efforts across the province, while also heavily promoting handicrafts. In other respects, the district and provincial *zemstva* were both engaged in projects to encourage productivity growth, including the employment a variety of specialists.

[Insert Table 4 about here]

The various ways that the Nizhnii *zemstva* acted to support agricultural development using public funds may also be seen in the budgets excerpted in Tables 5 (the provincial *zemstvo* in 1898) and 6 (Semenov in 1900 and 1905). The commitments of the provincial *zemstvo* to

agronomy is evidenced by the expenditures on an experimental farm, agricultural education and training, pamphlets and other communications to peasantry, and agronomic personnel, who travelled the countryside talking to farmers prior to the establishment of the district agronomist positions. The history of the policies underlying many of these expenses extended back into the 1880s, while by the late 1890s, the central government evidently showed greater support for provincial efforts. The excerpts from Semenov budgets show more limited spending, but the very existence of any such efforts was perhaps remarkable given the mostly non-agricultural district economy.[24] Indeed, the breadth of these efforts – from warehousing advanced tools and seeds (for display and loaning out), to encouraging fodder and cultivation experiments, to providing credit, to supporting (and eventually paying) agronomists – places Semenov firmly in the national trend towards expanding local agronomic efforts. The two budgets in 1900 and 1905 show the process of growing local government involvement through the hiring of a district-level agronomist and the expansion of credit programs.

[Insert Tables 5 and 6 about here]

Were the peasants – as the main potential beneficiaries of such spending – especially influential in the Nizhnii *zemstva*? The legislated shares of seats assigned to the peasant curia in the province varied from 30 per cent in Nizhnii Novgorod district to 45 per cent in Sergach under the original law. After the 1890 reform, the percentages varied from 27 (Balakhna) to 33 across the districts (Semenov). Not only did the shares decline in all eleven districts, but the raw correlation between the share of assembly seats held by the peasantry and spending levels was negative after 1890.[25] In the electoral cycle of 1883-1886 (when data on the social class of assemblymen are available), very few peasants were sent from districts to sit on the provincial assembly: seven of eleven sent none and only Semenov sent close to their share in the district assembly (two of five).[26] Thus, the minority positions of the peasantry in the legislative assemblies of the *zemstva* would seem to suggest a relatively limited political role for this group. However, there were other possible mechanisms leading *zemstva* to impose local property taxes and to spend funds on agronomy and other initiatives that primarily benefited the peasantry.

One such mechanism involved the agenda-setting power of the executive councils and, especially, their chairmen. These bodies wrote the reports, executed policies on a day-to-day basis, and, critically, often proposed initiatives in the assembly meetings. In Nizhnii in 1883, peasants held a surprisingly large share of district *zemstva upravy* positions: 14 out of 35, which included two of three positions in Ardatov, Makar'ev, Semenov, and Sergach districts (Syrnev, ed., 1888). The possible authority that resulted was evident in the budgets and assembly minutes produced by Nizhnii provincial *zemstva.* As indicated in Table 5, the starting points for provincial budget discussions were proposed by the *upravy*. This committee worked closely with special sub-committees, including an economic and an agricultural one created in the late 1890s (Nizhegorodskoe, 1898). In Semenov's assembly of 1906, almost every item up for discussion was only put for a vote once the long-standing *uprava* chairman – a nobleman by the name of N. M. Lepivtsev – had proffered his viewpoint (Semeonskoe, 1906). As Table 7 suggests, peasants only occasionally found themselves as chairmen of this *uprava* (1868-1872), but in almost every year, they took up one or more of the other positions on the committee.

[Insert Table 7 about here]

Another explanation for the widening of *zemstvo* initiatives lies in the preferences of the non-peasants in the assemblies. According to scholars of the Nizhnii *zemstvo*, the growing interest in agronomic and other spending to promote local economic development was indicative of an emerging liberal mind-set among some local elite who became especially influential in the assemblies (Andreevich, 1999; Evtuhov, 2011). Examples of statements by such assembly members abound in the minutes of Semenov and the other *zemstva* in the province. In the 1906 Semenov assembly, the nobleman V. N. Listov asserted that the population would 'suffer a loss if there was no agronomist.' N. M. Lepivtsev argued that not only did the 'popular masses' turn to the agronomist to ask for council, but the benefits came at little cost. A. S. Rekshinskii, a non-peasant urban property holder, emphasized the importance of aiding the scientific advancement of local agriculture by continuing to fund a district agronomist (Semenovskoe, 1906: Day 2). The results in Table 2 are consistent with this elite preference explanation if similarly 'liberal' districts were also those where the peasants were typically assigned a larger share of seats in the assembly.[27]

Not every assemblyman was supportive of expanding funding for agronomy. Some of the landed and urban elite exhibited more stereotypical conservatism, arguing, in essence, that the use of funds to support agronomy was of little net benefit to themselves. Others such as A. A. Demidov, who was one of the largest landowners in the province, asserted that agronomy was ineffective because, 'the peasant farm is worked according to subsistence rather than economic terms' (Nizhegorodskoe, 1898, 83). Perhaps even more significantly, the assembly reports provide examples of the peasants themselves asserting that expanded agronomy efforts would be of little use. For example, I. N. Gogolev of Semenov claimed that peasants conversing among themselves best transferred agricultural knowledge. In the same meeting, another peasant curia assemblyman – K. E. Peredumin – argued that the more 'careful' farmers already knew about fodder grasses and advanced cultivation methods, and there was little need for additional expenditures on agronomists (Semenovskoe, 1906, Day 2). This lends further support to the importance of *non-peasant* policy preferences that, along with growing funding from the central government, generated support for agronomy in the last decades of the Tsarist era.

CONCLUSION

Even when the Nizhnii assemblies were not willing to fund particular proposals, the discussions often revolved around standard economic justifications for agronomy. The externalities of relating knowledge regarding new seeds, tools, and crops; the distribution of experimental and promotional plots to account for soil and climate variation; the need for improving credit and subsidizing the adoption of new technologies – these and other quite modern considerations formed the substance of debates in these and other *zemstva* of late-Tsarist Russia. Although central authorities began to show more interest in promoting agricultural change after the crisis of 1891-2, they invested relatively few resources in such efforts and, when they did increase funding, they channelled much of it through the *zemstvo*. Although available evidence is too limited to directly test for a connection between agronomy spending and agrarian development, there was a telling coincidence in the timing of rising *zemstvo* spending, technological change among peasant producers, and crop yield growth. This was evident in Nizhnii Novgorod province, and it was likely true for the rest of European Russia.

Was it optimal to leave substantial agricultural research and extension support to the *zemstvo*? On the one hand, tighter connections between the fiscal authorities and the underlying constituents may have improved monitoring and made it easier to express local preferences over the level and focus of public expenditures. Such reasoning undergirds justifications for policy decentralization in a variety of contexts. With peasants possessing a new political outlet (even if limited), and with growing interest among at least some more liberal local elite, pressure to expand public services was rising throughout Russia. On the other hand, the district and perhaps even the province may not have been the appropriate level to internalize agronomic externalities. The absence of an active USDA-like central authority may have hindered the transformation of the Russian agricultural sector by limiting the coordination of research and extension efforts across provinces. This chapter has focussed on the evident and perhaps surprising successes of locally driven agronomy, but the precise implications for Russia's economic trajectory remain to be investigated.

As numerous chapters in this volume emphasize, institutions play a critical part in the process of agrarian transformation. Whether financial intermediaries in Tanzania (Hillbom), slavery in the Cape Colony (Fourie), or property rights in River Plate (Willebald), production incentives in the face of price changes and market development are frequently driven by the institutional structures of a society. As these and other chapters in this volume suggest, such structures cannot be exclusively studied at the aggregate or macroeconomic level. Indeed, the relatively early emergence of widespread agronomic efforts in Tsarist Russia indicates the particular value of considering the microeconomics of *local* political institutions when studying agricultural change in less developed economies.

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Table 1: Summary Evidence on Russian Grain Productivity, 1881-1894

Mean Yields, 1881-1894	Rye		Oats	
	Private Property	Peasant Allotments	Private Property	Peasant Allotments
European Russia (N = 493)	6.18	5.15	8.55	7.22
SD	*1.21*	*1.04*	*1.57*	*1.33*
Central Industrial Region (N = 81)	6.36	5.2	8.72	7.57
SD	*0.95*	*0.70*	*1.49*	*1.17*
Nizhnii Novgorod (N = 11)	5.96	5.36	7.67	6.85
SD	*0.41*	*0.43*	*0.70*	*0.65*
Semenov district (N = 1)	5.25	4.75	7	6.5

Note: The source of these data is Russia, Ministerstvo zemel' (1900, vol. 1). The yields are seed ratios reported by district correspondents to the central authorities each year during the period. Yields were commonly reported in units per land area only beginning in the 1890s. The means are weighted by the share of peasant land under cultivation.

Table 2: District Cross-Sectional Correlates of Per Capita *Zemstvo* Spending, 1877 and 1906

	1877				1906			
	Total	Medical	Education	Agriculture	Total	Medical	Education	Agriculture
	1	2	3	4	5	6	7	8
3rd (peasant) curia assembly seat share	-0.339	0.150	-0.0264	-0.000923	0.677	0.0443	0.244*	0.0789*
From 1864 or 1890 Laws	(0.257)	(0.123)	(0.0666)	(0.00554)	(0.552)	(0.139)	(0.136)	(0.0425)
Observations	351	350	329	299	358	358	358	358
Other controls – 1	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other controls – 2	No	No	No	No	Yes	Yes	Yes	Yes
R^2 (overall)	0.22	0.05	0.19		0.093	0.114	0.065	0.073
Log Pseudolikelihood				-197.6				

Note: The dependent variables are kopeks of per capita expenditures in total or by category. Models are OLS with provincial fixed effects except for #4, which is a probit. The results for model 4 are marginal effects evaluated at the means of the variables. 'Other controls – 1' includes the share of arable peasant land, a dummy for the presence of the provincial capital, the urban population share, the shares of peasant and of noble land in 1877 or 1905, and the natural log of total land area to control for any scale effects on the supply or demand side. 'Other controls – 2' includes the share of adult males in agriculture, the share of the population born in another province, and a measure of local wages, all measured in the late 1890s. All variables are described and summarized in Nafziger (2011), and the sources are listed in Note 8. 'Agriculture' includes expenditures on a) veterinary matters, and b) economic encouragement. The latter included specific agricultural support and agronomic efforts, as well as efforts to encourage local industry. For most districts, the latter category was small (the currently available data are not broken down further. Constant terms are not reported.

Table 3: Examples of Agronomy Initiatives by *Zemstva*, 1868-1913

Province	District	Year	Agricultural Expenditure / Program
Viatka	Kotel'niga	1868	Assembly allocated 350 rubles for the sale of cheap seed and the renting out of new scythes.
Kherson	n/a	1876	Provincial assembly assigns 5000 rubles for the purchase of machines and tools to distribute to "experienced" farmers.
Iaroslavl'	n/a	1880	Provincial assembly provides an interest-free 2000 ruble loan to the local agricultural society to buy and display seed and machines.
Perm	Perm	1882	Executive committee chairman initiated effort to distribute improved seeds and rent out 30 new plows.
Vologda	Ustiug	1884	District assembly approves funds to buy land and establish an experimental farm and agricultural school.
Poltava	Zolotosha	1888	Assembly assigns 3000 rubles for the executive committee to encourage the spread of better tools.
Smolensk	Krasninsk	1893	Economic advisory board to the *zemstvo* decides to add phosphorous fertilizer to the grain warehouse.
Ufa	n/a	1900	First meeting of district agronomists in attended by numerous *zemstvo* agronomy professionals from Ufa province.
Moscow	n/a	1890s	Provincial *zemstvo* undertakes program to encourage new fodder grass crop rotation.
Bessarabia	n/a	1911	Provincial *zemstvo* sets up agronomy office to organize and evaluate agronomic work of district *zemstva*.

Sources: Bessarabia (1913), Khodskii (1887), Sazonov (1896), Ufimskii (1900), and Volin (1970). These examples were selected to be representative of the agronomic activities pursued by both levels of the *zemstvo* across European Russia.

Table 4: Decomposition of "Economic Encouragement" in Nizhnii Novgorod Province, 1903 and 1913

Components of "Economic Encouragement" Spending	Semenov		Provincial *Zemstvo*		All Nizhnii *Zemstvo*	
	1903	1913	1903	1913	1903	1913
Fire prevention measures	0	500	0	26100	300	30000
Grants to agricultural and scientific societies	0	0	2300	5200	2300	6700
Improving "natural" conditions (i.e. soil) of agriculture	200	100	3600	2000	7000	7600
Improving agricultural productivity (tools, seed, etc.)	500	9800	8400	38800	17700	303100
Improving market conditions for agricultural products	0	400	0	1000	0	2500
Development of local craft industries	0	0	38300	75900	40800	78500
Meteorological stations	0	0	0	0	0	600
Salaries of agronomic personnel and councils	1000	2000	14100	30100	18100	111900
Total	1700	12800	66700	179100	86200	540900

Source: Russia, Statisticheskoe (1908 and 1915). These numbers indicate rubles budgeted by *zemstvo*; these totals may have differed slightly from the amounts actually spent.

Table 5: Nizhnii Novgorod Provincial *Zemstvo* Budgeted Expenditures on "Economic Encouragement," 1898

Expenditure on "Economic Encouragement"	Committee Requested	Assembly Okayed
Support of Experimental Farm	5000	5000
1893 and 1895 zemstvo initiatives		
Support of agricultural school	5500	6000
1886 zemstvo initiative		
Support of applied training courses	6500	6500
"Extraordinary" zemstvo initiative of 1897		
Support of agricultural museum in capital	2465	2465
1884 and 1895 zemstvo initiatives		
Support of agronomy stations	1850	0
Proposed by executive committee		
Stipends for agricultural school	100	100
1887 zemstvo initiative		
Support for artisanal handicrafts	47820	38600
Various		
Salaries for agronomists and staff (handicrafts as well)	20090	19370
1893 and 1895 zemstvo initiatives		
Distribution of agricultural "knowledge" among peasantry	500	500
1895 zemstvo initiative		
Expenditures from special endowment on livestock for poor	21.28	21.28
By charter of endowment		
Total	89846.28	78556.28
Of total, from Ministry of Agriculture subsidies and receipts	40111.28	32111.28

Note: The numbers in parentheses reference the sources (legal or monetary) of the row above. "Committee" refers to the executive committee, or *uprava*, that conducted the day-to-day business of the *zemstvo*. The source of these data is Nizhegorodskoe (1898).

Table 6: Budgeted Expenditures on Agronomic Measures, Semenov District, Nizhnii Novgorod Province

From Ratified Budget for 1900, Semenov *Zemstvo*	Amount in Rubles
Out of "Expenditures on Economic Encouragement"	
Rent and upkeep on warehouse for seed, machinery, and fertilizer	80
Salary for watchman/administrator of warehouse	240
Organization of experimental plots for fodder grass	100
Support and provisions for travels of provincial agronomist in district	100
Distribution of agricultural books among the peasantry	25
Support for a "model peasant farm"	50
Subsidized sale of seed	100 (for 1901)
Total (1900 only)	595
From Ratified Budget for 1905, Semenov *Zemstvo*	
Category 4: Measures to Improve Productivity in Agriculture	
Rental/upkeep of warehouse space	40
Fodder experimental plots	79
Experiment with mineral fertilizer	150
Efforts at organizing multi-field cultivation efforts	250
Efforts at encouraging communal fodder cultivation	163.5
Agricultural brochures (printing)	7.5
Category 5: Salaries of Personnel	
Salary of agronomist	700
Salary of watchman for warehouse	300
Other Categories	
Credit for buying subsidized grain	1000
“Other” (in agronomy)	25
Total	2715

Note: These two excerpts of ratified *zemstvo* budgets are from Semenovskoe (1900 and 1906). The 1906 volume referenced the budgeted amounts (*smeta*) in the year prior.

Table 7: The Semenov Executive Committee (*Uprava*) Chairmen and Councils, 1865-1910

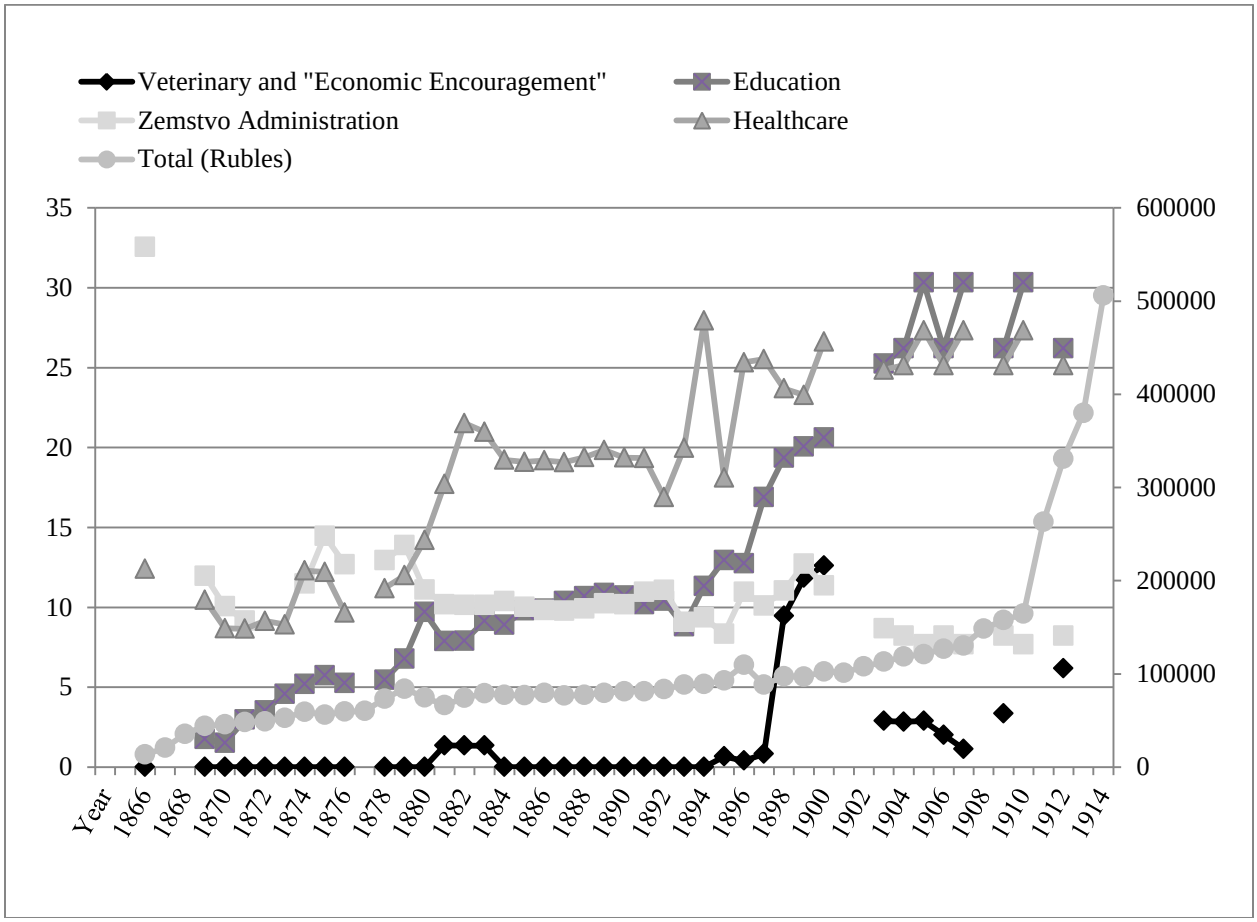
Regime	Chair	Notes Regarding *Uprava* Council
1865-1868	Levashev (nobleman)	
1868-1872	G. Iachmonin (2 terms; former state peasant)	- Neither *uprava* member was an assemblyman; *uprava* disbanded for not funding local courts
1873-1877	A. N. Bologovskii (nobleman)	- *Uprava* members were former serfs, one elected by peasants; another by landowners
1878-1880	A. N. Bologovskii	- Iachmonin was an now an *uprava* member
1881-1891	A. N. Bologovskii (3 more terms)	- *Uprava* members were both peasants
1892-1897	N. M. Lepivtsev (nobleman; was chairman of district council of nobility)	- Same as under Bologovskii
1898-1903	Likely N. M. Lepivtsev	
1904-1906	N. M. Lepivtsev (fell ill at 1906 meeting; assembly voted 500 rubles for treatment)	- Two urban property owners with the same last name (Rekshinskii) were *uprava* members.
1907-1910	N. Ia. Beliaev (son of priest; state councilor; involved in local government since 1868)	- *Uprava* had one peasant and two non-noble property owners

Note: The leadership structure of the Semenov *zemstvo* was determined by reading through all the yearly budgets and by checking various issues of the *Nizhnegorodskie gubernskie vedomosti*, the quasi-official local newspaper. Additional information on a) 1873 from TsANO, 51.251.93; and b) 1907 from TsANO, 51.251.590

Figure 1: The Districts of Nizhnii Novgorod Province

Note: Map generated by the author. Small print terms are districts. Larger bolded terms are the names of the provinces. Moscow province lies immediately to the west of Vladimir.

Figure 2: *Zemstvo* Expenditures, Semenov District, 1865-1914



Note: The "Totals (Rubles)" data series indicates the total budgeted expenditures by the Semenov district *zemstvo*. The other data are shares of total expenditures (in percentage points) dedicated to these four categories. The data are from yearly accounts reported to the Semenov *zemstvo* assembly by the executive committee. These reports were published in different places and have various titles. For example, information on spending in 1876 was taken from Anon. (1876), and the 1900 and 1905 numbers are from Semenovskoe (1901 and 1906). A few observations are taken from Cheshikhin (1914). Overall, these numbers refer to budgeted amounts and not necessarily actual expenditures.

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[1] The data in Table 1 are consistent with other aggregate sources, especially the authoritative Russia, Departament (1903). The notion that the commune was an absolute impediment to agricultural change has recently been challenged in several ways (Kingston-Mann, 1991; and Nafziger, 2010).

[2] The key ministries involved in the agricultural sector were the Ministry of State Domains (1838-1894), the Ministry of Agriculture and State Domains (1894-1905), and the Ministry of Land Organization and Agriculture (1905-1917).

[3] Dower and Markevich (2012) point out that the execution of the land reforms was constrained by the limited supply of administrative capabilities. There was a large increase in state funds directed to agronomy after 1910, with much of this provided to the *zemstvo* to aid their programs (Pallot, 1999). A particular focus of these funds was on helping the newly consolidated farms created under the Stolypin reforms.

[4] Evidence on the widespread adoption of modern machinery and tools is provided in Russia, Ministerstvo zemel (1903). This source emphasizes the significant geographic variation in the rates of adoption among the peasantry.

[5] While public support of agricultural innovation was critical for productivity growth in the U.S. and other developed countries, commercial agricultural firms also engaged in significant research on crop varieties, machinery, and artificial fertilizers in the 19th century. For examples, see Olmstead and Rhode (2008) and Pujol-Andreau (2011). Domestic and foreign firms (such as International Harvester) were active in producing some limited innovations geared to Russian conditions

[6] See the information reported for 1905 in Russia, Statisticheskoe, *Mirskie* (1909). Data available for 1881 and 1894 show a very similar distribution across expenditure categories.

[7] For much more on the *zemstvo*, see Emmons and Vucinich, eds. (1982). The key laws were printed in *Polnoe* (1865 and 1891).

[8] These data are discussed and summarized in detail in Nafziger (2011). The key sources are *Polnoe* (1867 and 1891); Russia, Statisticheskoe (1910); Russia, Tsentral'nyi (1886, 1905, and 1906); Shmigel'skii, ed. (1879); Troinitskii, ed. (1905); and Veselovskii (1909-1911). The note below Table 2 provides more details on the models. Because the expenditure levels on agriculture in 1877 were so small, we define the dependent variable as a dummy variable equal to one if there were any expenditure by the *zemstva* with available budget information. The results do not change if the variable is defined as in the similar model for 1906.

[9] Nafziger (2011) discusses more plausibly causal evidence for a link between peasant representation and greater *zemstvo* expenditures. That study also finds a positive link between the share of assembly seats assigned to the peasant curia and relatively more favorable tax rates on communal land.

[10] See Nafziger (2011). Here, we interpret agricultural support as a broader category than agronomy by including fire prevention measures, rural credit measures, veterinary programs, and other activities (i.e. handicraft promotion). More specifically, the dependent variable of Table 2 represents expenditures on "economic encouragement," which included agronomy spending, as well as fire prevention measures and support for handicrafts.

[11] The central government spent over 28 million rubles on grants and subsidized loans to unified farms established under the reforms, and created provincial agronomy councils to aid the transition of such farms out of the communal structure (Efremenko, 1996). These bodies came to be closely aligned with *zemstvo* agronomy efforts. However, Efremenko notes (11) that *zemstvo* agronomists were more effective than those hired by the councils or the land reform agency.

[12] The scholarly focus on Tsarist 'agronomy' has generally been sociological, with little emphasis on what was precisely done and whether it mattered in the sense of economic welfare sense. For example, Matsuzato (1996) focuses on the family, educational, and social backgrounds of agronomists during World War I and emphasizes how their organizations that were created in the land reforms then evolved during wartime. He provides a useful depiction of what the agronomists did in this period, but he does not focus on the effects of their efforts.

[13] The best summaries of the various aspects of *zemstvo* agronomy are Sazonov, ed. (1896) and Veselovskii (1908, vol. 2).

[14] The choice of Nizhnii Novgorod province arose from two considerations. First, the sources on the *zemstvo* are relatively accessible. Second, the province is actually rather unremarkable in many ways. See Evtuhov (2011) for similar reasoning. The choice of Semenov was motivated by similar factors (see below).

[15] This was slightly below the average for European Russia of approximately 12.8 per cent urban. However, these numbers reflect official designations rather than actually settlement size.

[16] However, aggregate numbers do show that Nizhnii was less agricultural than the rest of European Russia. Not only was non-agricultural income higher than in European Russia (14 versus 13 rubles per capita), but the portion of the population involved in some form of 'industries' (*promysly*) was considerably greater – 50 versus 34 per cent – by the end of the 19th century (Russia, Departament, 1903: 312-315).

[17] These numbers were produced by detailed property tax assessments carried out by the provincial *zemstvo* in the late 1880s. For details, see Evtuhov (2011). The data are summarized in Russia, Departament (1903).

[18] This drop-off in the acreage planted in grains seems to have been driven by the harvest failures of 1891-2, after which production never recovered.
[19] As the peasant curia was rarely in the majority at the district level, when district assemblies elected representatives to the provincial assembly they generally chose non-peasants, particularly because the unpaid assemblymen positions entailed high opportunity costs.
[20] Vasil'sk and Lukoianov districts shared one agronomist by 1908.
[21] These numbers are taken from Russia, Statisticheskoe (1910). The similarity in the level of Nizhnii and other *zemstvo* expenditures is evident before and after 1906. Provincial *zemstvo* assessed district *zemstva* based on their populations and property values.
[22] According to the regular budgets, the money spent on agricultural goals was not substantial; however, districts would occasionally utilize separate accounts (or endowments) to finance large-scale initiatives. For example, Lukoianov district successfully established a storehouse to rent out machinery with funds from a special capital reserve in the early 1900s (Lukoianovskaia, 1907).
[23] These data were extracted from yearly accounts, which were only are only available in a relatively complete series for Semenov and Gorbatov districts. The latter showed very similar patterns, and so we do not report it here.
[24] In the first meeting of the Semenov assembly in March of 1866, a local landowner proposed to set aside over 40 acres for an experimental farm, but the assembly thought this idea was premature, especially given budget constraints (TsANO, 42.240.13a.126).
[25] Total district expenditures per capita in 1877 are uncorrelated with the share of seats assigned to the peasant curia under the 1864 law, but 1906 expenditures are negatively and significantly related to the shares under the 1890 law in the province.
[26] These data are reported in Syrnev, ed. (1888).
[27] As we saw, the raw correlation went in the opposite direction in Nizhnii. Nafziger (2011) discusses how the shares of seats assigned to the curiae were set under the two laws.