Land Inequality, Industrialization and Unrest: Evidence from the Late Russian Empire

By

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To Tanya and Misha

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Abstract

Why is economic development, despite being beneficial for society as a whole, often associated with political instability? Can the redistributional effects of industrialization lead to more intense conflict? These issues have been important for most agrarian countries undergoing rapid economic transformation, and are still relevant. Nevertheless, there are few attempts to address them using the toolbox of contemporary social science.

This dissertation seeks to address these problems in the historical context of the late Russian Empire—a country experiencing rapid economic progress simultaneously with mounting popular discontent, which paved the way for its ruinous demise. Focusing on the dynamics of peasant unrest, I argue that industrialization could have an ambiguous effect on the intensity of conflict due to two opposing forces: expanding non-agricultural employment opportunities (labor absorption), which mitigated peasant demand for land, and greater competition for local natural resources, acting in the opposite direction. The net effect of industrialization depended on which of these two mechanisms prevailed, which itself was determined by the structure of industrial development. Moreover, this process could also affect the magnitude of the positive impact of land inequality on conflict, making peasants more or less sensitive to disparities between private and communal landholding.

My theory builds on the existing literature on the political economy of development and ample historical evidence from the Russian Empire. First, I analyze the case of a large-scale peasant uprising in 1902 in the Poltava and Kharkov provinces, located in the

south-west of the Russian Empire. The hotbed of the uprising was the territory occupied by a huge commercialized and industrialized estate increasingly reliant on large-scale tenants, who either cultivated the land formerly available to the peasants or sublet it at higher rates. The villages suffering particularly severe land shortages played the most important role at the onset of the uprising. The district where it started had the lowest share of land communally owned by the peasants. Notably, mass looting and property destruction also targeted sugar refineries. The logic of conflict between peasants and landlords is illustrated with the help of a formal model, which supports my theoretical intuition: commercialization and greater productivity of large-scale landownership and the lack of outside options for the peasantry engaged in subsistence farming may make conflict more likely.

I test my theory with a quantitative analysis of district-level panel data for the European part of the Russian Empire from 1879 to 1904. As expected, the association of land inequality and unrest is positive: a lower share of allotment land (in communal ownership of the peasants), as opposed to state and private land, is associated with higher peasant unrest. The relationship between overall industrialization and peasant unrest is often negative, but typically insignificant, whereas its interaction with land inequality is positive, which means that it could decrease the negative association between allotment land and conflict, reducing peasants' sensitivity to the availability of land due to the prevalence of the labor absorption effect.

The results are also largely consistent with my theoretical expectations if we consider different industries separately. Food processing, for which it is possible to expect the prevalence of resource competition over the labor absorption channel, was associated with higher unrest, and strengthened the relationship between land distribution and conflict. The opposite is true for the textiles industry, which employed local labor, but used externally sourced raw materials. My sub-district analysis of the 1905–1906

peasant unrest in the Kursk province, located in the fertile black soil region in Southern Russia, mostly supports these conclusions, especially with respect to the role of the food industry and, more specifically, sugar refining.

Exploring a relatively understudied topic, this dissertation makes a valuable theoretical and empirical contribution to studies of conflict and the political economy of development. Combining different methods and types of evidence, complementing in-depth case studies with broad-based quantitative analysis, it produces a comprehensive picture of the determinants of peasant unrest generalizable to other world regions and time periods. It also considerably enriches our knowledge of the history of the late Russian Empire and the prerequisites for the social and political upheaval that caused its collapse. My data collection effort, which produced two novel quantitative datasets containing district-level information on peasant unrest, industrial development, land inequality, and other socio-economic indicators in the Russian Empire in the last decades of its existence and, at a less aggregated level, in one of its provinces, will hopefully be valuable to other historians and social scientists in future work.

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Introduction

It is well known that major economic shocks and transformations can lead to large-scale social and political upheavals. It is not surprising that when the shocks are unambiguously adverse, we can observe a rise in public discontent, sometimes having far-reaching consequences. It is less intuitive that rapid economic change (generally concomitant with economic growth or at least considerable efficiency gains) which should be beneficial for the society as a whole, can have the same consequences. Yet, examples are plentiful and go back centuries: from the 1789 French Revolution, the roots of which were famously analyzed in Tocqueville 1856,[1] to revolutions, mass movements, civil wars and guerrilla resistance, which occurred in developing agrarian countries in the 19th and 20th centuries, for example, in Mexico, China, Vietnam, Algeria and numerous other African, Latin American and Asian countries (Wolf 1969, Foran 2005).

One of the possible explanations of this pattern takes into account the distributional consequences of economic development, which has been a subject of important scholarly debates. In the contemporary political economy literature there is a general understanding that apart from unambiguous material gains, modernizing economic transformations, such as industrialization, create both economic losers and winners, and therefore can cause political instability and change (e.g. Acemoglu and Robinson 2006; for influential earlier theorizing see Moore 1966 and Huntington 1968). It might be argued

[1] A prominent example of the further development of Tocquille's ideas can be found in Davies 1962, who, among other cases, considered the 1917 Russian and 1952 Egyptian revolutions and wrote about the "J-curve" pattern: "revolutions are most likely to occur when a prolonged period of objective economic and social development is followed by a short period of sharp reversal" (p.5), subverting people's expectations. This is also related to Gurr's "relative deprivation" thesis (Gurr 1970). See discussion in Foran 2005, pp. 8 - 10.

that purely economic losers do not usually pose a significant threat to political and economic development (Acemoglu, Johnson and Robinson 2005), however, as follows from my findings, the path of the Russian Empire towards revolution may serve as an important counterexample.

Relationships between inequality and conflict, in particular, the effect of land distribution on rural unrest, which is the focus of this dissertation, have been widely studied (Finkel, Gehlbach and Olsen 2015, Albertus, Brambor and Ceneviva 2018, Albertus 2020, Sánchez, del Pilar López-Uribe and Fazio 2010, Domenech and Herreros 2017). However, in the contemporary political science and economic literature analyzing conflict, there have been almost no attempts to connect such phenomena as industrialization, inequality, erosion of traditional economic and social institutions, and popular, especially peasant discontent, despite the abundant historical evidence. The aim of my dissertation is to partly fill this gap.

The late Russian Empire, which experienced rapid economic development along with waves of popular upheaval leading to its eventual demise, is an example worthy of further study. The dissatisfaction of Russian peasants with the extant land distribution has traditionally been named a major source of the conflict that revolutionized the countryside in 1905–1907, served to undermine prospects of stable democratic representation, and facilitated the downfall of the Tsarist regime in 1917, which was followed by a mass takeover and redistribution of privately-owned land by peasant communes (Asher 1988, Wade 2017). *Ultimately, economic development failed to ease public discontent, which could happen, as I show in my dissertation, in part because it was insufficient and excessively concentrated in some areas, but also because the growth of some industries could be instrumental in breeding peasant discontent due to uneven distribution of gains and losses.*

This dissertation considers the relationships between the proliferation of modern industry, land inequality, and popular unrest, in particular, peasant unrest in the late Impe-

rial Russia. Industrialization in the Russian context is mostly associated with the forced transformation of the economy in the Soviet period, but the earlier, pre-revolutionary industrial development, which had already started to noticeably reshape the socio-economic landscape of the country, and its political economy implications deserve a more in-depth examination. I hope that in addition to its contribution to the political economy of development, this dissertation will enrich our knowledge of the life of the Russian peasantry and its encounters with other classes, the economic, political and social development of the Russian Empire, and the causes of the 1905 and 1917 revolutions, as well as implications for other countries which experienced or are currently facing similar challenges.

Working on the dissertation, I have collected two unique statistical datasets. One of them allows us to trace the patterns and dynamics of rural conflict and industrial development, as well as railroad construction, population growth and land ownership in the Russian Empire at the district (sub-province) level for about three decades preceding World War I; another explores the peasant unrest in 1905–1906 and its socio-economic determinants in a selected province at a sub-district administrative level.

More specifically, I believe that my dissertation makes two important scientific contributions. First, it addresses a relatively understudied topic in the political economy of economic development and conflict, which has only recently started to attract the attention of economists and political scientists applying contemporary quantitative and formal methods. I suggest an explanation of the puzzling phenomenon of growing instability accompanying development (Huntington 1968), with the focus on industrializing agrarian societies. To this end I develop a novel theory of the relationships between industrialization and rural discontent at the local level, which is partly based on insights and observations having been present in the historical and political scholarship for a long time, but yet unexplored in the modern literature. I highlight, explain, and provide empirical evidence regarding the two main mechanisms through which indus-

trialization affects peasant discontent and how they interact with land inequality. My dissertation demonstrates that depending on the nature of industrial development, its utilization of labor and material resources, we can observe different patterns of its influence on peasant discontent, which can be both positive and negative.

Treating economic development as the independent variable in models explaining conflict is still very rare in the contemporary literature, which prefers to dwell on clearly exogenous causes, such as, for instance, climate and weather shocks, or relatively static institutions or inequality patterns. I show that a transformative modernization processes may be another important factor of conflict dynamics that we should not lose sight of, despite greater difficulties with causal effect identification.

Another contribution is the empirical analysis of a prominent case of a developing country experiencing mounting popular discontent. Although the historical literature analyzing the development of late Imperial Russia, peasant life, and causes of the 1917 Revolution is too enormous to be even briefly reviewed here, there is still a lack of subnational empirical studies seeking to explain the determinants of internal conflict with the help of quantitative methods used in contemporary social sciences. This study sheds light on local industrialization dynamics and other determinants of peasant unrest in the Russian Empire in the period preceding a series of revolutionary upheavals, and, for a selected region, during the 1905–1906 revolutionary events. It reveals that peasant unrest indeed was influenced by industrialization and land inequality, and applies a nuanced approach to the analysis of their impact. My analysis rests on two novel quantitative datasets (one at the sub-province, and another at the sub-district, level) and a detailed qualitative study of a prominent peasant revolt. These provide a granular view of socio-economic development and rural conflict in the Empire and will be useful to scholars of Russian history and historical political economy.

The structure of my dissertation is the following: Chapter 1 outlines my theoretical

argument concerning the causal nexus between the rate and character of industrialization, land distribution and conflict. I show that existing literature suggests an ambiguous influence of industrialization on peasant discontent and rural conflict: it can provide peasants with alternative employment opportunities and relieve their dependence on land tilling or make it more profitable, but at the same time it can lead to higher competition over limited resources, such as land, forest, pastures and meadows, indispensable as sources of inputs both for peasant farming and industrial establishments. Intensified competition over land could amplify grievances arising from already existing land inequality. The effect of industrialization depended on the industry in question: for those more reliant on locally sourced raw materials, the incendiary effect of competition could outweigh the mitigating "labor absorption" (or "exit") effect, and thus provoke more unrest.

Chapter 2 of the dissertation provides a historical summary of the evolution of state policies with respect to the peasantry, the distributional patterns and legal forms of land ownership, and the dynamics and composition of peasant unrest. The authorities' traditional priorities were to keep domestic peace and order, even at the expense of economic efficiency. Therefore they preserved communal institutions, heavily restricted the sale and purchase of communal land, making it effectively almost inalienable, and controlled migration in order to prevent the loss of land and "proletarianization" of the peasantry. Although more land in peasant communal ownership could pacify the peasants, which was especially important given their limited mobility due to the lack of outside options, the costs of transportation and official restrictions, the conflict of the commoners[2] with the private and state landownership remained unresolved. After the 1861 emancipation there was a temporary standstill in the Russian countryside, which gave way to increasing unrest from the late 1890s. This growing instability came simultaneously with an

[2]Members of land communes, *obshchinniki*.

industrial takeoff, and, as can be seen from the data, could bear some relationship to it.

In Chapter 3, in order to elaborate my theory and acquire a richer knowledge of the mechanisms underlying the relationships between industrialization, land inequality and unrest, I build an analytical narrative around a case study of a large-scale peasant uprising in the Poltava and Kharkov provinces in 1902, based on published archival documents, and I develop a formal model which illustrates my main theoretical points. Industrialization can provide peasants with more income outside agriculture, reducing their need for land and conflict potential. Yet, another side of industrial and commercial development—growing agricultural productivity due to application of better techniques and tools, as well as the shift to cash crops, often consumed by local industrial facilities (most typical for large estates)—could lead to higher market demand for land and renting costs, thus making it harder for the peasants to rent private land for subsistence farming. According to the evidence on the Poltava–Kharkov uprising, which started on the territory close to a gigantic industrialized and commercialized estate in the Poltava province and ended with the plundering of a sugar refinery in another province, the local peasantry had experienced increasingly strong grievances caused by the shrinking supply of land available for rent and worsening rent terms.

Chapter 4 provides a quantitative examination of my theory. Using a novel dataset covering the European part of the Russian Empire at the district level in 1879–1904, I show that aggregate industrial growth per se did not seem to be accompanied by increased rural conflict, but the correlation might have been positive or negative depending on the industry or region in question.

Land inequality between the peasant communes and private landowners, measured by the share of allotment land (*nadel'naya zemlya*), that is, communally held peasant land received after the emancipation of serfs in 1861, was an important determinant of conflict individually and in conjunction with industrialization. The lack of land owned by

peasant communes was relatively strongly associated with a higher intensity of peasant unrest. I find some statistical evidence of the presence of the interaction of industrialization and land inequality (operationalized as the share of allotment land): it might have been positive, that is, in more industrialized areas a negative association of unrest with land inequality could be muted, probably signifying weaker dependence of the peasants on the supply of land in presence of outside options. Yet, this relationship does not always hold, and can take different directions if we consider various industries separately.

The development of industries for which the effect of competition for local resources, such as arable land or forest (the "resource competition" channel), turned out to be more important than the provision of alternative employment opportunities to the peasantry (the "labor absorption" channel), could have a relatively strong positive association with peasant unrest. This was the case with food industries reliant on locally sourced agricultural raw materials, which is contrasted with the textile industry.

The major branch of the textile industry was manufacturing cotton cloth and apparel, and the cotton factories were mainly located in the Moscow and Vladimir provinces of the Central Industrial region (also in Polish provinces, but these are beyond the scope of my study). They mainly used the local labor force, but relied on cotton imported from abroad or from the Central Asian part of the Empire. It was similar for the wool industry, whereas in case of linen the raw materials were locally sourced, but largely grown by peasants, who directly benefited from it. The regression results show that unrest was negatively and significantly associated with the number of workers employed in textiles even in the presence of district fixed effects, whereas its interaction with the share of allotment land was positive (but significant only when fixed effects are added). That is, the greater development of this industry was associated with a weaker relationship between unrest and allotment land.

Consider the food industry facilities, which were largely located in the countryside, close to the sources of raw materials: The sugar refineries were particularly large establishments, employing hundreds of workers and processing locally grown sugar beets. These factories, receiving sugar beets from the factory-owned land, private "plantations"[3] (and sometimes peasants), directly competed for the exploitation of land resources with subsistence farming, still widespread among the local peasants, whereas hired laborers working on "plantations" and factories could migrate from other places. This competition could provoke discontent among the local peasantry. Indeed, the presence of the food industry is positively (but insignificantly, when unit fixed effects are included) associated with unrest, and its interaction with the share of allotment land is negative (although always insignificant). If anything, there is a weak tendency toward a stronger association between unrest and land inequality in the districts with a more developed food industry.

The empirical analysis in Chapter 5 provides a further testing of my hypothesis, but at a lower administrative level and a more limited geographical scope. It considers the 1905–1906 peasant unrest in the Kursk province, located in the Central Blacksoil region, at the parish (sub-district) level. This case study, based on a more detailed analysis, allows me to control for a wider range of possible confounding factors and make a stronger causal cause. The results of this study lend additional support to my theoretical intuition and provide particularly strong evidence in favor of the positive influence of industrialization on peasant unrest, which might be explained by the strong development of food processing, in particular, sugar refineries in this region. The prevalence of food processing in parishes and proximity to sugar refineries were all strongly and positively associated with the occurrence of unrest in 1905–1906. Similar to the district-

[3] In the literature of this period the term "plantations" (*plantatsii*) was frequently applied to large sugar beet fields belonging to large landowners. They were run on commercial grounds, and in the post-emancipation period used only hired labor.

level study, the interaction between unrest and the food industry is negative (although insignificant);[4] however, the interaction with proximity to a sugar refinery is almost always positive, but insignificant.

[4]It is also negative if we consider total industrial employment, but that must be caused by the prevalence of the food industry.

Chapter 1.

Theoretical Framework and Hypotheses

1.1 Introduction

This chapter contains the formulation of my theoretical argument. First, it reviews the relevant literature examining the relationship between economic development, industrialization, technological progress and popular conflict, and then proceeds to the formulation of the theoretical mechanisms and hypotheses, guided by the existing historical and political economy literature. I highlight two main channels through which industrial development may affect conflict: By providing alternative employment to peasants, it can alleviate their discontent, but increased exploitation of local resources (land, forest, pastures, etc.) can lead to the opposite effect. The ambiguity of the effect of industrialization on rural conflict follows from the heterogeneity in the patterns of industrial development: the presence of industries more dependent on local resources (e.g. requiring locally sourced agricultural raw materials) and directly competing with peasants for them tends to intensify unrest and make land inequality more consequential for conflict, whereas externally sourced industries may have the opposite effect.

1.2 Economic Development and Conflict

The study of the political economy of economic and social development, and, specifically, industrialization has a long history. The "turbulence" created by market develop-

ment, industrialization and other modernization processes generating both winners and losers has been discussed by many authors (e.g. (Tocqueville 1856, Polanyi 1944, Huntington 1968; more recently, Acemoglu and Robinson 2006 and Acemoglu and Robinson 2000). Greif and Iyigun 2013*a* stress the point that violence and disruption of social order can be among the consequences of growth-enhancing innovations increasing labor productivity and temporarily reducing demand for labor and causing impoverishment. This problem, along with inability to compensate individual risks to innovators, can actually prevent innovation.[1]

To scholars of economic reforms a similar phenomenon has been known as the J-curve: reaching long-term gains is preceded by suffering through the costs of transition, which can be destabilizing and undermining of democratic development (Hellman 1998, Przeworski 1991, Haggard and Kaufman 1995). Finkel and Gehlbach 2020, referring to the case of 1861 serf emancipation in the Russian Empire, designed a formal model illustrating that reforms may provoke rebellion if there emerges a gap between popular expectations and actual implementation.

There is a well-developed literature on the effects of economic shocks on internal conflict (e.g. Bazzi and Blattman 2014, Miguel, Satyanath and Sergenti 2004, Ciccone 2011, Besley and Persson 2009, Jia 2014). However, this strand of research mostly deals with exogenous transient weather or terms of trade shocks, negatively affecting income, whereas my interest is focused on structural economic transformations, and stands closer to the emerging quantitative literature examining the effect of market development and technological progress on conflict.[2]

[1]The authors demonstrate empirically (Greif and Iyigun 2013*b*) that a reliable state-sponsored social safety system in England could mitigate popular unrest ("food riots") up to the early 19th century. Thus, England was able to enjoy rapid technological progress and industrial growth along with relative social and political stability. However, their research is focused on the prevention of unrest with poor relief rather than the former's fundamentals.

[2]There is also a growing literature finding a positive influence of industrialization on democratization (Fresh 2018, Cirone 2018, Lacroix 2017)

In particular, Caprettini and Voth 2019 find that introduction of labor-saving threshing machines in agriculture indeed led to a higher probability of the 1830–1832 "Captain Swing" riots of landless agricultural workers in England. This result supports historical narratives explaining these disturbances by mechanization of agriculture and worsening labor conditions.[3] On the other hand, Molinder, Enflo and Karlsson 2019 show that adoption of electricity, a labor-saving technology, in early 20th century Sweden was accompanied by an increase in the number of strikes, but they arose not as a result of worker displacement, but rather because of greater bargaining power of workers employed in growing sectors. Geloso and Kufenko 2019 consider the case of the 1837–38 rebellion against British rule in Lower Canada, and show that richer localities with more developed markets (measured by the wheat price gap with urban centers) were more likely to rebel due to the lower costs of coordination.

In sum, both grievances and improved coordination abilities stemming from technological progress can affect the incidence of conflict. Technological progress in production, making redundant some current workers, can intensify conflict, however, advances in communication and transportation, facilitating coordination of conflict participants, and strengthening of the workers' bargaining position in some sectors could be no less important in that respect. Although the organizational capacity of unrest participants or, conversely, the state repressive capacity are important, the main focus of my dissertation is on the redistributive consequences of economic development, which can lead to more intensive grievances on the part of those negatively affected. Similar to workers losing their employment due to labor-saving innovations, the peasants, largely engaged in subsistence farming, could experience impeded access to land due to its conversion

[3] Aidt and Franck 2015 consider the effect of Swing Riots on electoral support for the Liberals promoting franchise extension. However, their focus is on the consequences, rather than the causes of the riots. A companion paper, Aidt, Leon and Satchell 2017, closely considers the role of communication in the spread of the Swing Riots, but pays less attention to their socio-economic fundamentals; they find that less urbanized counties with a larger middle class were more prone to riots.

to more productive and profitable activities by private owners.

The novelty of my analysis is to consider various consequences of development which could push grievances and unrest in opposite directions. I account for communication factors and repressive capacity, but even controlling for these factors, grievance-related mechanisms seemed to play a role. Rigorous empirical testing of the theories linking development and conflict is still relatively rare, and I hope that this dissertation will be a valuable contribution in the long-standing debate.

1.3 Industrialization and Peasant Unrest

The problem of the influence of rapid and large-scale economic transformations on the peasantry has been salient in virtually all agrarian societies since the modern era, and is still important in many developing countries. In Europe the potentially destabilizing consequences of market development could be felt even before the Industrial Revolution (DuPlessis 1997), all the more since its inception (Neal and Williamson 2014).

Several mechanisms linking industrialization and popular unrest are present in the literature. Their consideration reveals that the potential effect of industrial development is not unidirectional. The first set of mechanisms corresponds to the situation when industrialization provokes unrest.

One of them (e.g. Neal and Williamson 2014) is the inability of traditional, artisan industry to compete with modern ones, which can cause mass impoverishment of craftsmen and peasants engaged in traditional crafts. Another "macro"-mechanism, more typical of late industrializers, like the Russian Empire, could be the fiscal mobilization of resources required by state-led development (Gerschenkron 1965).

Other mechanisms, more relevant for this study, could reflect the situation at the local level. In the areas where a significant part of land and other formerly communal hold-

ings, such as forests, pastures and meadows, belonged to landlords, the latter's thrust to commercialize and industrialize could exacerbate competition over scarce resources and result in partial "proletarianization" of peasants,[4] producing numerous conflicts (Edelman 1987). Growth of manufacturing raises demand for raw materials, for example, cash crops for the food processing industry (Edelman 1987). As a consequence, more land is allocated to cash crops by landlords and corporative owners, who increasingly purchase and rent land, making it less available to peasants largely engaged in subsistence farming. Second, industrial demand for fuel could also come into conflict with the needs of the local peasants. As an example, conflicts over access to forests gained particular prominence during World War I, when forest owners (usually non-peasants) expanded wood cutting due to the limited supply of other fuels (Malyavskii 1981).

Industrialization, as a part of market economic development, itself requires land and labor "commodification" (Hobsbawm 1962, Polanyi 1944). Hobsbawm 1962 describes three main transformations of the agrarian sector which were necessary for market development and economic growth: "land had to be turned into a commodity" privately owned and freely exchanged on the market; its owners had to be profit-oriented; "the great mass of the rural population had... to be transformed... into freely mobile wage-workers for the growing non-agricultural sector of the economy" (p. 181). This "legal revolution" of land tenure often led to a decrease in peasant landholdings and impeded access to formerly common resources. Development of land markets could cause greater inequality and landlessness among peasants.[5] Similarly, the combination of industrial

[4]That is, their transformation to propertyless hired laborers, severing their ties with land and communal organization, and abandoning traditional modes of life.

[5]The "contradictions" of the capitalist transformation of agrarian economies have been widely explored in the works of left-wing or Marxist scholars, for example, in discussions related to the economic development of preindustrial England (Tawney 1912, Brenner 1976, Aston, Aston and Philpin 1987). Tawney's exposition of the "agrarian problem" in England highlighted such phenomena as the conversion of customary tenure into market-based leasehold, enclosures and evictions of tenants, especially in the mid-16th century, which allegedly were part of capitalist transformation (Tawney 1912). The idea that successful agricultural commercialization and capitalist development necessitated eviction of small

employment with land ownership could increase intra-commune conflicts (richer vs. poorer peasants or permanent dwellers vs. absentees).

Relatedly, the "moral economy" thesis suggests that increased peasant unrest could be provoked by the decay of traditional safety nets, which linked peasants within their communes and landlords, providing them with minimal subsistence (Scott 1977, Scott 1985, Shanin 1972). Contrary to this view, other authors underscored peasants' ability to embrace market opportunities and rationalized legal procedures and institutions (Popkin 1979; for the case of pre-emancipation Russia, see Dennison 2011).

On the other hand, there are compelling reasons to think that industrialization can mitigate peasant unrest. Industrialization has been an important, often crucial component of economic growth in the modern era and led to increasing social welfare at least in the long term.

The peasants could directly benefit from industrialization by getting access to employment opportunities outside of subsistence farming and fitting in commercial and manufacturing activities. Those living in the vicinity of industrial and urban centers could profit from rising land prices and opportunities to develop commercial agriculture providing industrial workers and other urban dwellers with food. Income from farming could be complemented by earnings from seasonal factory work. Peasants could also permanently migrate to cities to become factory workers enjoying higher income and independence from communal institutions (Burds 1998).

Figure 1.1 conveys a summary of my argument with respect to the role of industrialization. The focus is on the two main causal channels of interest: the "labor absorption" channel, which diverts labor from agricultural activities and can relieve "land hunger" and related discontent, and the "resource competition" channel, that is, increased de-

landholders by means of higher rental rates became one of the subjects of the so-called "Brenner debate" (Aston, Aston and Philpin 1987, Brenner 1976)

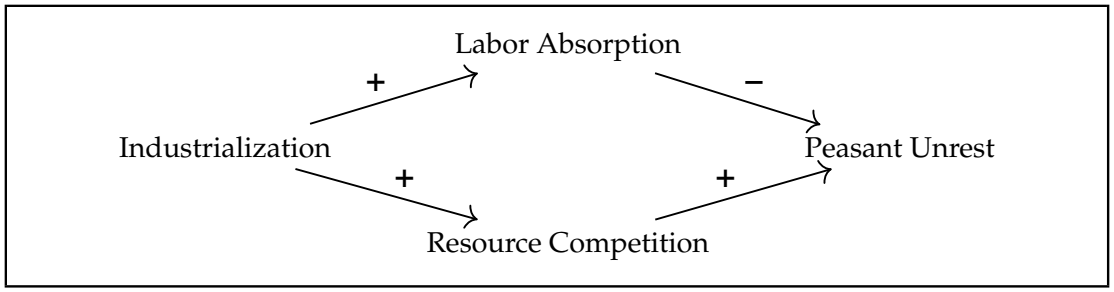

Figure 1.1: Channels of influence of industrialization on peasant unrest. "-" means a negative effect (leading to decrease), and "+" means a positive effect (leading to increase).

mand for the limited supply of resources, potentially provoking conflict. Thus, a potential effect of industrialization on peasant discontent is inherently ambivalent, depending on the relative strength of the counteracting mechanisms. If the labor absorption mechanism prevails, then the net effect is negative; on the contrary, if the resource competition channel takes precedence, then the net effect is negative. Therefore we can *hypothesize that industrialization can have either positive or negative effects on peasant unrest*.

Following this logic, it is possible to generate different theoretical predictions depending on the industry branch in question. It can be expected that *for locally sourced industries that are more deeply rooted in local factor markets and often directly compete for land and other resources with nearby peasants,*[6] *the effect of surplus labor absorption could be offset by the resource competition channel, and the resultant effect will be either negative, but smaller in absolute terms, or positive*.

[6]Such as the food industry, for example, sugar refineries requiring allocation of land to sugar beet cultivation.

1.4 Industrialization and the Effect of Land inequality on Peasant Unrest

Land inequality has traditionally been considered a potential source of rural conflict. It has been shown in different contexts that land reforms distributing more land among smallholders can alleviate discontent (Albertus 2020, Domenech and Herreros 2017), although the relationship between land inequality and unrest might not be so straightforward, depending on characteristics of unrest and local power distribution (Albertus, Brambor and Ceneviva 2018, Albertus and Kaplan 2013).

According to Barrington Moore (Moore 1966), the persistence of landlord-dominated "labor-repressive" agriculture, which was characterized by reliance of large landowners, amassing most of the land, on a stock of cheap peasant labor, maintained by constrained mobility and unavailability of land, could provoke greater peasant discontent, which required authoritarian political institutions to keep it in check (for more recent treatments see Mahoney 2003 and Albertus 2017). In general, we may expect a positive relationship between land inequality and peasant unrest. More specifically, I will focus on one particular indicator of land distribution, which is most relevant given the empirical context of my study: *the higher is the share of land in communal peasant ownership (allotment land), the lower is the intensity of peasant unrest*.

In addition, there could be present an interaction between industrialization and land inequality. For instance, as Moore suggested, peasant discontent could be caused not only by "labor-repressive agriculture" per se, but by its relationships with increasing commercialization of agriculture:

> Where the peasants have revolted, there are indications that new and capitalist methods of pumping the economic surplus out of the peasantry had been

> added while the traditional ones lingered on or were even intensified (Moore 1966 (1993), p. 473).

It could take place when labor-coercive practices were increasingly combined with market-oriented production, which was possible only in large enough landholdings (one may think, for example, of Prussian or Polish landlords).

However, a somewhat different mechanism could be at play, as suggested by the evidence from the Russian Empire analyzed in Edelman 1987, Miller 2013, and my Poltava-Kharkov uprising case study to be discussed below. Commercializing landlords in the areas with labor-dependent agriculture could turn to more efficient and capital-intensive farming expanding the cultivated area under cash crops not consumed by the peasants. Thus, they were actually abandoning dependent labor practices and needed less peasant labor and more land than was previously rented by peasants. The latter faced growing land rent prices, decreasing supply of suitable land and declining demand for their labor services. Given that the majority of the peasants were still engaged in non-market, subsistence farming, and their mobility was constrained (not only because of official regulations, but also high transportation costs and limited outside employment opportunities), these developments could threaten their survival, and lead to increasing discontent (see Anfimov 1961 on tensions between market- and subsistence-oriented land rent).

Market-based industrialization, which is the focus of this paper, could be one of the major components of agricultural commercialization. It could lead to proliferation of market-based labor hiring practices. Large landlords could build industrial enterprises, usually, but not exclusively, processing agricultural products in their estates. Increasing demand for grains and technical crops, such as raw materials and agricultural mechanization, could be concomitant with intensifying land commodification and the spread of large-scale market-based tenancy, crowding out peasant subsistence farming.

Consequently, the effect of land inequality could be conditional on the level and the nature of industrialization because of the two major countervailing tendencies. As a provider of additional employment and earnings, industrial development could make the peasants less dependent on agricultural activities and therefore less sensitive to land availability. In that case industrial development could potentially diminish the mitigating effect of lower land inequality. On the other hand, as the literature demonstrates, the land shortage might have become particularly acute if industrialization made private land or other private and state resources less accessible to peasants. The sign and the magnitude of the resultant of these two forces could depend on the structure of industrial development. In particular, as will be demonstrated below, for such industries as rural-based food processing, especially sugar refining, which could strongly compete for productive resources with the peasants communes, the second channel may prevail, whereas for other types of industries, such as machinery or textiles the reverse could be true.

My argument is based on the presumption that greater land concentration in the hands of large owners produces more discontent on the part of communal smallholder peasants, which pushes them to act. Given that participation in unrest is costly, peasants should weigh alternatives, and industrialization is one of the factors determining their opportunity costs. Greater availability of industrial employment makes them less willing to risk the illegal occupation of privately owned land or seizure of other agricultural resources. Conversely, greater competition for land and contraction of the land which is available for rent and can complement peasant communal land, which is essential for subsistence farming, will make the existing land ownership inequality less bearable. Thus, all else equal, a given level of land inequality may correspond to different levels of peasant unrest depending on the structure of industrialization, that is, the relative strength of labor absorption and resource competition channels, and its pace.

Industrial development can potentially mitigate of amplify the importance of access to land to peasants, and thus positively or negatively affect its salience.

In Chapter 3 these hypotheses will be illustrated by a formal model, which shows that the relationship between the share of land owned by the peasants and unrest is mostly negative (except for very low shares of peasant land), and higher industrial wages reduce its negative value in absolute terms or even make it positive. At the same time, higher productivity of landlord farming, which in practice could be associated with rural-based industrialization and transition from peasant staples to cash crops, had a non-decreasing influence on the peasants' sensitivity to land inequality (Figure 3.9).

Combining the arguments of this section with my previous discussion on the role of industrialization, it can be hypothesized that *industrialization in general could either exacerbate or moderate the effect of land inequality on rural conflict, but we are more likely to observe the former in industries more strongly reliant on local raw materials, and the latter in those less linked with local agriculture*.

It must be emphasized that my dissertation closely examines *both* industrialization and land inequality, as well as their interaction, and they serve as the main independent variables in the regression analysis. The issue of land distribution has traditionally been seen as a major determinant of rural conflict in agrarian societies, and the Russian Empire is no exception. Therefore, in addition to the direct consideration of the role of industrialization, which is a major innovation of my study, it makes sense to explore whether it could influence the significance of land inequality. The same variation in the share of communal land ownership could have a different impact on peasant unrest depending on the level of industrial development and its composition. Thus, industrialization might have affected peasant unrest through different causal channels, with some of them related to the changing impact of other variables, such as land distribution. For instance, through the resource competition channel, growing industries required more

resources, which became unavailable to peasants and also strengthened their dependence on communal land and emboldened them to infringe on another's property.

An alternative strategy would have been to treat land inequality as a moderator variable shaping the effect of industrialization. In terms of the linear regression method used in this dissertation, this would constitute the equivalent model including the two variables and their interaction term, but their interpretation would be different. However, due to the salience of land inequality, I deem it more relevant to focus on how its effect depends on the structure and level of industrialization.

1.5 Stylized Facts from the Russian Empire

Forestalling the further discussion, as far as the Russian Empire is concerned, there exists empirical evidence of the effects of capitalist development and industrialization, coupled with the land inequality, on peasant unrest, mostly based on the analysis of the 1905–1907 revolution. Perrie 1972 argues that in 1905–1907 peasant unrest "was strongest in those areas, such as the Central Black Earth, the Volga and the Ukraine, where the exploitation of the peasant renters by the gentry landowners was greatest, or where the severest hardships had been caused by the transition from renting to large-scale capitalist farming" (p. 127). Edelman 1987 shows how this "capitalist farming" associated with the proliferation of sugar factories in the South-West Ukraine could boost peasant discontent. Similarly, Miller 2013 in his analysis of 1905–1906 peasant unrest in the Kursk province finds that disturbance incidents were especially frequent "in zones of influence of larger 'modernizing latifundia' " (p. 45), which were specialized in sugar beet cultivation and processing. In general, more modernized and populated localities seemed to be more active. These conclusions are mostly supported by my quantitative analysis exploring Miller's data and presented in Chapter 5.

According to the mail survey conducted in European Russia by the Free Economic Society in the wake of 1905–1906 events, in the Rylsk district of the Kursk province, one of the reported causes of unrest was a shrinking supply of land available for rent because of a growing area used for sugar production (Vol'noye ekonomicheskoye obshchestvo 1908, p. 50). This source, as well as Druzhinin's "peasant movement" chronicles, contains many examples of clashes between peasants and landlords or the state over limited resources. Burds 1998 provides an account of a contemporary observer, who describes related developments in the Melenki district of the Vladimir province, located in the Central Industrial region,[7] which illustrates the situation when the migration mechanism of the effect of industrialization on unrest might have offset the influence of the resource competition channel:

> As a consequence of insufficient land, soil exhaustion, and the impossibility of expanding purchased landholding due to the pressure of nearby factories, the villages have been ruined. Two-thirds to three-fourths of the youths leave for the factories, where they live fairly well, while the majority of those who remain in the village are old folks who grew up under serfdom (p. 30).

Indeed, according to available estimates, in 1905–1907 the Central Industrial Region, containing old centers of industrialization, which continued to experience rapid growth, was not among the leaders of peasant unrest intensity, occupying instead a mid-range position (Perrie 1972, pp. 128–129).

1.6 Summary of the Theoretical Argument

Table 1.1 summarizes the theoretical argument put forth in this chapter. Depending on whether industrialization was based on locally or externally sourced raw materials it led

[7] Including the Moscow, Tver', Yaroslavl', Kostroma, Valdimir, Kaluga, and, optionally, Smolensk provinces.

to higher or lower peasant unrest due to the prevalence of resource competition or labor absorption channels. Land inequality presumably positively impacts peasant unrest, but the size of this effect depends on the character of industrial development, defined by the industry in question: locally sourced industries could amplify the conflict-provoking role of land inequality, whereas the preeminence of the labor absorption channel could make peasants less dependent on land. Land inequality stands for the disparity in land possession between the mass of communal peasant smallholders and larger privately owned estates or state-owned land.

Table 1.1: Summary of the Dissertation Argument. Effect of Industrialization on Peasant Unrest and its Interaction with the Effect of Land Inequality

Industry Type	Mechanisms	Peasant Unrest	Effect of Land Inequality on Unrest (↑)
Locally sourced	Resource competition channel (unrest ↑) prevails over labor absorption channel (unrest ↓)	High	Larger in absolute terms
Externally sourced	Labor absorption channel (unrest ↓) prevails over resource competition channel (unrest ↑)	Low	Smaller in absolute terms

Mechanisms linking commercialization of agriculture, industrialization, land distribution, and rural conflict are discussed in more detail in Chapter 3, which contains my case study of the large-scale 1902 peasant uprising in the Poltava and Kharkov provinces, and a formal model illustrating my theoretical intuition in a more rigorous way. The next chapter provides evidence that relationships described above were in fact a matter of concern for Tsarist officials, striving to preserve internal stability, and shaped government policies with regard to land distribution and peasant governance institutions.

Chapter 2.

Historical Review

2.1 Introduction

This chapter contains statistical and qualitative evidence providing the necessary historical context for the formulation and evaluation of observable implications of my theory and laying the ground for the empirical analysis. The first part considers the evolution and ideological underpinnings of the state policy towards the peasantry, in particular, the regime's obstinacy in preserving peasant communal landholding. The second part explains in more detail the phenomenon of "allotment land," that is, the part of the landlord's or state land received by peasant communes after emancipation, the relative amount of which could be one of the major determinants of peasant discontent, and which is one of the central concepts used in my dissertation. The third part briefly considers the historical dynamics of industrialization and peasant unrest in the late Imperial Russia and explains my categorization of unrest.

The Tsarist authorities were preoccupied with the problem of social and political stability, and attempted to preserve the idealized communal organization of the peasantry, which was immune to market penetration and had secure inalienability of allotment land, in order to prevent the formation of a purportedly subversive class of landless "proletarians." The total amount of allotment land was not declining over time, and overall peasant landholding was expanding. However, after the three post-

emancipation decades of relative domestic stability (which was nevertheless perceived as a mounting rural crisis), from the mid-1890s, simultaneously with an industrial take-off, peasant unrest started to substantially intensify.

2.2 Government Reaction to Modernization

Since the 18th century it has been typical for European intellectuals to consider private property a necessary prerequisite for economic growth. Almost from the onset this idea coexisted with the awareness of the presumed trade-off between "freedom" or economic efficiency, and stability. This problem started to be felt particularly acutely in the first half of the 19th century, when peasant emancipation and development of free markets were increasingly associated with growing peasant landlessness and impoverishment. The idea that peasant landownership must be "protected," even though individualized, was widespread among economic thinkers of different schools (Khristoforov 2011, p. 53).

Similar to their European counterparts, Russian statesmen, scientists, political activists and artists were preoccupied with potential threats posed by modernization to peasants' well-being and political stability (for a review see Kingston-Mann 1998). Rationalization of peasant landholding and taxation were on the government agenda, and under Nicholas I there were serious steps taken in that direction with respect to state peasants (Kiselev reforms),[1] including partial implementation of the cadastre and tax reform linking taxation to land (in contrast to more "archaic" practices, such as the poll tax or quitrent).[2]

[1]The peasants were represented by two major groups: serf peasants, owned by landlords or factories, and state peasants living on state land and governed by state officials. On the eve of the 1861 emancipation the peasant population was split almost evenly between these two categories.

[2]There were two main types of serf obligations with respect to their landlords: *obrok* (quitrent), that is, a regular monetary payment, and *barshchina* (corvée) – work on the landlord's fields.

Nevertheless, land reform was avoided, and the institution of the land peasant commune (*pozemel'naya obshchina*), seen as a barrier to the emergence of the landless proletariat, remained intact due to fears of political upheaval. In the 1840s, there appeared an additional rationale for the preservation of the commune as a reflection of the "national spirit" and tradition, influenced by the idealization of the peasantry, which was especially strong in Germany. The idea of the Russian peasant commune was to a large extent popularized by August von Haxthausen, a conservative German writer and economist, who traveled across European Russia in 1843. Among other things, he extolled the commune's alleged traditional collectivism and resilience to proletarianization, even at the expense of economic efficiency. He was in favor of serf emancipation, but against premature elimination of former landlords' guardianship and giving peasants freedom without land. These ideas affected Slavophiles, who supported the emancipation of serfs, but with land, and the preservation of communes (Khristoforov 2011, pp. 62–68, 85–92, 94).

Concerns relating to the maintenance of social order and prevention of the growth of inequality and "proletarianization" of the peasants, especially in a situation of a limited administrative, police, and tax capacity, lead to the establishment and perpetuation of effectively inalienable communal landholding as a part of the 1861 emancipation reform (Khristoforov 2011). The land conditionally received by the peasants (first serf, and then state) as a result of the emancipation was granted on the terms of communal holding, which lead to the introduction of formalized communal institutions even in the territories where land communes had previously been nonexistent (in particular, Western provinces), and where the land had traditionally been owned by individual households (*podvornoye zemlevladeniie*).

The newly created parish (*volost*) peasant self-governance units, separated from other social estates, pursued the purpose of minimizing external influences on the peasants,

including unwelcome interference of former landlords.[3] On the one hand, it was accountable to state officials, who were constantly requesting information or assistance; on the other hand, such functions as within-commune land allocation (where repartition was allowed), determination of household distribution of collective tax obligations, dispute resolution, public goods provision, and funding were to be decided by local peasants.

By the 1870s among the state officials and educated society at large there had developed a strong sense of an "agrarian crisis" and impoverishment of the peasantry, although that is not supported by the available statistics (Yaney 1982), and dysfunctional peasant self-governance. However, the authorities, due to objective infrastructural constraints, fears of instability or ideological precepts, were loath to embark on radical reforms. Interestingly, by the 1880s the discussions at the top became less pragmatic than in the previous two decades, and were increasingly based on abstract notions and normative ideals of rural life and social order (Khristoforov 2011). Peasants' ties to land supported by the commune came to be seen as the essential feature of Russian uniqueness and the foundation of the Russian state. It was acknowledged in official documents that "the concept of personal property was completely alien to the living conditions of the native (*korennoi*) peasant population," and that communal landholding was not regulated by general civil laws (Khristoforov 2011, p. 321).

State officials and statisticians adopted the paternalistic logic of the state providing its subjects with productive resources sufficient to acquire the means of subsistence and to perform required obligations, and shared the belief that

> ...the Empire's longevity hinged on addressing the issue of peasant access to land in the Empire's European core, on solving the "agrarian question" so

[3]The peasants still had limited representation, along with landowners, merchants, industrialists, and professionals, in elected *zemstvos*, province- and district-level self-government bodies (Nafziger 2011).

> as to increase peasant productivity while maintaining rural political stability and support for the regime (Darrow 2018 p. 242).

Capitalist development came to be seen as a threat to the established order. The Tsarist authorities were especially concerned with the penetration of commercial and monetary relations in the peasant communes, and tried to hamper this process, even going as far as excluding their direct contact with tax officials (Kotsonis 2014).

The majority of the special conference within the Kakhanov commission, established in 1881 to work on the reform of sub-national government, agreed that the "market sale of peasant allotment land had allowed 'all sorts of plunderers' access to the economic decision making of village assemblies and 'free rein to exploit the dark mass of the peasantry"' (Wcislo 1990, p. 89). Disappointingly, noble landowners seemed to experience overall decline and "were themselves succumbing to market forces. Their family estates were falling 'into the hands of upstarts [*raznochintsy*] of every sort' and 'townsfolk [*meshchane*]' were taking up residence in the village" (Wcislo 1990, p. 89). The latter categories were considered to be "'morally deficient' people from whose ranks came the 'so-called *kulaks* and *miroedy*' "[4] (Wcislo 1990, pp. 89–90). There were concerns that local nobility members were engaging in commerce and losing ties to the land, which would lead to their disintegration as an estate and made them unsuitable for even informal guidance and guardianship over the peasantry (Wcislo 1990, pp. 93–94).

The state still tried both to preserve the institution of the commune and to mitigate its arguable adverse effects on agricultural productivity, such as disincentives to investment created by periodical land repartitions between members. For example, in December 1893 a law was issued that set additional restrictions on land turnover: the individual peasants who redeemed their land could take control of their allotment (*nadel*)

[4]Largely synonymous terms with a negative connotation, denoting "peasants engaged in commerce (*perekupka*), speculation and usury" (Il'yinykh 2016).

only with the consent of the 2/3 of the communal assembly, and this land could be sold only to members of the commune.[5] Several months earlier, another law set the minimal term of twelve years between general repartitions of the communal land, and also restricted partial repartitions; the assembly decisions on repartitions had to be verified by land captains[6] and district officials (Terner 1896, p. 263; Zyryanov 1992, p. 52).

Nevertheless, despite strong beliefs in conservative circles that "communal peasantry ensured social stability in an era when agrarian capitalism created impoverishment and grounds for economic conflict" (Wcislo 1990),[7] from the 1890s the authorities, initially under the leadership of Witte, the minister of finance, promoted industrialization and undertook reforms of peasant society. Most official restrictions, intended to control peasant migration and insulate peasants from modernizing influences, but still keep them as solvent taxpayers, existed until the early 1900s and the 1905–1907 revolutionary events, when the regime, having lost faith in the ability of the peasant commune to forestall unrest, eventually embarked on a large-scale privatization of communal land (Zyryanov 1992). Prior to that the peasants' mobility was strictly regulated. Any long-distance travel required authorization from local authorities, and extremely burdensome terms of exit from the commune and retaining their land plots binded peasants to the places of their original residence.

To what extent did the fears and expectations of authorities and their policies toward

[5]In the justification of this bill, proposed by the Minister of Interior, it was claimed that ""The free proliferation of [private] property is possible only in the context of Western Europe... It is necessary to preserve the land's meaning as the untouchable fund. It is necessary for the peasants to retain allotments and save the foundation of the state"" (Khristoforov 2011, p. 333).

[6]The institute of "land captains" (*zemskiye nachal'niki*)—appointed officials overseeing the peasantry with broad powers of control and intervention into communal matters—was introduced in 1889 in an attempt to strengthen the state control of the peasantry.

[7]It should be stressed that by that time anti-individualist and anti-capitalist ideas were popular among the literate society in general. Many of them, for example, *narodniki*, tended to idealize peasant communes as well. Most progressive *zemstvo* activists could oppose free alienation of communal land out of concerns for the peasants' ability to pay taxes and self-govern. Some conservatives suggested a transition to individual landholding, but without the right to sell or transfer the land (Khristoforov 2011, pp. 303–305).

peasant communes and collective landholding conform to reality? As far as efficiency is concerned, contemporary research, contrary to the previous views (Gerschenkron 1965), demonstrates that the communes could be actually quite resilient and flexible in economic terms, and made optimal factor allocation and production decisions under the given circumstances (Nafziger 2010, Dennison 2011). Communes adjusted land allotments in accordance with labor endowments of households, but limitations of this process and its short-term rigidity forced peasants experiencing shocks in their household composition to actively participate in rent and labor markets both within and outside the communes (Nafziger 2010).[8]

Widely spread land rent and non-agricultural occupations, such as "local trading and transportation work, production of industrial and craft goods in the home, and migration to factory and service sector jobs" were an indispensable complement to work on allotment land, and "vital for household survival and for the fulfillment of communal obligations" (Nafziger 2010, pp. 388–389). Although the cross-regional variation could be considerable, this and other evidence shows that communes were not autarkic entities with households reliant on family labor. Even so, although they were involved in market activities and could rationally react to shocks in income and factor endowment, the resultant factor allocation was not necessarily efficient, or more efficient than in absence of communal institutions. The predominant majority of households still did not abandon farming, and most of its output was for household consumption rather than sale on the market.

[8]The research was conducted using the household-level data (covering two townships) from a census conducted in the Moscow province in 1898–1900. It is notable that the equalization of household land allotments was still limited given a wide variation in their size and a substantial number of landless households. Land leaseholders were quite a diverse group, but most of the rental transactions took place within the commune. On average, almost half of the time was spent on non-agricultural activities, but almost none of the households fully abandoned agriculture. Interestingly, despite the proximity to the leading industrial centers, the geography of labor migration was not particularly broad: most of the individuals were employed within their parishes (*volosts*), some worked in Moscow or occasionally in other provinces.

Existing research demonstrates that land privatization and facilitation of land sale during the Stolypin reforms increased land productivity, as well as mobility of the peasantry (and thus improved land and labor allocation) due to relieved liquidity constraints (Castañeda Dower and Markevich 2019, Chernina, Castañeda Dower and Markevich 2014). Productivity was often higher on private rather than communal lands, and the prohibition to sell land to non-members was an obvious obstacle to more efficient land distribution and its concentration in more productive hands. Development of large-scale commercial farming, increasing orientation towards cash crops were all the more incompatible with small-scale subsistence farming.

At the same time, land privatization itself could be a source of conflict. As will be shown below, in the decades following emancipation (which involved what can be interpreted as partial land privatization), nobility landownership had largely dwindled and much of its land was acquired by industrialists, merchants, and companies, but most importantly by peasants, individuals or whole communes. The land acquired in this way was considered to be private property. However, this massive reallocation of land did not seem to alleviate peasant discontent because tensions between small-scale subsistence farming and large estates, whoever owned them, continued, and peasant land acquisition was highly unequally distributed because it was accessible only to richer peasants.

The second round of land privatization was the Stolypin reforms, which started in 1906 and were interrupted by the 1917 revolution (yet, in the first decade of the Soviet state before collectivization one component of the Stolypin reforms—consolidation of land allotments—was continued). It did not directly address tensions between communal and large private landholdings, and targeted exclusively the peasant communal land, which now should have been converted to privately-owned household plots (with the household head as the formal owner), which could be sold, but only to other peas-

ants. The privatization of land was largely voluntary, and it seems that the main constraint was the lack of state capacity (Tiukavkin 2001) rather than a dearth of peasant enthusiasm, but yet it was accompanied by numerous conflicts between the peasants who desired to leave the commune and consolidate and title their land allotments and the rest of the commoners (Pallot 1999). Tensions between private and communal ownership remained unresolved until the last days of the regime and beyond that, which was demonstrated by another wave of peasant unrest in 1917 (Finkel, Gehlbach and Kofanov 2017), and the fact that during the Constituent Assembly Elections a higher share of private land in a district was associated with a larger proportion of votes cast for the Bolsheviks (Castañeda Dower and Markevich 2017).

2.3 Post-Emancipation Land Distribution and Allotment Land

After the 1861 emancipation, the landlords' land cultivated by peasants under serfdom was divided into the private possessions of the landlord and the communally-owned peasant landholdings. The authorities defined the maximum and minimum land allotments per male soul for most areas, which served as the reference in the negotiations of peasants and landlords regarding the division of land. It is notable that in line with the government's commitment to enforce the norms of land usage (Darrow 2018), the application of allotment norms led to the artificial equalization of landholding within communes (Khristoforov 2011, pp. 131–133).

The State Treasury directly paid to the former serfowners 75% or 80% of the land value (net of their debts to the state) in securities; the 20% or 25% of the sum should have been paid by the peasants to the landlord via the Treasury immediately in one

installment, and the remaining 75% or 80% (which were formally a Treasury loan to the peasants, *vykupnaya ssuda*) in yearly installments over 49 years (Zaionchkovskii 1960, pp. 138–139). This arrangement was called the "redemption deal" (*vykupnaya sdelka*). The land value was defined based on the yearly quitrent (*obrok*) capitalized as a perpetual annuity at the interest rate of 6%, and at the time of the deal far exceeded the market price of the land in areas with less fertile soil and more widespread quitrent, but less so in corvée areas with more profitable agriculture (Gerschenkron 1965).

During the initial two-year transition stage the peasants and landlords had to sign "regulatory charters" (*ustavnyye gramoty*) specifying the amount of land allotted to the peasants and their obligations. By early 1863 only half of the peasants signed the charters, but almost all of them were effectively enforced by 1864 (Moon 2014, pp. 94–96). The regulatory charters then had to be converted to "redemption acts" (*vykupnyye akty*) in order to start the process of redemption; prior to that the peasants remained in the state of "temporary obligation" (*vremennoobyazannyye*), in which they continued to pay quitrent or perform corvée for their former owners, while the landlord retained some administrative and police powers over the peasants. Due to peasant resistance, the process of the signing of redemption acts was gradual, and by 1881 15% of peasants still were "temporarily obligated," which was forcibly terminated in 1883 (Zaionchkovskii 1960). Former state peasants received their allotments later than former serfs, in 1866, and their redemption started only in 1886.

Although these measures had the potential to alleviate peasant discontent, which is also demonstrated by my research, they failed to produce domestic peace. Under serfdom the landlord's land was usually divided in different proportions between the landlord's "demesne" and the land held by serf households. After the emancipation the peasants received (even if collectively and conditionally on redemption) only a part of the land which they had used to work on, and in order to retain a habitual cultivated area

they had to rent land from their former masters, who could use this acute demand for land to make peasants work on their "demesnes" in return, and on unfavorable terms (see Zaionchkovskii 1960). The peasants still cultivated the landlords' land as tenants (land rent for subsistence purposes seemed to be prevalent, according to Anfimov 1961), hired laborers or sometimes private owners, but less secure access to it accompanied by growing demand due to population growth, could breed discontent.

Taking into account data availability and contextual evidence, the share of allotment land (*nadel'naya zemlya*), that is, *the part of formerly landlord or state land that was transferred to the peasants' communal ownership on redemption terms*, is used as the measure of land inequality central for this study. The authorities distinguished this land category as the minimal stock of land the possession of which should have been guaranteed to the peasantry, and imposed heavy restrictions which made its transfer to the non-communal owners almost impossible. As I showed in the previous subsection, retention of collectively owned allotment land in peasants' hands was seen by Tsarist officials as one of the cornerstones of the ruling regime's survival before the Stolypin reforms, which started in 1906.

After emancipation, individual exit from the commune with land was possible only upon payment of its full value to the Treasury, and since 1893 it required the consent of 2/3 of commoners and could be sold only to them. Until 1870 it was prohibited to both former serf and state peasants to dispose of their allotments for whatever reason (Khristoforov 2011). Thus, even at the redemption stage most peasants remained effectively attached to their land allotments, which were held by communes and couldn't be sold until fully redeemed (quite a rare occasion). Redemption payments were eventually abolished only in 1906 in response to mass peasant disturbances (see, e.g., Gerschenkron 1965).

The absolute and relative amount of allotment land was to largely determined dur-

ing the emancipation, and depended on soil fertility, distribution of land among different uses, presumed loyalty of local landlords to the central government, prevalence of non-agricultural occupations, and other factors (Zaionchkovskii 1960). Allotment size norms were lower for areas with more fertile soil (especially Central Blacksoil region), and higher where the land was more abundant or underexploited, like the Southern steppes. In the Western provinces (Right-Bank Ukraine, most of Belarus and Lithuania), dominated by disloyal Polish landowners, the peasants could retain all of the land designated to them before the emancipation, and the state even intervened to subvert attempts of the landowners expecting emancipation to reduce peasant allotments.

Thus, whereas in most European provinces the peasants lost from about 10% to 40% of their serf allotment area (Moon 2014, p. 100), in these parts of the Empire they received even more land than they had held before the emancipation; they at least partially retained access to "meadows, pastures, woodlands and water sources;" and they enjoyed decreased redemption payments and early, forced termination of the state of "temporary obligation" to their former landlords (Zaionchkovskii 1960; Moon 2014, p. 107). However, the resulting land distribution was still heavily tilted in favor of large landlords. Seemingly more generous allotment norms did not automatically convert to larger shares of the allotment land. The Western provinces, where the terms of emancipation were among the most favorable, turned out have the lowest percentage of allotment land and the highest level of rural conflict. This happened because of the more unequal pre-emancipation land distribution, and the percentage of non-arable land (forest, pastures and meadows): the higher was the latter, the lower was the relative amount of allotment land, given that the focus of the redemption deal was on arable land. Nevertheless, the lack of non-arable resources could also be an important source of conflict.

It can be argued that the share of allotment land, which was largely excluded from market exchange, captures one of the most important and consequential aspects of land

inequality in the late Russian Empire. In line with state intentions, it could serve as a source of minimal subsistence, and an insurance mechanism.[9] For example, it has been shown that during World War I, because of the large-scale military draft, the peasants remaining in the countryside seemed to redirect their labor effort to allotment land, securing at least partial subsistence, rather than working on private estates (Dower and Markevich 2018).

The total distribution of land resources by main categories is presented in Figure 2.1:

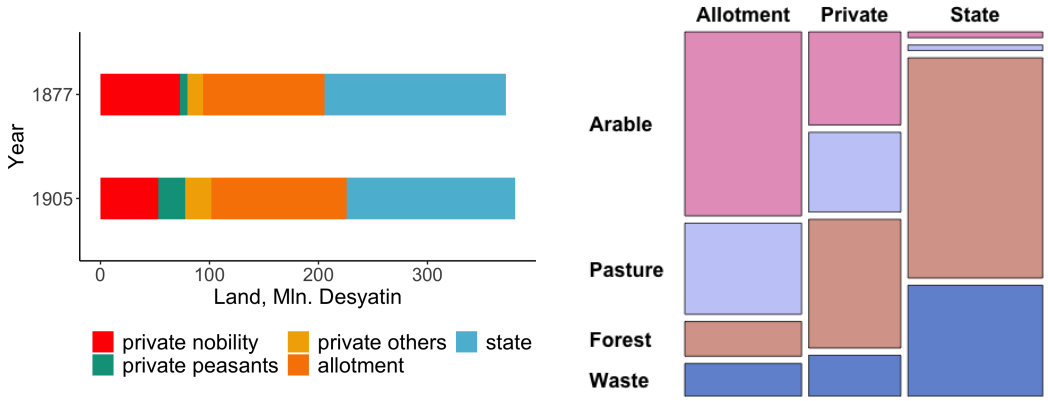

Figure 2.1: Land distribution in the European part of the Russian Empire. *Left:* by owners in 1877 and 1905; *right:* by owners and land type in 1881. Sources: TsSK MVD 1907. 1 *desyatina* = 1.09 ha. The "Pastures" category includes pastures and meadows.

It can be seen that the total amount of land did not change a lot between 1877 and 1905, the period for which there exists comparable data of land censuses. This happened despite the authorities' alarmist sentiments justifying the adoption of further restrictions on the allotment land sale in the 1890s (Khristoforov 2011, p. 347). Allotment land

[9] As Darrow puts it, "Norms converted the old regime's *nadel* [land allotment] of serfdom into a modern normed entitlement that reflected the state's moral commitment to the peasantry. In this sense, the normed *nadel* represented a new moral economy of a Bismarckian sort, a proto-welfare state program whereby the government organized aspects of the economy in the name of sociopolitical and economic stability" (Darrow 2018, pp. 242–243). As formulated by Viktor Leontovich, "The land provided to peasants constitutes the property [*imushchestvo*] which is granted in order to maintain their existence as peasants" (Khristoforov 2011, p. 188).

somewhat expanded, both in absolute and relative terms, probably at the expense of the state landholdings: there was a total rise from 112 to 124 mln *desyatina*, and from 30% to 32.6% of all the land. At the district level, the amount of allotment land could go up and down, but the within-district variation across time is much smaller than differences between districts.[10]

The nobility's possessions noticeably declined, but private landholding in total was rising: the land was purchased by peasants, merchants and urban dwellers, both individually and in partnerships, sometimes by whole peasant communes. The total peas-

[10] The causes of the district-level changes in this indicator registered between 1877 and 1905 are not quite clear. We can see that absolute changes in the amount of allotment land could either exceed changes in the total amount of land or even go in different directions, which suggests that at least part of this shift was not due to the expansion or contraction of the land "suitable" for agricultural activities (*udobnaya zemlya*), but due to the switching status of some land between communal on the one hand, and private and state property on the other hand. Although I do not have enough information to disaggregate the dynamics of allotment land by its sources, I can try to list possible causes and see what the theoretical and empirical implications are.

The percentage of allotment land could change due to changes in the total area of "suitable" land, which could be a consequence of land reclamation or abandonment, and to a different extent affect the size of peasant allotments. It is possible to imagine the existence a confounding factor related to peasant living and farming conditions that drives both peasant unrest and demand for additional land, however the direction of the bias is unclear. For instance, relative impoverishment and backwardness could lead to the depletion or insufficient cultivation of land, or conversely, to increasing demand for land and its extensive exploitation. In the latter case the bias goes in the direction opposite to the hypothesized negative relationship between unrest and the share of allotment land.

Another possibility was an authorized expansion of peasant allotments at the expense of state land, including the land held by the Peasant Land Bank. There is evidence of such practice: for example, before 1905 allotments were increased in the Olonets province (TsSK MVD 1907, p. 185). Olonets, along with the Perm', Vyatka and Vologda provinces was among the those which experienced the highest absolute expansion of allotment land in 1877–1905 (TsSK MVD 1907, p. 180), and which also had some of the largest state land reserves which could be potentially distributed (TsSK MVD 1907, pp. 178–179). After the 1905–1907 events the authorities planned to distribute more land in order to alleviate the problem of land shortage among peasants (TsSK MVD 1907, p. 178). The level of redistribution could depend both on the acuteness of land shortages and availability of state land reserves. Once again, especially with respect to the first mechanism, we can expect that the bias goes in the opposite direction.

The third possible cause could be the selling or privatization of the allotment land. However, prior to the Stolypin reforms, privatization and sale of allotment land was quite rare due to legal constraints and specific practices of peasant landholding. According to available figures, in about three decades before the early 1890s the peasants prematurely redeemed only about 0.5% of allotment land, and 2/3 of this amount remained in the communes (Terner 1896, p. 280). Moreover, more widespread individual exit and the resultant contraction of allotment land in a given area could be a sign of the commune weakness, also diminishing its mobilization potential. Consequently, the possible bias should also be positive, whereas our hypothesized effect of interest is negative.

ant landholding was expanding. By 1905 peasants in one way or another possessed over 40% of all the land, or about 2/3 of the land excluding state holdings, mostly consisting of forests and wasteland, which makes them look even less disadvantaged with respect to land access. One might argue that the importance of allotment land had been falling with time, but we should be cautious drawing such a conclusion, given that its share in total peasant land property only fell from 94% to 84%.

Let us more closely consider other categories of peasant land ownership. The communes could buy additional land, which was not subject to restrictions imposed on allotment holdings. In accordance with the official classification, private landholding included this communal non-allotment ownership, which, however, was quite limited, and between 1877 and 1905 rose from 0.2% of the total amount of land and 0.7% of all communal holdings to 0.9% and 2.9% correspondingly. Therefore it was unlikely to make much difference; moreover, additional land could be afforded by already relatively well-off communes.

In terms of the satisfaction of "land hunger," private land acquisition by peasants failed to make much difference due to its limited scale (14% of peasant landholdings by 1905) and highly unequal distribution, as it was available only to a small minority of richer peasants (Lindert and Nafziger 2014, pp. 778–780). In the district-level empirical analysis in Chapter 4, in some specifications I replace the share of allotment land, which is my main land inequality indicator, with the total communal or peasant-owned land. The results are similar, but the relationship of the latter two measures with peasant unrest is somewhat weaker.

Another issue is whether more traditional comprehensive measures of land inequality, such as the Gini coefficient, may serve as a more relevant measure of inequality. First of all, unfortunately, the data on the distribution of allotment land among peasant households or individuals is absent. We only know how it was distributed be-

tween communes based on the average allotment size in each commune. Information on within-commune distribution is available only for some local *zemstvo* household censuses in certain years. In addition, many communes still practiced periodic repartitions, redistributing land between families in accordance with changes in the number of laborers or consumers (Zyryanov 1992). Therefore, it is often problematic to treat allotment land as household or individual property. Even if we had information sufficient to calculate Gini indices of total landholding, they would conflate land of different ownership and usage status, which can complicate their interpretation. Below I use available Gini indices of private land and inter-communal distribution of allotment land in 1905 in some specifications, and they do not seem to be significantly related to unrest.

I argue that of all the available indicators, the division of land between the allotment and the remaining land bears the most direct relationship to the genesis of rural conflict. There is no doubt that conflicts within and between peasant communes regarding land distribution were pervasive. However, at least prior to the Stolypin reforms, they seemed to be less politically consequential and less likely to be of large enough scale to enter the chronicles of peasant disturbances. More important were attacks on private and state property or individuals, often made collectively by commune members. Proximity of peasant communes, depending on increasingly insufficient communal allotment land, to highly concentrated private lands, owned by the nobility, merchants, companies or well-off peasants, perpetuated the conflict.[11]

Collective desire for the acquisition of more land and other resources at the expense

[11] Allotment land share as a measure of inequality can also reflect the concept of "labor-dependent" or "labor-repressive" agriculture (Moore 1966, Albertus 2017), which, according to Albertus, should capture "the prevalence of agriculture laborers who are dependent economically or socially on landlords and large landowners for their likelihood" (Albertus 2017, p. 249). The lower the share of allotment land, the higher the peasants' potential dependence on large private landowners, because those lacking enough communal land had to either buy it (which was prohibitively costly for most peasants), or more likely to rent it. At the same time, as a result of deliberate state policies, the predominant majority of Russian peasants still owned a certain amount of land on communal terms.

of private and state holdings was one of major forces behind peasant unrest, and it became especially clear in 1917, when state retrenchment amidst a deep socio-economic and political crisis allowed these intentions to materialize. Of course, all aspects of land inequality mattered for conflict, but the total communal land ownership, as opposed to other categories, constituted the most important part of the story. Land renting was widely used by peasants, and its terms might have been cumbersome and worsening with time (Anfimov 1961). Obviously, the rented land could not serve as a perfect substitute for the land in ownership, and reliance on it could only amplify discontent, as will be shown below.

The share of the allotment land in a given locality could also be more important than absolute ownership of land by the peasants: when there was not much private or state land to occupy, then the ground for conflict was much weaker, irrespective of how much land the peasants had.

Getting back to the issue of state property, although the state seemed to amass huge land resources, they primarily consisted of forest and wasteland, as shown in the right panel of Figure 2.1, and were concentrated in sparsely populated areas with a colder climate, not always suitable for farming. The preeminent focus of the emancipation deal was to provide the peasants with arable land; therefore, most of it was already accumulated in the hands of the communes, whereas almost all forests and a substantial share of pastures, meadows and arable land remained in private and state hands. Given that forests were an important source of fuel, building materials, food and forage, whereas pastures and meadows were indispensable for cattle grazing and winter feeding, getting access to forests could be critical for the peasants. On top of that, the peasants could also see the dilution of previous social responsibilities on the part of landlords, such as provision of food aid, temporary credit, and guaranteed access to land.

2.4 The Russian Empire: Industrialization and Peasant Unrest

The Russian Empire entered a period of "modern economic growth," characterized by rapid industrial and substantial agricultural development standing from the 1880s (Gregory 1982). Figure 2.2 plots the estimates of nominal output and the number of workers made by V. E. Varzar and L. B. Kafengauz (Strumulin 1966, p. 508), which are available from 1887 on, and the aggregated enterprise-level data that I have collected for the dissertation (see their description below). The Varzar-Kafengauz estimates encompass the whole Russian Empire, while mine take into account only its European part, which should mostly explain the difference between them.[12]

These data reveal a "takeoff" taking place at least since the mid-1890s, but in real terms the contrast between the average growth before and after this period does not seem to be so spectacular (e.g. see Markevich and Nafziger 2017, p. 37), and is closer to the changes in the number of workers.

Fast industrial growth was accompanied by growing domestic instability, which in the case of peasant unrest eventually (in 1905–1907) surpassed even the previous major wave of contention provoked by the emancipation of serfs. The yearly dynamics of peasant unrest is presented in Figure 2.3. Due to data availability limitations, the timespan does not cover the period of 1905–1907, which was characterized by massive popular unrest involving all classes of society. The peasant unrest reached very high lev-

[12] A more precise comparison is possible for the year 1900, for which a regional layout is available (Kafengauz 1994, p. 63). According to Kafengauz, the number of workers in the European part was 1,877.1 thsnd, and the output was 2,857.9 mln roubles, which almost coincides with my estimates of 1,858.9 thsnd workers and 2,822.2 mln roubles. Note that my data omit a few copper-melting factories and all the mining industries. It can be seen from Figure 2.2 that the dynamics of the alternatively calculated indicators mostly coincide. These similarities are not surprising given that their ultimate underlying sources are the same, but they demonstrate the overall congruency of my figures with the best estimates available.

els during the first few years of the emancipation reform, but soon subsided. A spurt of unrest in the first half of the 1880s could be partly associated with the 1883 compulsory termination of the state of the "temporary obligation" of former serfs and transition to land redemption, which obliged those peasants and landlords who by that time hadn't settled the terms of land division to do so (Nifontov and Zlatoustovskii 1960, pp. 16–17). There seems to have been an intensification of unrest around the early 1900s, even before 1905. A comparison with Figure 2.2 suggests that it went alongside the acceleration of industrial growth since the mid-1890s.

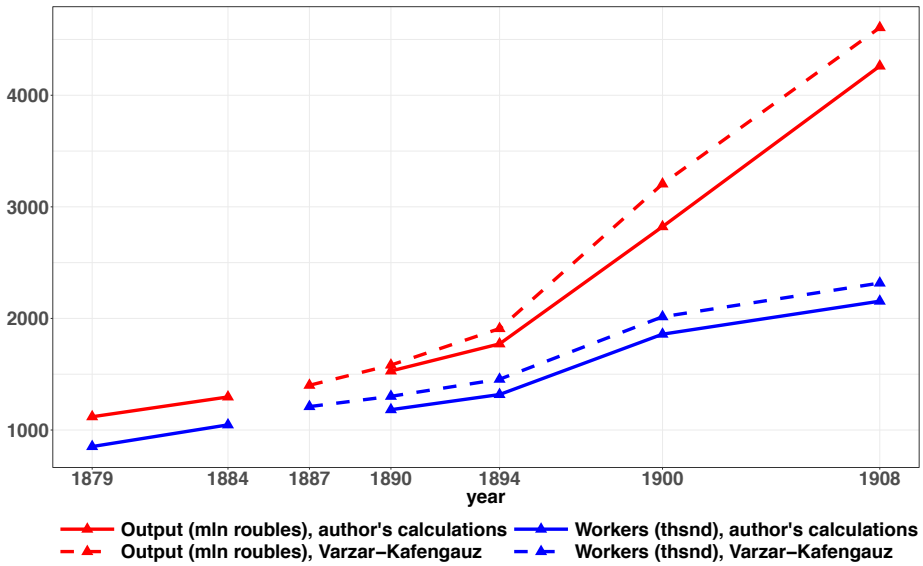

Figure 2.2: Nominal output and number of workers. My estimates: the European part of the Russian Empire in 1879, 1884, 1890, 1894, 1900, and 1908. Varzar-Kafengauz estimates: the whole Russian Empire in 1887, 1890, 1894, 1900, and 1908 (Strumulin 1966, p. 508).

Breaking unrest into categories can help us understand its nature and dynamics. Figure 2.4 shows composition of unrest within approximately equal periods.[13] The categories reflect phenomena which served as causes of disturbances, underlay peasant

[13]I have coded these data using the "Chronicle of peasant movement", published in Soviet times. The sources of these data and my methodology will be explained in Chapter 4.

discontent, and were its targets. The single most important category is the general land-related unrest. Most typically it could be the seizure or illegal occupation and usage of arable land, pastures, and forest, illegal cattle grazing and timber cutting, and other explicit manifestations of conflict over ownership, lease, utilization, and delimitation of arable land, pasture, meadows, and forest plots.

Figure 2.3: Yearly dynamics of the peasant unrest (1863–1904 and 1908–1913) in the European part of the Russian Empire. Raw count of events, unweighted. Sources: Table 4.3, author's calculations.

The category of non-land property unrest referred to all the remaining encroachments on immovable and movable assets on the part of peasants. Typically those were arson and destruction of private estate buildings; seizure of grain and other agricultural products, conflict over non-land assets, such as mills or fishing ponds. It is important to note that, while available descriptions of unrest episodes of this type do not explicitly mention land-related conflict, in fact, it could often be the actual motive behind the acts of theft, robbery and violence. For example, the peasants could secretly or openly set fire to private houses and farm buildings of local landowners in order to extort concessions or make them leave their estates and abandon their landholdings (which was

particularly widespread in 1905–1907; see Senchakova 1989).

Administration-related unrest usually consisted of cases of dissatisfaction with the local administration, unauthorized reelection of its officials, and disruption of its functioning. Tax and debt-related unrest was often refusal to pay taxes or other state obligations, in particular, redemption payments for the allotment land.

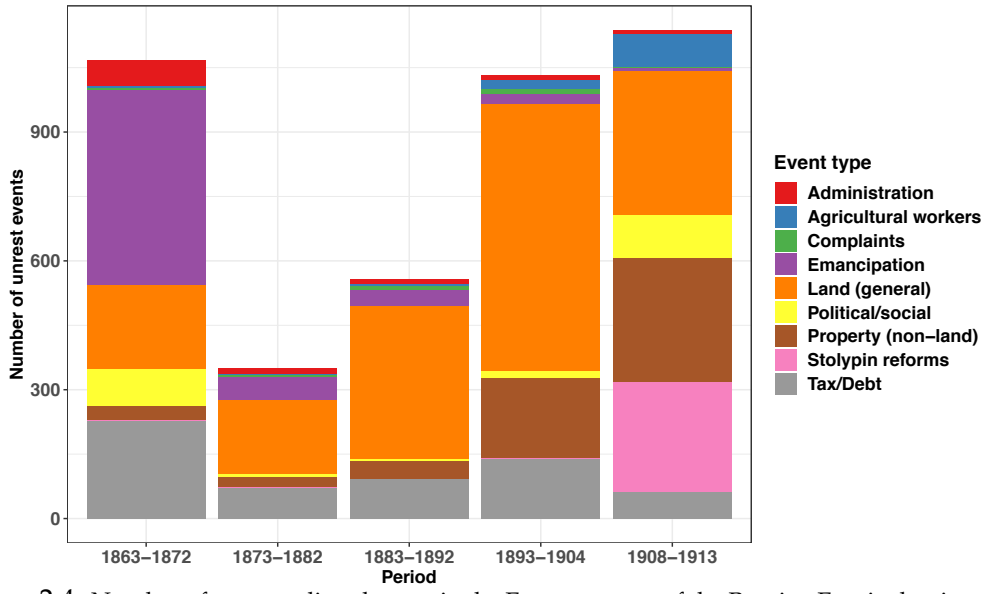

Figure 2.4: Number of peasant disturbances in the European part of the Russian Empire by time period and unrest category. Sources: Table 4.3; author's calculations.

Emancipation-related unrest was mostly associated with land distribution settlement between landlords and peasants, and the latter's temporary obligations to the former, while unrest related to Stolypin reforms typically involved intra-communal conflict between those who wanted to leave the commune and consolidate their plots, and the remaining commoners. These two categories (in purple and pink below), although both centering on land and obligations conflicts, are shown separately from the remaining land- and tax/debt-related unrest in order to demonstrate their period-specific nature.

The political/social category (yellow) includes cases of illegal propaganda, meetings,

issuance and dissemination of illegal leaflets and brochures, as well as participation in organized movements. Strikes and other disturbances of agricultural workers (blue) are placed in a separate category. Complaints to authorities (green) are also taken separately because their actual causes are not always known.

General land (orange) and other property-related unrest (brown)—land seizure and occupation, theft, robbery, arsons—together constituted the largest category in all periods except for the years immediately following emancipation. Disputing and violating land ownership, usage and transfer rights, illegal timber cutting, stealing food and forage supplies have been widespread during all the periods considered, and particularly intensified by the turn of the 20th century. In the wake of the 1861 reform the peasants were preoccupied with the terms of liberation regarding distribution of landholdings and obligations to former landlords and the state. As time passed, resistance to the arrangements abated, more peasants were signing buyout contracts (*vykupnaya sdelka*) ending their temporary obligation status, and acquiring land ownership conditional on making redemption payments to the state. Yet, these developments ultimately failed to prevent resumption of large-scale conflict often rooted in the emancipation-time arrangements.

Implementation of the Stolypin reforms, involving privatization and consolidation of communal land, from 1906 on provoked significant unrest, which even seemed to crowd out other property-related conflicts. Tax/debt-related unrest was high right after emancipation, then dropped, grew until the turn of the century, and then dwindled after the 1905-1907 Revolution. This dynamics can possibly be associated with the peasants' initial dissatisfaction with the state implementing the emancipation reform, and eventual abolition of redemption payments in 1906. Political/social unrest, noticeable during emancipation, once again gained prominence during and after the 1905–1907 revolution, which reflected intensified activity of revolutionary parties and organizations, as

well as increasing responsiveness of peasants to their messages and politicization of disturbances. A noticeable amount of agricultural worker disturbances was registered in 1893–1904, and it considerably expanded thereafter. It might have been a consequence of the spread of large commercialized farms relying on hired labor.

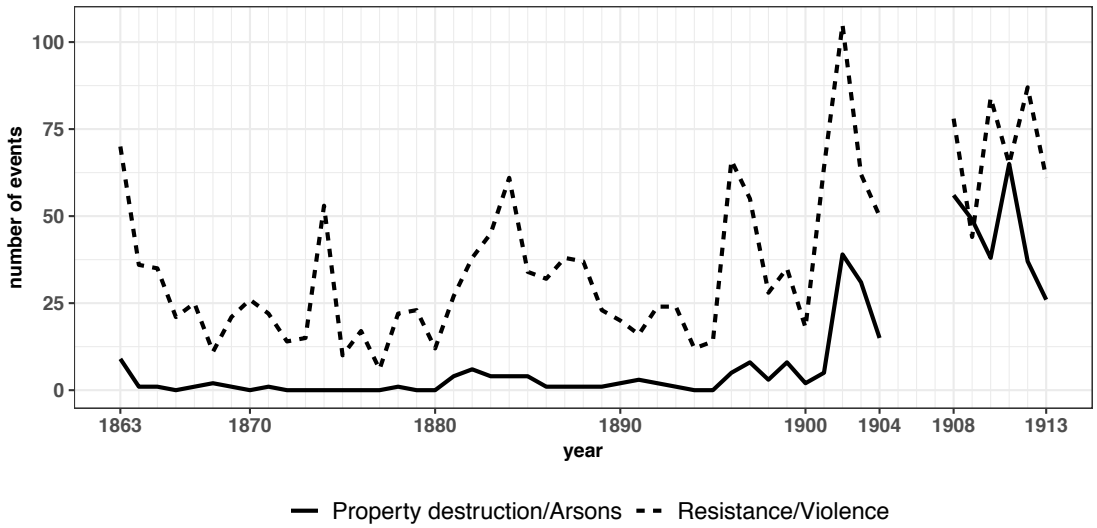

Figure 2.5: Dynamics of peasant resistance, violent clashes, and attacks on property. Sources: Table 4.3; author's calculations.

The difference between 1893–1904 and 1908–1913 shows ongoing intensification of the rural conflict even after the mass 1905–1907 unrest waned: six post-revolutionary years saw more conflict events than the pre-revolutionary decade. Interestingly, while property-related unrest (even excluding Stolypin reform-related) was still a major category, its composition radically shifted towards direct encroachments on non-land property. It may be interpreted not as an overall decline of land-related conflict, but, on the contrary, the conflict taking an increasingly violent and subversive turn. It can be illustrated by Figure 2.5, which portrays the dynamics of the two indicators. First is the unrest events involving the resistance of peasants to certain measures (e.g. land measurement, tax collection, etc.) or violent clashes with officials or civilians. The second

is assaults on and the destruction of private or state property, including arson. Both categories had their ebbs and flows, but in the early 1900s and from then on, the latter category suddenly jumped up from almost zero, and resistance/violence reached its peak levels.

Figure 2.6: Peasant unrest by target. Targeting private landowners includes encroachment on their land and other property, as well as personal attacks. The event count is not mutually exclusive: a given unrest episode can have more than one target. Sources: Table 4.3; author's calculations.

Instead of making direct claims to land parcels in dispute, temporarily occupying and utilizing them, the peasants increasingly turned to disruption of landowners' farming processes and destruction of their property, including housing. It might be partly a result of repressive measures against the 1905–1907 movement, which made peasants adopt activities allowing for a greater anonymity of participants, such as arson, but it also could be a consequence of intensified animosity between the classes of the rural population. The possessions of private landowners almost always have been the main target of peasants participating in unrest (Figure 2.6). Civil, police, and military officials

were relatively frequently attacked, and the intensification of unrest urged the authorities to use the police and army more often. Other peasants became a common target only with the Stolypin reforms.

This intensification of rural conflict cannot be straightforwardly explained by worsening material conditions. Despite the growing population and fractionalization of peasant landholdings, agricultural productivity along with consumption standards were on the rise (Gregory 1994, Mironov 2012), and the situation could not be characterized as an "agrarian crisis" presumed by earlier authors (e.g. Gerschenkron 1965). In this dissertation I consider more subtle mechanisms based on conflicts and disparities emerging as a result of uneven development and ownership and usage of productive resources. Historical research shows that much of the conflict was over land distribution and usage, most prominently between peasants and landlords. It remained unrelenting throughout all of the post-1861 period,[14] and became a defining feature of peasant disturbances during the revolutions of 1905–1907 and 1917 (Dubrovskii 1956, Asher 1988, Malyavskii 1981, also Finkel, Gehlbach and Kofanov 2017).

2.5 Conclusion

This chapter shows the that the state policy towards the peasantry was shaped by concerns for social stability and idealized notions of the peasant land commune, an instrument of social and economic control. Until the 1905–1907 revolutionary movement most of the ruling elites shared the opinion that the peasants should have been bound to the land in order to avoid their proletarianization, and the effectively inalienable allotment land in communal ownership (the share of which will be one of the central indicators

[14] Finkel, Gehlbach and Olsen 2015 show that contrary to the elites' original goals, 1861 emancipation provoked rebellion of former serfs, probably because of their disappointment with its implementation controlled by local nobility.

in my quantitative analysis), which the peasants received after the emancipation, was the central element in this scheme. However, despite the efforts to prevent peasant unrest, it intensified noticeably and became more violent by the turn of the 20th century. My analysis will further show that greater land redistribution in favor of the peasants indeed could mitigate unrest, which was especially critical in the absence of alternative employment opportunities.

Chapter 3.

1902 Poltava–Kharkov Peasant Uprising Case Study and Formal Model

3.1 Introduction

This chapter examines the causes of the 1902 peasant uprising in the Poltava and Kharkov provinces and considers a formal model providing additional insights in the peasant-landlord relations responsible for the occurrence of such episodes. I show that the uprising was closely related to the peasants' discontent with growing commercialization of land rent, especially on the part of large estates, and that whereas industrialization offered greater opportunities for non-agricultural employment and out-migration, which could potentially alleviate discontent, it failed to do so when it led to increased competition for land and other resources used in agriculture.

The 1902 peasant uprising in Poltava and Kharkov was a large-scale event which resonated among all the strata of Russian society and was a harbinger of the 1905–1907 revolutionary events that shook the whole Empire. It started in the Konstantinograd district (*uezd*) of the Poltava province (*gubernia*)[1] in 1902 in mid-March, and then spread to nearby areas. The uprising lasted for three weeks, and the authorities had to use

[1] In the text I will often mention such administrative units as *gubernia* (province), *uezd* (district) and *volost* (parish, a district subdivision), therefore I will use English translations of their Russian names for convenience.

military force in order to suppress it (Sliusarskii 1961, p. XIX). According to official estimates, 4,000 households with about 16,000 peasants in total, living in 112 "rural societies" [2], took part in the disturbances in the Poltava and Konstantinograd districts of Poltava province. In the the Valkov and Bogodukhov districts of the Kharkov province, bordering Poltava, 62 "rural societies" with 22,000 peasants experienced disturbances (Sliusarskii 1961, p. XVIII).

There are three major reasons for the selection of this case for close examination. First, it was a prominent episode, involving thousands of participants and virtually unprecedented since the time of serf emancipation, and hence should not be ignored by any study of peasant unrest in the Russian Empire at the turn of the 20th century. Second, and partly following from the first point, it is well documented, and many documents are systematized and published, which can be readily taken advantage of. Drawing on these sources, complemented with statistical data, I have been able to produce a comprehensive description of the event and its causes. Third, unlike the 1905 revolutionary events, which started in the capital and promoted the expression of discontent and mobilization of peasants all over the Empire, this event can be interpreted as "endogenous," that is, arising primarily from local conditions and developments. Potentially it can facilitate the detection of structural, as opposed to contingent, determinants of unrest.[3]

This case study pursues *exploratory* purposes (Gerring 2017): I have used it in order to understand the factors causing peasant unrest and underlying causal mechanisms, and to build a theory presented in Chapter 1. Its analytical value and illustrative power transcends its initial, admittedly technical goal, and therefore I present it as an individ-

[2] In Russian, *sel'skiie obshchestva*, administrative units which usually included one or several nearby villages.

[3] I have no intention to downplay the importance of peasant agency, propaganda by revolutionary parties and organizations, or major political events in the genesis of rural conflict and its intensification, but in my dissertation I put emphasis on its structural determinants, which in fact could gain more salience in conjunction with the aforementioned phenomena. My in-depth study of the uprising and the comparative analysis of the districts of the Poltava province helps disentangle between these factors.

ual chapter of my dissertation.

My main findings can be formulated as follows. It turns out that the district where the disturbances started had the lowest share of allotment land (received by peasants after the emancipation), which could make peasants more dependent on rented land, and also the smallest percentage of households with migrant laborers (which could mean particularly low non-agricultural earnings). My argument is that it was the disparity in possession of communal and privately owned land that mattered for discontent. As will be demonstrated, peasant disturbances were not just spontaneous spurts of blind hatred, but had a more or less clear purpose of acquisition or outright seizure of food, forage, timber and land. The point is that a *land shortage itself might not have been sufficient to provoke unrest, there must have been enough private or state land to become the subject of peasant claims*. In order for the grievance caused by the inadequate supply of land to transform into action, there must have existed an object of this action.

The hotbed of the uprising was the territory occupied by a huge commercialized and industrialized estate, increasingly reliant on large-scale tenants, either occupying the land formerly available to the peasants or subletting it at higher rates. The villages suffering particularly severe land shortage played the most important role in its beginning. Mass looting and property destruction also affected sugar refineries in the neighboring Kharkov province. Summarizing the evidence, I reach the conclusion that industrial development expanding employment opportunities for the peasantry can reduce the discontent provoked by land inequality, but only if it does not simultaneously exert adverse influence on peasant agricultural routines, which, for example, could be the case with the sugar refining industry, which required allocation of land to grow sugar beets.

The analysis of the Poltava-Kharkov uprising provided below consists of two parts (preceded by a section discussing its sources and methodology): the first one contains the description and analysis of the events based on archival documents, and the sec-

ond one is an exploratory comparative case study, which considers a battery of socio-economic indicators for the fifteen districts of the Poltava province in order to see what differentiated the districts in which the unrest originated. The second part serves as a necessary complement, allowing me to triangulate the evidence and verify documentary narratives, take a deeper look at the social, economic and demographic characteristics of the local peasantry, elaborate my theory, and identify the variables to be further used in the quantitative analysis.

The last part of the chapter is a formal model which considers stylized interactions of peasants and landlords. I have followed the "analytic narrative" technique (e.g. Bates 1981, Greif 2006), which entails analysis of real-life cases as a strategic interaction of rational actors (often, but not exclusively, with the help of formal game-theoretic modeling). My model was to a large extent informed by the circumstances of the Poltava-Kharkov uprising, but its results apply more generally and substantiate the theoretical intuition from the previous chapter.

3.2 Sources and Methodology

Document-based study. Information about the sequence of the uprising, its causes and consequences can be found in Veselovskii 1923, Sliusarskii 1961, and Anfimov 1998. The first two volumes are collections of archival documents: one of them was published in the early 1920s, and another by the 60th anniversary of the events. There is almost no overlap in their content, and together they provide enough material for an in-depth study of the uprising. The materials presented in these volumes are police, gendarmerie, procurator and governor reports, dispatches, telegrams, letters and other documents; witness (local landowners, tenants and peasants) interrogation and court proceedings records; illegal leaflets and publications of revolutionary organizations.

Taken together, they provide quite rich and detailed information, which allows me to recreate the course of the uprising and understand its driving forces and the motives of the participants. I have compared multiple accounts of the same occurrences made by various observers in order to create a more or less consistent and reliable picture of these events and their causes and consequences. To my knowledge, there are no scholarly monographs, dissertations or articles (except for introductory chapters in the published collections of documents) comprehensively analyzing the bases of this prominent peasant unrest episode, and mine is the first such attempt to model and quantitatively examine the unrest.[4]

Of course, my approach has some limitations. One of the possible concerns regarding the use of this information is that the official or elite point of view might be heavily overrepresented, as almost all of the documents were produced by state officials (and the remainder by revolutionary organizations). However, valuable transcripts of the interrogations of witnesses (seemingly subjected to some stylistic refinement) give voice to ordinary inhabitants of the area affected by the unrest, and these voices sound quite distinct and give the impression of authenticity. Moreover, there is a surprising resemblance in the interpretations originating from officials, anonymous (and quite well-informed) correspondents of *"Iskra,"*[5] and local peasants. Most of them pointed to the peasants' economic hardships related to the proliferation of market-based tenancy and the worsening conditions of land rent as one of the causes of discontent.

Some officials, including Kharkov governor Obolenskii, whose harsh suppression measures curried much favor with Nicolas II, stuck to a paternalistic discourse, portraying naive peasants seduced by evil instigators into disobedience of "God, Tsar, Fatherland and neighbors," which was followed by deserved punishment and repentance

[4]While there are original source documents about this unrest episode, there is no comparable full-fledged analysis, such as a monograph or dissertation based on these or other documents.

[5]An illegal newspaper published by RSDRP (Russian Social-Democratic Worker Party).

(Sliusarskii 1961, pp. 76–77). Others, however, in their correspondence paid more attention to the economic situation of the peasants and demonstrated a remarkable amount of sympathy towards the peasants' plight. Of course, it could also be a reflection of general resentment of capitalist development, which permeated all social strata at the time, and fear of any challenges to social stability.

The second major concern is my reliance on the sources published in Soviet times, which could have been compiled selectively in accordance with ideological purposes. There is no doubt that a deeper archival study would made it possible to expand the range of sources and get a more comprehensive and maybe more objective account of the events, but in any case the available information does not seem to be ideologically biased. Many of the published documents were authored by state and local officials (including peasant self-administration officials), landowners and tenants, obviously not sympathetic to peasant actions or revolutionary ideas and appalled by the violent infringements on private property and social order. For example, a memo of a procurator official Grigory Kovalenskii (to be widely used below)—an all-encompassing and balanced account of the events and the analysis of their causes—was fully published in the 1923 volume.[6]

Comparative case study. In addition to the qualitative description of events available in the published archival documents, I undertake a within-case study, using contemporaneous district-level statistics for the Poltava province available in Svavitskii and Svavitskaya 1926 and various Poltava *zemstvo*[7] publications. The design of this study can be characterized as a version of Mill's Method of Difference (or "most-similar research

[6] At that time the Bolshevik regime published documents of the Tsarist government and memoirs of its officials without much censorship in order to expose the vices of the Tsarist regime.

[7] All-estate province- and district-level elected self-government bodies were first introduced in some of the provinces in 1864. *Zemstvos* collected their own taxes, and were responsible for the provision of public goods and promoting improved agricultural techniques. They collected a lot of economic, social, and demographic statistics concerning the local peasantry and the state of agriculture.

design"; see Gerring 2017, pp. 79–83): I compare values of a set of indicators for Poltava districts and see with respect to which indicators the districts affected by the uprising are distinguishable from the rest.

Application of this method faces known problems (Gerring 2017, pp. 142–143). Ideally we would like to have cases differing in their outcomes, but identical in the values of other variables, except for one, which might be considered the causal factor. In practice, it is hard to find cases fully meeting these criteria: they can differ with respect to several potential causes, and even with the expansion of the number of cases and proceeding to a large-N study, "there are bound to be doubts about whether all the relevant background conditions are correctly identified, measured, and controlled" (Gerring 2017, p. 143).

I argue that it is still pertinent for my purposes because it has allowed me to establish a proximate set of potential causes, which is vital at early research stages. I also try to explore a wide set of indicators to account for any imaginable factors. The choice of the sample is stipulated by data availability and comparability. Much of the information, as I have mentioned above, was collected by local *zemstvos*, and their practices of information collection and publication differed a lot across provinces. My focus on the fifteen districts of the Poltava province, where the unrest originated, is also advantageous because there is data from repeated censuses allowing comparison across time.

3.3 Poltava-Kharkov Uprising: A Document-Based Study

3.3.1 Exposition

The area of the disturbances was located within the black-soil (*chernozem*) region, a part of the fertile soil belt stretching throughout the southern part of the European Russian

Empire, and was partly bounded by strips of poorer soils in the vicinity of the provincial capitals Poltava and Kharkov (Figure 3.1).

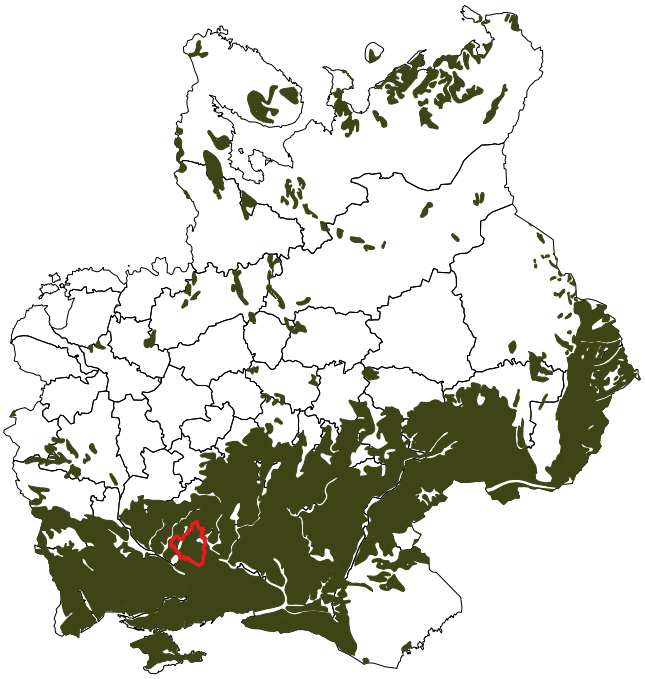

Figure 3.1: Distribution of fertile soil in the European part of the Russian Empire (dark green) and the area of the 1902 peasant uprising (red). Following Brady and Weil 2002, as cited in Dower et al. 2018, fertile soils include chernozem, greyzem, histosol, kastanozem, phaeozem, and vertisol. The soil type names are given in accordance with the World Reference Base for Soil Resources, a classification used by FAO. Soil type data source: Digital Soil Map of the World, https://worldmap.harvard.edu/data/geonode:DSMW_RdY.

Although there is evidence of the activities of revolutionary parties, organizations and individuals, the movement did not explicitly pursue political purposes and was directed against large landowners and tenants. The peasants looted their estates and staked claims to their land. About 105 large farmsteads (*economiias*)[8] of the Poltava

[8]According to the Ushakov dictionary, *ekonomiia* meant a "large capitalist estate, equipped and supplied by everything necessary for conducting organized farming" (https://ushakovdictionary.ru/word.php?wordid=87180). *Ekonomiias* typically employed hired labor and used agricultural machinery. Large

and Kharkov provinces were subjected to destruction and looting, 38 of them in the Konstantinograd district, and 41 in the Poltava district (Sliusarskii 1961, p. XVIII).

The epicenter of unrest and the place where it originated, was a large estate named Karlovka, owned by the Dukes Georgii and Mikhail Meklenburg-Strelitskiie and Princess Yelena Saksen-Al'tenburgskaya. According to the 1905 data, this estate occupied 56,748 *desyatin*, that is, more than 153,000 acres [9] of land, which constituted more than one tenth of the total amount of land in the district (549,831 *desyatina*, or about 1.5 mln acres) and about 16% of the privately owned land (with 3,063 private landholdings total)[10]. It was not only by far the largest estate in both the Poltava and Kharkov provinces, but was among the largest estates in the whole European Russian Empire (at the turn of the XX century, the largest estate was in the Kiev province and occupied about 96,967 *desyatiny*, or 261,811 acres) (see MZGI Department of Agriculture 1901, p. IV.).

According to the 1901 description (MZGI Department of Agriculture 1901, p. 435–437.), the estate had 58,015 *desyatin* (156,641 acres), more than one third of which was arable land. The estate was divided between 13 separate farm administrations (*upravitel'stva*) and several *khutors*[11]. The estate practiced quite advanced eight-field farming[12], and had several industrial establishments: a starch factory, a distillery, an oil mill, a steam mill, and a mechanical workshop. A railroad station of the Khar'kov-Nikolaev railroad was located in the territory of estate. It also maintained a female vocational

estates (*imeniia*), similar to the one discussed below, could be subdivided into several *ekonomiias* or *upravitel'stva* (farm administrations) with their own managers (*upravlyayushchiye*). Following Miller 2013, I translate *ekonomiia* as "farmstead", which makes sense given that at the time *ekonomiia* denoted not the land parcel itself (traditionally described by the word *imeniie*), but the economic activities performed on it, that is, plown and sown land, gardens, buildings, and productive facilities (Kuznetsov 2018, p. 17).

[9] 1 *desyatina* = 1.09 ha = 2.7 acres.

[10] Tsentralnyi statisticheskii komitet MVD 1907, pp. 18, 10. Although this publication does not list individual estates, it provides summary statistics within landholding size brackets. It is possible to identify this estate because it was the only one falling within the >10,000 *desyatin* category

[11] A land plot with a homestead.

[12] An advanced system of crop rotation dividing the land into eight fields. Many peasants still practiced the less efficient three-field system, known since medieval times.

school (*uchilishche*) and sponsored 14 primary schools attended by the descendants of former serfs.

In 1861 the Karlovka estate, then owned by the Great Duchess Yelena Pavlovna, had a slightly lower size, 53,941 desyatina (145,641 acres), and 7,392 male serfs, but most of the land, 32,149 *desyatin* (86,802 acres), was in the peasants' usage (Redaktsionnye Komissii 1860, pp. 18, 19). In a strange irony, Yelena Pavlovna's early (1856) project of freeing Karlovka peasants with state-assisted land redemption served as a prototype of the final version of Emancipation reform (Moon 1999, pp. 58–59), which aimed to satisfy and pacify peasants, but failed to do so, even in Karlovka itself. By the turn of the 20th century, villages adjacent to this estate became centers of growing discontent, of which Karlovka's farmsteads became the first victims.

A closer look at the geographic location of unrest (Figure 3.2) can shed some light on a constellation of contingent and structural factors which led to the movement and determined its spatial patterns. Red crosses designate known sites of unrest for which it was possible to determine precise locations. These are the villages where dwellers took part in the disturbances in March–April 1902, or where there were reports of robbery or destruction of farms belonging to tenants or private owners and industrial establishments in the immediate vicinity. The vector data on post roads, taken from "The Imperiia Project,"[13] relate to the year 1837. Unfortunately, I have been unable to find road GIS data for a later period, but it might be reasonable to assume that the location of the main roads would not have undergone considerable changes by the turn of the 20th century.[14]

[13]See O'Neill 2016*a*, O'Neill 2016*b*, and O'Neill 2016*c*.

[14]For the sake of simplicity the map does not depict the hierarchy of roads, which consisted of main (imperial), provincial and district roads.

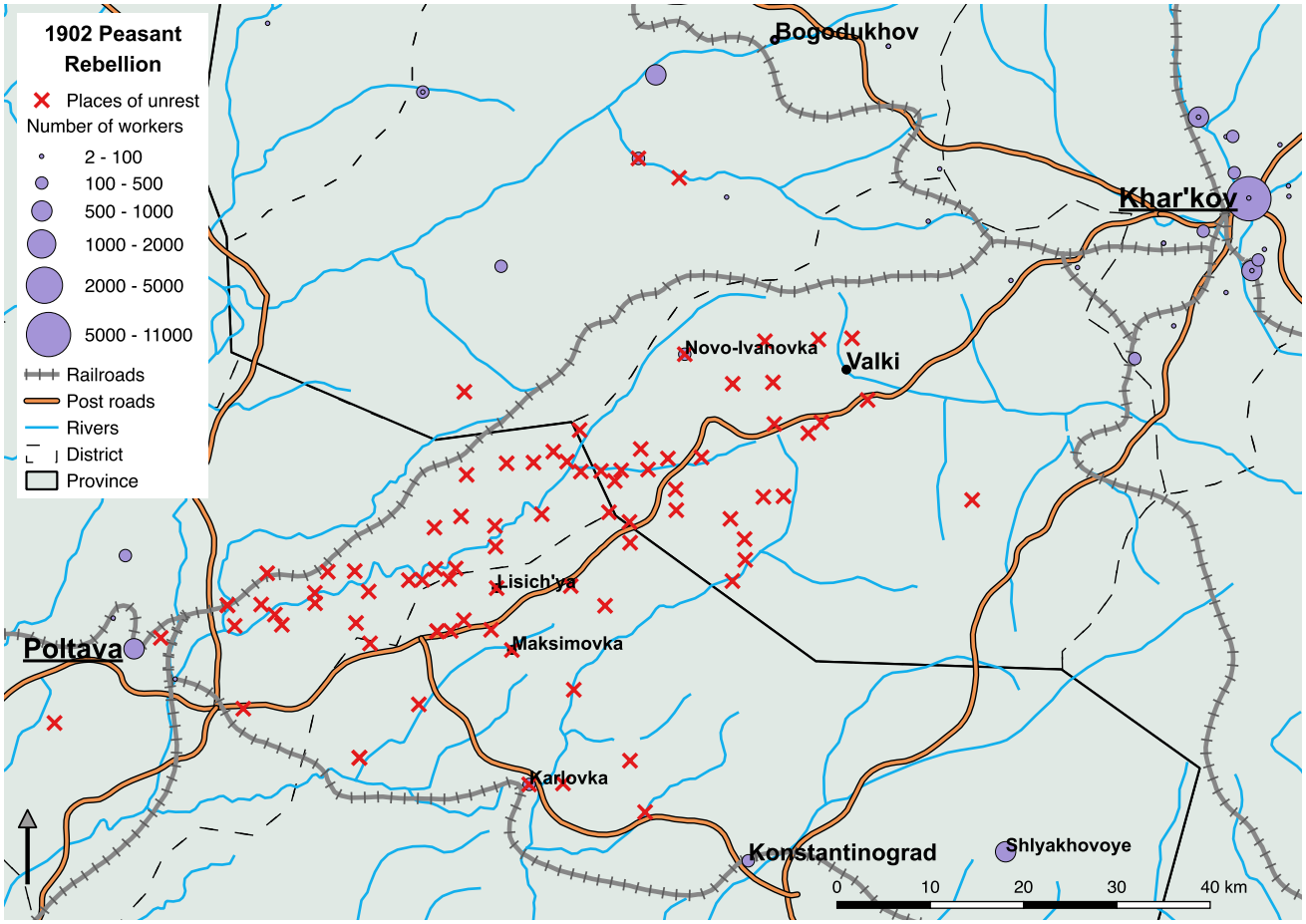

Figure 3.2: 1902 uprising in the Poltava and Kharkov provinces. The map shows names of selected settlements and district and provincial (underlined) capitals. Province borders are thick solid lines, district borders are thin dashed lines. Sources: Anfimov 1998, GIS data described in Table 4.3.

Strikingly, the unrest was mostly localized in the area crossed over by major transportation routes connecting Poltava and Kharkov and neighboring territories. Originating in the areas near the villages Lisich'ya and Maksimovka (labeled on the map) and a nearby railway station Kochubeevka (Veselovskii 1923, p. 28), it spread in both directions towards the two provincial centers along the main post road, the railroad, and to a large extent the rivers by which the settlements were traditionally placed. It stopped short of Poltava, but failed to reach the Kharkov district. The authorities were particularly concerned that rebellious peasants could make their way to industrial centers in the Kharkov province, which did not happen (Sliusarskii 1961, p. 71).

Another important observation is that although by all accounts Konstantinograd villages played a crucial role in the beginning and spread of disturbances, most of the known unrest locations seemed to be concentrated in the Poltava and Kharkov districts. Important routes of communication between the two provincial capitals lying within the reach of the initiators of disturbances provided a better avenue for the movement than the intra-district networks.

3.3.2 The Course of Events

The available documentary evidence does not allow me to establish the exact starting date of the uprising. The attacks of the peasants on Karlovka farmstead are relatively well documented from March 20–21, 1902 (e.g. Sliusarskii 1961, p. 126), although it is possible that there was an earlier starting date, e.g. March 12 (Sliusarskii 1961, p. XVII), or even March 9, after which "there began systematic theft of potatoes and hay in the Karlovka farmstead" (Veselovskii 1923, p. 65).

As numerous accounts demonstrate, the uprising was probably not spontaneous: "two or three months before the beginning of disturbances local [land]owners and ten-

ants started to notice" a certain "fermentation" (*brozheniie*) among the peasants: discussion of books and newspapers "of criminal content," expectations of new laws and property redistribution, "defiant" [*vyzyvayushcheye*] and "insolent" [*derzkoye*] behavior of the peasants (Veselovskii 1923, pp. 64–65). The period since early March was marked by anonymous threats to some landowners, and a number of "ominous fires" of property (Veselovskii 1923, p.65).

The peasants did not turn to violence all of a sudden: verbal expression of discontent with their plight tended to come first. As a general rule, in the course of this movement the peasants actually showed substantial timidity and caution in their encroachments on estate property in order to avoid punishment. Often inspired by more or less reliable news about successful disturbances in other places, they went to nearby farmsteads asking estate administrators and owners for food and forage assistance (in some cases in excess of what was routinely provided), and if their requests were not satisfied, they sometimes proceeded to steal and rob (Sliusarskii 1961, p. 125; Veselovskii 1923, p. 52).

A fairly detailed record of events is available after March 20; from then on multiple incursions on the farmsteads of Karlovka estate had been registered (e. g. Sliusarskii 1961, pp. 82–83). Informative testimony by a village elder, I.A. Gaiduk, concerning plundering of Karlovka's Varvarovka farmstead by Maksimovka peasants sheds some light on the origins of the uprising. It creates an impression that the events began quite spontaneously, without any prior organizational effort, and were likely triggered by a local potato harvest failure and ensuing peasants' claims for food assistance. It also documents the persistence of norms and practices involving landlords' provision of peasants' subsistence in bad years (reminiscent of Scott 1977).

> The looting began in the following way, at least in Maksimovka, as far as I know, as a result of the potato harvest failure, the price of the latter considerably rose, and in Karlovskaya farmstead, rumors had it, potatoes were

> sold at 10 kopecks per *pud*.[15] I came into Varvarovskoye farm administration (*upravitel'stvo*) with a *desyatskii*[16] to check on this rumor.
>
> The manager (*upravlyaiushchii*) confirmed it and said that the poorest members of my *society*[17] will receive 3 measures of potato per person free of charge. At first, there gathered about 8 of us, we were given [potatoes], we were followed by others, and so on. The farm administration was giving out [potatoes] until it could, and then, because there were more and more needy people, they began to take it without permission, that is, "plunder".
>
> The rumor that we were given [potatoes] free of charge, quickly spread across all the villages, and everyone set off with the idea that one could go take [potatoes]. After Varvarovskoye [farm administration] they began to take from Burtovskoye [farm administration], not potatoes, but hay, and in this case it turned out that the demand for hay was strong. Especially when the spring work began. The problem was that Maksimovka inhabitants first bought a stack of hay, and when they came to take it, there was not enough hay for the people who wanted it, and therefore they took without permission a second stack of hay. The others learned about that and decided that you could take hay, and themselves proceeded [with that]. And the further it went the more the people became seized with the passion to take advantage of, to grab at least something. At that time they forgot that it was not theirs, that you should not take it, that punishment would follow. Everyone was kind of excited, blindly trusted the rumors (*verily slukham na slovo*). And the robbery moved from potatoes to bread and to everything that the hand could grab (*vsyo chto popadalos' pod ruku*); it was hard to keep people in check, they did not listen and grabbed everything that they had a chance to grab (Sliusarskii 1961, p. 158).

The movement was expanding, and initially small groups of peasants became increasingly organized and were joined by peasants from other villages and parishes. "Quite openly, on hundreds of carts, they came to farmsteads, opened barns, warehouses, and took out grain, potatoes, forage, agricultural tools, and led out the cattle" (Sliusarskii 1961, p. XVII).

Since March 31 the wave of plundering spread to the Valki and Bogodukhov districts of the Kharkov province (Sliusarskii 1961, pp. 95–105). "The crowds of 300, 400, 500,

[15] *Pud* was a Russian measure of weight approximately equal to 16 kg.
[16] The lowest-rank police officer elected from among the local peasants.
[17] See footnote 2.

and sometimes more peasants, partly local, partly coming from nearby villages of the Poltava provinces, began to appear in landlords' estates" (Sliusarskii 1961, p. 31). They required keys from barns and other storage areas, and if refused, just broke open the doors and took grain, flour or other goods, and even promised that later they would come for the cattle. The peasants justified their actions stating that

> ...now "such rights have been released", that in this way "it is written in the sheets of paper,"[18] that they "now own all the land and everything that grows on the land", and that "it's enough to the masters to master" (*dovol'no panam panovat'*) (Sliusarskii 1961, p. 33).

Among other things, the peasants looted a creamery belonging to a land captain in the Valki district. They stole "machine belts and various machine parts which were easy to break off and carry away" (Sliusarskii 1961, p. 33). On April 2 the disturbances reached the district capital Valki, into which arrived crowds of peasants.

The troops commanded by the Kharkov governor Obolenskii managed to intercept some of the looters and avert a number of robberies. Some of the peasants, fearing imminent punishment, started to return the loot. "Due to the impossibility of arresting all the culprits, the governor gave an order to immediately subject them to corporal punishment, write down their names and then release" (Sliusarskii 1961, p. 34).

Obolenskii's report to the Minister of Interior contains vivid details on the plundering of Moldavskii's sugar refinery in Novo-Ivanovka on April 1. As the governor with the troops advanced towards *sloboda* Kolomak, near which the refinery was located, they observed more and more "carts with sugar and carts loaded to the top with household appliances, metalwork, rods, brass pipes, wooden boards, etc. Some of these things, especially the most bulky ones, were thrown on the road; in many places there were piles of spilled granulated sugar" (Sliusarskii 1961, p. 69). The governor's detachment

[18] "...tak i v "listkakh napisano"", that is, written in illegal leaflets.

managed to catch and punish some of the looters. According to the governor's account,

> ...the looters (*grabiteli*) did not spare even the patients in the factory hospital, pulling out the mattresses from beneath them; the factory drugstore is also ravaged. *What the looters could not take with them, namely, machines and, in general, more or less bulky things, was destroyed or put into disrepair*. Up to 150 pairs of oxen, one hundred horses and plenty of small livestock were stolen [the italics are mine - D. K.] (Sliusarskii 1961, p. 69).

These quotes demonstrate the level of ferocity displayed by the participants of disturbances, but they also serve as an evidence that the peasants' attack on the factories was not just plain looting, but also aimed at the full cessation of factory activities.

The advancing troops, resorting to arrests and punishments, managed to quell disturbances, stop or prevent looting and make the peasants return the loot. Still, the disturbances continued and spread to the Bogodukhov district. On April 3, the police bailiff with a hundred of Cossacks averted the looting of the Konstantinov sugar refinery which had been agreed on by the peasants of surrounding villages, who had already started to arrive. At that point the main aim of the local authorities was to prevent the mob of looters, which advanced to the north, from reaching the industrial region mostly located in the Sumy district, which could fall under its destabilizing influence (Sliusarskii 1961, p. 71).

Meanwhile, the disturbances were unfolding in the Poltava province. The culmination occurred on April 1 near *selo* Kovalevka in the Poltava district, where the troops intervened in order to stop the plundering of the farmstead and the grain mill (the peasants were stealing potatoes, flour, piglets and hay), and opened fire on the peasant crowd resisting the soldiers, which killed three and wounded seven peasants, one of whom later died in a hospital (Sliusarskii 1961 , pp. 44 - 48, 89).

By official reports, the uprising was mostly suppressed by April 2–3, with some episodes registered as late as April 5 (Sliusarskii 1961 , p. 53). The initial reaction of the

provincial administration was somewhat slow, and during the early weeks they seemed to overlook an upsurge in theft, plundering and general discontent of the Konstantinograd peasantry. According to an exculpatory report of the Poltava governor Aleksandr Bel'gard, although the first known case of plunder took place on March 20, it was reported to the district police officer (*ispravnik*) only on March 25, and reached the governor only on March 28, when the movement started to expand beyond the Karlovka estate (Sliusarskii 1961, p. 83), although another source says that the governor was warned of the impending attacks on estates and threats to tenants and landowners "long before" the disturbances started (Veselovskii 1923, p. 65), possibly as early as March 23 (Veselovskii 1923, p. 25).

Only in the morning of March 30 did Governor Bel'gard set off for Karlovka at the head of three infantry battalions (but not the more mobile cavalry, Sliusarskii 1961, p. 85; Veselovskii 1923, p. 25), and he arrived there the evening of the same day. After March 31, his troops carried out executions in the rebellious villages of Maksimovka, Lisich'ya and other settlements. By that time, however, the disturbances had spread not only to the Poltava district, but also to the Kharkov province, where they were intercepted by governor Obolenskii's troops, but not before wreaking much havoc. Bel'gard reportedly did not even care about placing sentries in the villages he passed, which partly explains his initial failure to localize the disturbances (Veselovskii 1923, pp. 19, 25). The Kharkov prosecutor in an early report to the Minister of Justice even went as far as to state that "one must acknowledge that in the Poltava province violence and plundering was not suppressed by the authorities, but was ceased by the plunderers themselves" (Veselovskii 1923, p. 25).

Overall, after military force was deployed, distributed across villages and engaged in mass arrests and executions, the movement was terminated in the course of several days. In some cases self-organized local townspeople assisted the authorities in the pre-

vention and suppression of disturbances. For example, in the town Valki of the Kharkov province a local butcher along with his friends blocked off the town entry and detained all "suspicious" individuals (Veselovskii 1923, p. 109). There were complaints of arbitrary and indiscriminate corporal punishment, which continued even after the end of the disturbances; the identification of the guilty depended on the will of those landowners, tenants and estate managers who incurred damage, which created the grounds for abuse (Veselovskii 1923, p. 110).

For all the excesses, some sources emphasize that such severe acts as attacks and destruction of private houses and stealing of cattle were relatively rare. Poltava governor Bel'gard noted that only one estate in his province suffered from them (Sliusarskii 1961, p. 90). Another such case was registered in the Valki district of the Kharkov province when not only the barns, but also the private house of the landlord Gayevskaya was plundered, while the barns and the manager and servants' houses were burnt down (Sliusarskii 1961, pp. 33–34). There were a number of cases of arson (e.g. Sliusarskii 1961, p. 52), episodes of beating and violent clashes with troops, however, they were relatively unusual. Arson and plundering of the landlords' estates, in particular living houses, which became widespread during the 1905–1907 mass movement, was still exceptional.

3.3.3 The Aftermath of Uprising

The immediate response to stop the disturbances was quite harsh, but in the later treatment of the participants the authorities decided not to push too far with punitive measures. In order to compensate for the losses caused by the disturbances, a Tsar's decree was published that authorized the issuance of a treasury loan of 800,000 rubles (about half of the total estimated damage of 1.5 mln rubles). The peasant communes (*sel'skiie*

obshchestva) which participated in the uprising were made liable for the repayment of this loan (Sliusarskii 1961, pp. 175–178). The authorities, true to the principles of regular taxation of the peasantry, preferred to impose collective responsibility on the communes rather than exact the damage compensation directly from the individuals that had been found guilty. However, this measure turned out to be short-lived: the Manifesto of August 11, 1904, issued on the occasion of the birth of Tsesarevich Alexei, canceled this "indemnity" along with forgiveness of other tax arrears, and it is unclear how much of it had been collected by that time (Veselovskii 1923, p. 13).

According to the documents, in total 960 people were tried in court, 123 of them were acquitted, the rest were initially sentenced to different prison terms, mostly for several months, however, with respect to 750 of them, the Kiev and Kharkov court chambers asked for mitigation of punishment, which was granted in most of the cases (Sliusarskii 1961, pp. 230–231; Veselovskii 1923, pp. 116–120).

Kharkov governor Obolenskii, known for his "energetic" measures against the rebellious peasants, was promoted by the Minister of Interior and later became the General-governor of Finland and an Adjutant general (Witte 1922, Ch. 16, p. 185). Conversely, Poltava governor Bel'gard's "irresolution" and "inaction" cost him his career: soon he had to resign as governor, was "attached" to the Ministry of Interior, and then retired in 1905.

The events in Poltava and Kharkov had repercussions in neighboring districts and provinces. Some "fermentation" (*brozheniie*) was noticed in the Lubenskii and Lokhvitskii districts of the Poltava province (Sliusarskii 1961, p. 235), and also one estate was attacked in the Volchansk district of the Kharkov province. Local authorities, concerned by changes in the peasants' mood and the appearance of propaganda materials, sent reports to the Saint Petersburg. The rumors of imminent private land seizures and redistribution were heard in the Yekaterinoslav province, which led to the intervention of

troops (Sliusarskii 1961, pp. 238–240). Disturbances probably inspired by the Poltava-Kharkov movement were also registered in the Chernigov and Kharkov provinces.

While visiting Kursk on September 1, 1902, Nicolas II addressed the audience consisting of selected parish and village elders from the Kursk, Poltava, Kharkov, Chernigov, Oryol and Voronezh provinces with the following speech:

> This spring in some areas of the Poltava and Kharkov provinces the peasants plundered neighboring farmsteads. The culprits will be subjected to deserved punishment, whereas the authorities will be able, I am sure, to prevent similar disturbances in the future. I remind you of the words of my deceased Father, which he said in Moscow to parish elders in the days of the sacred Coronation: "Obey your nobility marshals and don't believe absurd rumors". Remember that people get rich not by seizing another's possessions, but by honest labor, frugality, and living according to God's commandments. Tell everything that I told you exactly to your fellow villagers and also tell them that I will not neglect their real needs (Pravitel'stvennyi Vestnik 1902, No. 192, Tuesday, September 3, p. 1).

Many of the problems that might have provoked the 1902 uprising (discussed in the next section) remained unresolved, and tensions persisted. The movement in Karlovka resumed in late November 1905. According to a report of the chief factory inspector in the Poltava province to the industrial department of the Ministry of Finance, the peasants' aim was to make non-peasants abandon any economic activities on the land of the Karlovka farmstead. The mostly peasant crowd first came to the alcohol refinery (*vinokurennyi zavod*) and demanded all the workers leave the factory. The factory management had to stop the factory activities, in particular the work of the factory machines. In the same fashion the peasants caused the full stoppage of the sugar refinery,[19] the mechanical workshop, the starch factory, and the steam flour mill. Peasants from other settlements of the Konstantinograd district were removing (mostly agricultural) workers from work in farmsteads (Los', Oleinik and Sheludchenko 1955, pp. 715–718.).

[19]Which, according to MZGI Department of Agriculture 1901 , pp. 435–437, had already been planned in 1901, and finally built in 1905.

3.3.4 The Causes of Uprising: Documentary Evidence

The events preceding the uprising and the plausible causes of peasant discontent can be reconstructed from the officials' reports and witness testimonies. A particularly insightful and informative document, providing a comprehensive analysis of the uprising, is an extensive memo authored by Grigorii Ivanovich Kovalenskii, at the time an acting deputy of the Ober-Procurator in the 2nd department of the Senate (Veselovskii 1923, pp. 64–113). Without belittling the complexity of the situation, it might be stated that the economic hardships of the peasantry are a leitmotif of most of the accounts, which feature it as the fundamental cause of disturbances. The mismatch between the rapid economic development and uneasiness of those left behind is aptly summarized by Kovalenskii:

> The fact that our Motherland has undergone an unprecedented economic transformation (*pereustroistvo*), is not a secret to anybody...
>
> We even... managed in recent years, among other things, to create a metallurgical industry that cost us almost one hundred million [rubles], and even managed to bankrupt it.[20]
>
> We have done a lot of things, indeed a lot of things, but hurrying to live, we have completely forgotten to look into our own one-hundred-million peasant mass, to ask it how it all is reflected in its life, is it strong enough to resist this temptation. Do peasant living conditions protected by us correspond to that strain of material and moral force which is required from them for the performance of such a gigantic task? (Veselovskii 1923, p. 74)

Economic position of the peasantry. Numerous documents provide vivid descriptions of strained relationships between peasants, on the one hand, and large landlords with their tenants, on the other. For example, excerpts from an interrogation transcript of

[20]This is a reference to the economic crisis that hit Europe, the United States, Japan, Russia and other countries around 1900. The Russian metallurgical industry experienced a serious slump in output and prices in 1901–1903, which was preceded by a rapid expansion partly stimulated by the state-sponsored building of the Trans-Siberian and Manchurian railroads (see e.g. Strumulin 1966, pp. 446–450).

a peasant witness help explain the causes of the destruction and looting of the farm owned by the merchant Rogovskii at the hands of the peasants living in the nearby village Smorodshchina (Sliusarskii 1961, pp. 66–67). According to his testimony, due to the population growth after emancipation, land allotment per male soul in Smorodshchina had no more than 1/4 *desyatiny*, while during emancipation they received 3 1/8 *desyatiny* per *revizskaya* soul.[21] The lack of land made the peasants dependent on a local landowner Rogovskii, who preferred to directly manage his farm, and was reluctant to rent it out to peasants. He was involved in constant litigation with the peasants concerning usage and access to his land, treated hired workers poorly, declined to provide food aid in that spring, and even managed to outbid the peasants intending to acquire the land of a neighboring landowner.

The report of A.V. Gerasimov, a deputy head of the Kharkov province gendarmerie (Sliusarskii 1961, pp. 151–157), contains a detailed description of the economic situation. This report stresses the remarkable success of the anti-government propaganda in the Konstantinograd and Poltava districts, but focuses on the poor economic situation of the local peasantry, which contributed to mass discontent. Gerasimov emphasized that the area had a large share of the "rural proletariat" particularly sensitive to demands for land redistribution. Their living conditions notably worsened by the spring of 1902 due to preceding harvest failures. His observations, confirming the lack of outside options for the peasants and a growing land shortage, are particularly important from a theoretical point of view:

> In general, the economic dimension of the peasants' life in the area under consideration is under the influence of permanent factors such as the absence of ancillary occupations, such as handicrafts, and relatively weak develop-

[21] *Revizskaya* souls are the male population enumerated during the last, Xth *reviziia*, a tax census conducted in 1857–1859. Endowment of peasants with allotment land during emancipation was based on its results, and the number of *revizskaya* souls was used as a point of reference in the following decades.

> ment of migrant work (*otkhozhiie promysly*), as well as the complete absence of factory and plant industry (*fabrichnaya and zavodskaya promyshlennost*)...
>
> In many *sela* and villages of the Konstantinograd and Poltava districts the peasants either do not have land at all, or have an insignificant amount of it—1 *desyatina*, 1/2 and even less per each household (*dvor*). This deplorable situation did not emerge all of a sudden, not recently, but had been prepared gradually, starting in 1861, since the emancipation of the peasants from the serfdom dependence. Most of the peasants of the region during the emancipation received the so-called [gift] allotment (*darstvennyi nadel*) of 1/4 *desyatiny*[22] (*sela* and villages: Maksimovka, Ladyzhen', Rubanovka, Davydovka, Pas'kovka, Leventsovka and others).
>
> As a result of the growth of families and land partitions inevitable in peasant life, the land that was received by a given family in 1861, in the present time, after 41 years, belongs to numerous descendants of the forefather, who received the allotment of 4 *desyatiny* in the year of emancipation, and these descendants mostly own only 1/2–1/3 *desyatiny* per household. There is no doubt that even under the richest harvests, industriousness of the tiller and his minimal needs, 1/2–1/3 *desyatiny* are far from being sufficient for the laborer and his family to be well fed (Sliusarskii 1961, pp. 152–153).

Gerasimov lamented the exploitation of landless peasants by large tenants, who were held in greater disrepute by peasants and observers of peasant life even than the landlords themselves. Taking advantage of the masses of landless peasants almost fully depending on farming for their livelihood, large tenants, coming from the ranks of the richer peasantry, cossacks, town dwellers (*meshchane*) and retired soldiers, emerged as the main holders of the landlords' land to which the peasants now had more limited access on quite burdensome sublease terms. In the region under consideration it was quite a widespread practice for landlords and tenants to require work on their fields in return for leasing land (*otrabotki*). It considerably constrained peasants' ability to work on their plots given that they were obliged to give priority to landlord or tenant land (Sliusarskii 1961, pp. 153–154).

[22]During the emancipation the peasants, instead of getting the full allotment (*nadel*), had the right of receiving *darstvennyi nadel* equal to 1/4 of the maximum *nadel* in that area without redemption. This option initially seemed attractive if the redemption sum far exceeded the current market value, but could lay ground for later conflicts (Sliusarskii 1961, p. 152; Zaionchkovskii 1960, pp. 233–236).

Differentials in the monetary rate at which the land was leased out to the large tenants and then subleased to the peasants are particularly telling. The tenants were able to secure a much lower price (probably because of renting relatively large amounts of land and providing stable monetary income to the landlords). It was 6 rubles versus 12–15–18 rubles per *desyatina* in Maksimovka, where all the land surrounding the village was rented by a tenant, and 5–6 rubles vs 10–15 rubles in Lisich'ya. Similar sublease rates were prevalent in Poltava districts. *Otrabotki* could require cultivation of 2–3 *desyatiny* of the landlord or tenant land in exchange for 1 *desyatina*, and 6–7 *desyatin* in exchange for 3 *desyatiny* (Sliusarskii 1961, p .154).

The above-mentioned village elder Ivan Gaiduk also complained about worsening conditions of land rent and low wages for agricultural work, which became unbearable in times of harvest failures during the years preceding the movement. Notably, migration was not an option because of impoverishment: for resettlement a family needed to have 300–500 rubles and enough adult members, which was prohibitively high for the majority (pp. 158–159).

The text of the sentence of the Kovalevka peasants who took part in plundering and instigating of the disturbances made by the Kievan court contains a description of the economic hardships experienced by the peasants:

> ...Plundering (*raskhishchenie*) of Trepke farmstead took place as a result of economic relations between the peasants and local farmers [sic!].[23] Local peasants, with a few exceptions, belong to the land-poor and poor category; their allotment is two *desyatiny* per soul; they have nothing to feed their livestock with, and some of the peasants of *s.* [*selo*] Kovalevka have no land at all, as a result of which, having a need in arable land, hayfields and pastures, they rent land for money or labor on extremely harsh terms: thus, for the rent of one *desyatina* of arable land, they pay 15–18 rub., for the rent of a meadow 15–25 rub.; to be able to rent one *desyatina* of arable land, the peasant has to reap 3 *desyatiny* of the farmstead land, and the leaseholder has to get to work

[23] *Zemledel'tsy* in text. Probably this is a typo: must be *zemlevladel'tsy*, landowners.

> on the latter immediately at the first request of the farmstead.
>
> Such difficult economic living conditions of the peasants provoked their irritation (*razdrazheniie*) against local landowners, of whom they were economically dependent. To this was added the influence of rumors on the necessity of an increase in the peasants' allotments, and also about the necessity of distribution among the peasants of the landlord land, and about Grand Duke Mikhail distributing the land, spread by means of proclamations and forbidden books. Then the 1901 harvest failure enhanced the peasants' destitution (*nuzhda*) and facilitated the proliferation of belief in the credibility of the aforementioned rumors; all the more, the looting of the farmstead in the vicinity of *s.* Kovalevka, continuing in the end of March, proceeded unpunished and served as a contagious example for the ignorant peasant mass (Sliusarskii 1961, p. 204).

In addition to the evidence of worsening land rent conditions caused by a greater reliance of the landlords on large-scale tenants and the lack of outside options for the peasantry, there are more specific indications of the effect of the growing industry. In particular, in the opinion of the Valki district land captain (*zemskii nachal'nik*) Glushkov, "with the building within the territory of the Valki and Bogodukhov districts of two sugar factories, the area of the land leased out to the peasants narrowed down considerably, and the land rent prices went up" (Veselovskii 1923, p. 76). Notably, both of them were targeted by the peasants. As described above, the newly built Novo-Ivanovka sugar refinery in the Valki district (established in 1901)[24] was subjected to the most severe plundering. The second sugar refinery meant by Glushkov, that is, Konstantinov, or Pavlo-Olginsk factory in the Bogodukhov district, the looting of which was prevented by the police and Cossacks, had been built earlier—in 1884, that is, its influence on land rent prices could have been felt earlier.[25]

Kovalenskii also names another possible channel through which industrialization could stir unrest: the peasants could fall under the influence of disgruntled workers who lost their jobs and had to return to the countryside due to the economic recession

[24] Yezioranskii 1909, No. 7017.
[25] Yezioranskii 1909, No. 7019

of the early 1900s (Veselovskii 1923, p. 99).

Propaganda and the origins of unrest. Judging by the first police reports, the first instinctive move of the local officials was to explain the disturbances by successful propaganda. Agitation, dissemination of leaflets and pamphlets did take place a couple of months before and during the events and could have been an important factor. There were two main sources of the anti-landlord and anti-regime propaganda: illegal parties, organizations, and hotbeds of resentment within the peasant communes, which themselves tended to emerge under external influence. In an early report Aleksei Aleksandrovich Lopukhin, the prosecutor of the Kharkov court chamber, noted that the unrest events could have been a result of "revolutionary propaganda" led by the Poltava committee of the Russian Social Democratic Worker Party and a "circle of Ukrainophiles" (Veselovskii 1923, p. 20).

However, there are two important qualifications putting limits on the role of propaganda. First of all, according to official data (Veselovskii 1923, p. 22), distribution of illegal proclamations, among other things demanding peasant ownership of all the land, also took place in the districts that did not experience significant unrest. Out of the sixteen cases of detected proclamations in the Poltava province in February—March, only four took place in the Konstantinograd district (one near the border with the Poltava district). Five cases were registered in the Kremenchug district, six cases in the Priluki, Kobelyaki and Zolotonosha districts, and none of them were affected by the peasant movement. Proclamations were also found in some villages of the Lubny district, which seemed to have experienced certain repercussions of the 1902 movement. There was also information about the capture of agitators in the Valki and Bogodukhov districts of the Kharkov province and rumors of propaganda in the Poltava district (Veselovskii 1923, pp. 27–28).

Even if this information is incomplete and not quite accurate, it shows that anti-

government propaganda was relatively widespread, whereas the geographic localization of the uprising was considerably more narrow. It does not mean the propaganda of local revolutionary organizations played no role, but absent other factors, either structural or circumstantial, it alone was unable to explain the spatial patterns of unrest.

Official investigation ascribed a leading role in the spread of propaganda and instigation of disturbances to the village Lisich'ya (often mentioned along with Maksimovka, which actually seemed to rebel earlier) of the Konstantinograd district. (Veselovskii 1923, e.g. pp. 28, 53–54, 64, 68–69). According to the detailed analysis in Kovalenskii's memo (Veselovskii 1923, pp. 66–74) the peasants of Lisich'ya had previously been particularly well-behaved, and regularly paid for the land purchased with the help of the Peasant bank (Veselovskii 1923, p. 66), but then, in the course of several years preceding the 1902 events, started to weaken their ties with the landlord's farmstead. The peasants refrained from renting farmstead land, and in their private conversations they stated that they would "graze cattle wherever they wanted and take sheaves from the estate's fields". There were also rumors that the landlords' land would be given out to the peasants (Sliusarskii 1961, p. 83). According to one of the estate's tenants, in the recent years, the peasants had been undergoing noticeable "changes in their views and opinions" and treating him increasingly harshly, which made him refrain from any land-related transactions with them (Veselovskii 1923, p. 67).

The reason for such transformation of the peasants' attitudes, according to Kovalenskii's memo, was the activities of a certain Anatolii Alekseenko, who was a nephew of the Poltava mayor and a son of a local landlord owning an estate adjacent to Lisich'ya. Alekseenko, apparently having no connections with revolutionary parties and organizations, used to spend a lot of time with Lisich'ya peasants from when he was in high school, and had been an especially frequent visitor in the three years preceding the disturbances. He had been "gathering meetings of the youth, reading books to them, and

discussing something with the peasants" (Veselovskii 1923, p. 72). As a result, the villagers had organized a sort of tight-knit secret society, which in turn was spreading anti-landlord propaganda, actively participating in and promoting unrest.

On March 25th fifty peasants from Lisich'ya urged a local tenant Kolomiiets to leave the estate land: "Go away, we and our fathers have been working here. This is all ours" (Veselovskii 1923, p. 66). They threatened him and other tenants with arson; his farm was actually set on fire that night (Veselovskii 1923, p. 66). Soon a major outbreak in unrest sweeping over several districts ensued. Peasants from Lisich'ya were found traveling between villages spreading pro-redistribution and anti-tenant messages, such as "Don't be afraid. It will begin on May 1 and soon end; everyone will have 8 *desyatin* per soul" (Veselovskii 1923, p. 67). According to witness testimonies, they called for, took part in, and even organized the looting of estates. Notably, however, they specified that the property to be looted should only be "grains, food and forage" (Veselovskii 1923, p. 68, also pp. 106–107; Sliusarskii 1961 , p. 110).

For all the importance of the village Lisich'ya peasants in the organization and propagation of unrest, its role should not be overstated. Even Kovalenskii in his memo, which provides the most detailed account about Lisich'ya's role in disturbances, interprets it as a random, unexpected occurrence, which turned consequential because of deep-seated peasant attitudes, to a large extent provoked by worsening material conditions and government negligence (e.g. Veselovskii 1923, pp. 73–74, 51). Even the peasants' receptivity towards the messages of educated and urbanized outsiders like Alekseenko, which had been unseen earlier and came as an absolute surprise to authorities, itself required an explanation, and could be caused by a deep-seated discontent (Veselovskii 1923, p. 73).

This interpretation of the role of propaganda was echoed by other officials. Poltava governor Bel'gard wrote in his dispatch to the Minister of Interior that

> One cannot deny that anti-government propaganda significantly spread after the concentration in the city of Poltava and the Poltava province of a considerable number of people under [police] supervision of all categories, whose numbers had been increasing in recent times as a consequence of the disturbances which took place in higher education institutions. The number of proclamations having appeared in the meantime and penetrating in different ways into the peasant milieu, has been very significant, and many proclamations resonate with the peasants, although are interpreted almost exclusively from a socio-economic point of view. One has to acknowledge that talks about [land] redistribution, additional land allotment and others have never completely ceased among the peasants, although subsided temporarily (Sliusarskii 1961, p. 79).

The Prosecutor of the Poltava court district I. L. Tomashevskii wrote to the Ministry of Justice that "Sparks of propaganda fell on the material quite prepared for combustion and provoked a fierce movement. This movement, which originated in s. [*selo*] Lisich'ya, quickly spread out of it to adjacent parishes" (Sliusarskii 1961, p. 113).

There is also plentiful evidence of material hardships experienced by the peasants of Lisich'ya. According to the testament of a local priest Viktor Kolominskii, "the economic situation of Lisich'ya dwellers (*Lisichane*) is not particularly advantageous: now they are surrounded on all sides by tenants…, who, acting as middlemen between landowners and peasants, treat the latter less favorably" (Sliusarskii 1961, p. 124). Neighboring villages were also in a difficult situation due to bad harvests, a growing lack of allotment land and the need for rented land, which was leased out on quite unfavorable terms, including work on the landowner's fields (*otrabot*) (Sliusarskii 1961, p. 124). It is also known that in Lisich'ya and other villages, the size of the land allotment per household was 4 *desyatiny* at emancipation, but it decreased to 1 or 1.5 desyatinas by the beginning of disturbances (Sliusarskii 1961, p. VII) due to population growth. In Maksimovka the *land hunger*[26] was even more severe: in one part 657 peasants had only 28 *desyatin* in

[26]In Russian, "zemel'nyi golod"—the expression commonly used at the time to describe the lack of land in peasant usage and ownership.

total, and in another part 413 villagers held 32 *desyatiny* (Veselovskii 1923, p. 75).

The testament of a *zemstvo* schoolteacher S. I. Skripnik provides an informative description of the situation in Lisich'ya:

> Around these settlements [Maksimovka and Lisich'ya] there exist several farmsteads: Staritskii, Vodyanitskii, Karlovskii farm administrations. About four years ago there was Babanin's farmstead, which was sold in small parcels to individuals—Cossacks, each of whom started to manage his own farm. Thus, the amount of land rented out to the peasants decreased. At the same time, the tenants Vodyanitskii and Kolomiiets expanded rent paid in labor (*otrabotki zemli*), acquired agricultural machines and decreased leasing out of land to the peasants. Therefore, recently the local peasants could hardly obtain 1–2 *desyatiny* of land from the farmstead for sowing, cultivating in exchange I don't remember how much farmstead land. In the last 3 years the peasants have been feeling a particularly acute shortage of land and expressed their discontent to the tenants saying that the tenants themselves took hold of the land, and do not give any land to the peasants even at a price higher than the one they themselves pay to the owner. It led to hostile relationships between the peasants and farmsteads, mainly tenants. Meanwhile in late January of this year in the whole area there appeared books with illegal content, fomenting that dissatisfaction with their situation that started to develop among the peasants: I had a chance to hear from the peasants expression of their discontent in the following form: "Why do others have a lot of everything, while we do not have anything, our cattle stays hungry, children are hungry" (Sliusarskii 1961, pp. 124–125).

State capacity and unrest. In his comprehensive account Kovalenskii also discusses the issues concerning state capacity: he complains about the lack of connection between the authorities and the peasantry. Absentee local nobility did not care about the influence on the peasantry; understaffed police were unable to have control over a vast territory, whereas the parish administration and a handful of land captains remained passive and detached from the peasant masses; the clergy also failed to provide moral guidance for the peasants (Veselovskii 1923, pp. 84–97). As a result, the provincial authorities had only limited outreach in the countryside, and could not properly react to the rising peasant discontent and prevent the uprising. The presence of *zemstvos*, the bodies of

local all-estate self-governance at the district and province level, which were introduced in the Poltava province from the onset, did not make much difference. On a paternalistic note, Kovalenskii reports a case when a mere appearance of a single police inspector (*politseiskii nadziratel'*) proved sufficient to stop the looting in which the peasants from five villages took part. By the account of this police inspector (named Lutovinov), later, during the court trial the peasants told him they

> ...don't see the superiors at all (*sovsem ne znayut nachal'stva*), that no one visits them, instructs them, points out the falsehoods of what is going on and written in the books. The peasants asked Lutovinov not to leave them, because, if he isn't there, another gang of robbers could arrive, and they would be unable to keep themselves in check ("*togda oni za sebya ne otvechayut*', 'Veselovskii 1923, p. 91).

These problems, however, were quite typical for the Russian countryside of the period, and the districts whose populations were involved in the 1902 uprising were unlikely to be much different in that respect. Moreover, given that the uprising area was located between two provincial capitals with garrisons, and along major transportation routes, it shouldn't have belonged to the most underpoliced regions. But even there the level of state penetration was obviously quite low.

3.4 Comparative Case Study of Poltava Districts

The previous sections contain ample documentary evidence of the course of disturbances and socio-economic situation in the areas which experienced them. In order to draw a complete picture and to establish the most likely factors behind the spurt of unrest in the Konstantinograd and Poltava districts in a more rigorous fashion, it may be useful to consider quantitative measures of land distribution and land tenure practices, as well as a number of economic, social and demographic indicators to see in what

respects these two districts could differ from the rest. The Konstantinograd district, out of which came the wave of unrest, deserves particular attention. Here I show that its economic backwardness and lack of outside options available to the peasants engaged in agricultural activities, along with a relatively low proportion of land in communal as opposed to private ownership, was remarkable even in comparison to other districts, which could set the ground for a conflict.

Figure 3.3 demonstrates that while the uprising started in this district, which had a particularly low share of allotment land (the land peasants received after emancipation on communal ownership terms), it spread to the nearby districts where the peasants were somewhat better endowed with land. The region where it originated was primarily agricultural and lacking sizable industrial establishments, with the notable exception of sugar and alcohol refineries, but it closely bordered on the more industrially developed regions, in particular, Kharkov and territories to the North-West of it, such as an industrial cluster in Sumy, and, to a lesser extent, Poltava.

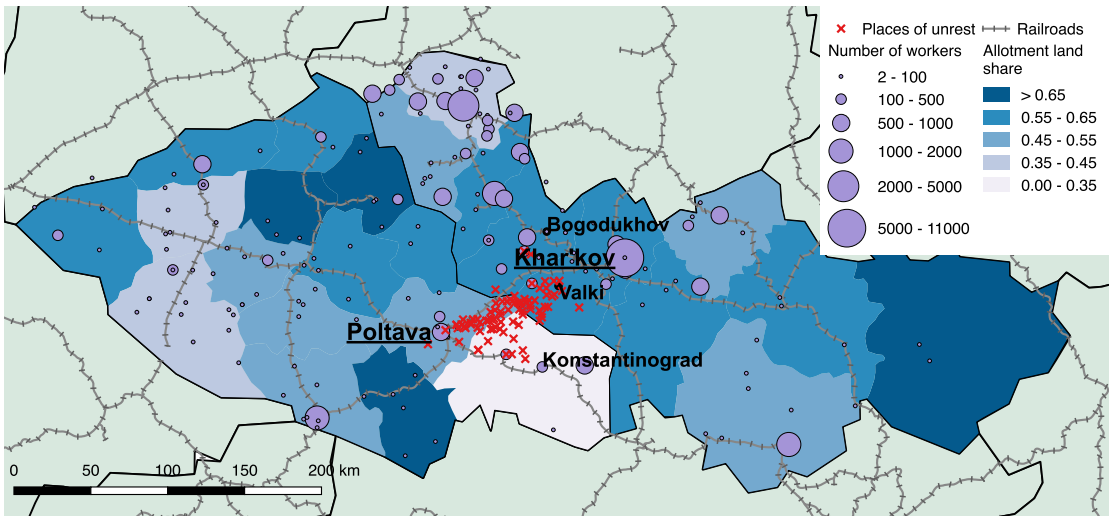

Figure 3.3: Share of allotment land (1905), location of industry (1901), and sites affected by the 1902 uprising in the Poltava and Kharkov provinces. The map shows selected district and provincial (underlined) capitals. Source: see Data Appendix

Land distribution. Examining the Tables 3.1 and 3.2 we can find a couple of structural features distinguishing these districts. A low percentage of allotment land could make peasants particularly land-constrained because the alternatives were either land purchase (too expensive for most households), land renting (increasingly costly), hired agricultural labor (often limited and seasonal) or engagement in non-agricultural activities (especially rare in the Konstantinograd district). In 1877 allotment land constituted of only 34% of total land in the Konstantinograd district, while the all-province maximum was 66%, and the second lowest share was 40%. In 1905 these indicators took the values of 36%, 40% and 58% respectively (Table 3.2). The percentage of allotment land fell in most districts between 1877 and 1905; the Konstantinograd district was among those which experienced a small increase, and its relative position even improved, but in absolute terms it still remained the most disadvantaged with respect to the allotment land share.[27]

Interestingly, in terms of per capita allotment land, Konstantinograd peasants were relatively well endowed, although the average absolute figures were much lower than the subsistence minimum by any calculation (see e.g. Tiukavkin 2001, p. 65). Due to population growth the amount of allotment land per capita considerably decreased with time; peasant land per capita was more stable because of land acquisitions, but also typically declining. The district also had one of the highest shares of black soil (*chernozem*) in total land, and a substantial share of fertile soils. The Konstantinograd and Poltava districts experienced relatively high population growth: about 22% and 25% between 1900 and the previous censuses of 1888–1889 and 1883 respectively. Given that the 1880s Konstantinograd census was conducted relatively late, its population growth relative to other districts could have been even higher.

[27]The reasons behind the changes in this indicator registered between 1877 and 1905 are not quite clear, and they are discussed in more detail in the previous chapter, but overall this indicator seems to be relatively stable.

Thus, if we judge only on the basis of per capita land endowment (considering both allotment and total peasant land) and quality, the Konstantinograd district did not seem to considerably lag behind others, and its peasants were on average no more disadvantaged than those living in other districts. My point is that given the fact that disturbances were usually directed against the possessions of private landowners, it was the private (or state)-communal land disparity that mattered most for the emergence of unrest. Communal landholding could be expanded only at the expense of privately (or state-) owned land, which had to be in place in order to become the target of peasant action. Conflicts between or within peasant communes were also present, but according to the available sources, before the Stolypin reforms launched in 1906 they rarely evolved into disturbances strong enough to appear on the radar of the authorities and did not pose a comparable threat to peace and order in the countryside. Incursions on private property often took a more violent turn and attracted a larger number of participants. They were collective endeavors, gathering people from one or several communes.

Therefore, land inequality, in particular, between large private-owned estates and peasant communes could have been more important than absolute peasant private and communal land possession. This reasoning is not identical to a "relative deprivation" argument. In practice, the amount of land owned by most peasant households, at least in the region in question, was far below the subsistence minimum, thus, the desire for land expansion was wide-spread. Large private landowners, amassing much more land than needed for individual labor and consumption, were a more natural target than neighboring peasant communes being in a similar situation.

Another important conclusion is that the form of land tenure mattered. It would be harder to explain the strength of peasant grievances without drawing distinction between the land in communal and private peasant ownership. Private and partly communal land acquisition by peasants in the Konstantinograd district between 1877 and

1905 was remarkable (share of peasant landholding rose from 36% to 66%) and arguably driven by initial land scarcity. However, even if the Konstantinograd peasants owned two thirds of all the district land by 1905, most of the privately acquired land was purchased by individual peasants or peasant "partnerships" (*tovarishchestva*).[28] As can be seen from the documentary evidence, there still remained villages which experienced particularly acute shortage of land. It might be reasonable to assume that initially poor communes also had fewer opportunities to purchase land, thus falling in a vicious cycle of poverty with growing population and fragmentation of landholdings.

The Konstantinograd peasants' need in land also manifested itself in a relatively high (second largest in the 1880s and third largest in 1900) percentage of peasant households renting land (Table 3.2). Whereas almost half of all households in the district had to resort to the rent of land of all types, only 3/5 of them rented arable land. It illustrates the point that although as a result of emancipation the peasants got most of the arable land (Table 3.2 demonstrates that a relatively small proportion of households did not have arable land), the bulk of forests and a substantial amount of meadows, indispensable for peasant farming and survival, remained in private or state hands. Therefore, much of the land either acquired or rented by the peasants after the emancipation was non-arable.

Industrialization. As I have noted above, Konstantinograd peasants did not enjoy attractive outside options. The district scored lowest among the Polatava province districts in terms of the number of households with migrant laborers, which even decreased between the late 1880s and 1900 (Table 3.2; the situation in the Poltava district was not much better). Although we do not know exactly the sectoral composition of the migrant

[28]That is, groups of peasants clubbing together to buy land. Purchase of land by the whole communes was relatively rare: in 1905 there were 83 non-allotment communal landholdings with 17413 desyatinas of land, all purchased after 1877, which was equal to 9% of the allotment land (Tsentralnyi statisticheskii komitet MVD 1907). This land had the status of *privately* owned by communes and was treated as a separate category by official statistics.

labor originating from this province, it could be evidence of the inability of Konstantinograd peasants to acquire income from non-agricultural, industrial sources. The rate of urbanization (Table 3.1) in Konstantinograd was also extremely low, and even decreased from 6% to 3% between 1879 and 1900, becoming the lowest in the Poltava province.

Figure 3.4 allows us to trace the dynamics of peasant unrest and industrialization since 1869. The blue line shows the total amount of workers per 1000 people, and the green one those located in countryside. Thus, they coincide when all the industry is rural-based, which is the case for most of the districts. We can see an overall upward trend in the Konstantinograd district; a pre-1900 increase in the number of workers was caused by the establishment of the Tsiglerovskii sugar refinery, which employed about 500 people, near *selo* Shlyakhovka (see the lower right corner of the map in Figure 3.2) in 1898. Although this happened shortly before the uprising, we can only speculate whether it could somehow affect peasant discontent in the district, especially given the fact that this part of the district did not see any disturbances. At the same time, the peasantry in the Kremenchug district, which had the most advanced urban industry (among other things specialized in machinery), remained relatively peaceful, like in a number of districts which had virtually no industry.

Output and prices. The nominal land rent prices in almost all the districts follow similar dynamics (Figure 3.5): more or less stagnating in the 1880s - mid-1890s, and beginning to rise rapidly thereafter. The Konstantinograd district stands out in two respects: first, it already experienced a rapid rise and then drop of rent rates in the first half of the 1890s; second, the starting level in the 1880s was relatively low. Fluctuations of land rent prices apparently have a lot to do with grain productivity (Table 3.6), however, a steady rise in the former indicator usually preceded a substantial grain yield growth by several years, which might have been a sign of market development.

What is also peculiar about the Konstantinograd district is a sizable and persistent

(especially since the late 1890s) gap in productivity between private and allotment land (Figure 3.6; a comparable gap can be observed only in the Khorol district). It could have happened for three major reasons: first, the large landowners could hold land of a better quality and have access to other resources, such as forests or meadows; second, large consolidated landholdings provided economies of scale; third, the employment of more advanced agricultural techniques, namely fertilizing, more sophisticated field rotation and usage of agricultural machinery, on large estates. The Karlovka estate, with its intensified agricultural production and industrial establishments processing the output and maintaining the machinery may serve as an illustration of the last point.

Table 3.6 also shows that there was no significant "crisis" of agricultural output or severe harvest failures in the years preceding the uprising, although on average the allotment land productivity in the Konstantinograd and Poltava districts were among the lowest. Most of the the time the grain yield was below or just above 50 *puds* per *desyatina* (about 872 kg per ha or 12 bushels per acre). However, despite gains in productivity by the early 1900s, which must have been at least partly caused by favorable weather conditions, there was a notable increase in rye prices starting from the late 1890s, but also universal across all the districts (Table 3.3). The reported local potato harvest failure probably facilitated the start of the disturbances, but as I have shown, underlying structural factors seemed to be no less important. Prior to the uprising, nominal agricultural wages were on the rise in almost all the districts, including Konstantinograd, and stagnated in the rest. It might have been a sign of increasing demand, however the growth of rye prices in the same period was comparable.

Summary. According to the preceding discussion, it appears that the Konstantinograd district was relatively rich in fertile soil, and its peasant population was strongly specialized in agricultural activities such that only 1–2% of families, by far the lowest share among Poltava districts, included migrant laborers. It was not remarkable with

respect to the percentage of households renting land (about a half for all types of land, and less than a third renting arable land), and was relatively well endowed with land in per capita terms, but was distinguished by a relatively low percentage (about one third) of allotment land held by communes. In contrast, by 1905 it reached the highest share of overall peasant landownership, due to the massive purchase of the land (this seems to be mostly wood and pastures) previously owned by the nobility, however most of this acquisition was to the benefit of more well-off private peasant owners (not necessarily large tenants) and partnerships rather than communes as a whole, thus, it could alleviate the peasants' need in land only to a limited extent, especially given relatively fast population growth.

The district was industrially backward like almost all the others, but a big sugar refinery had been built right before the disturbances. In terms of the dynamics of rent prices and wages it did not really differ from the rest. Importantly, in line with the documental evidence, the rent prices were on the rise since the mid-1890s, even at the time when peasant agricultural productivity remained relatively stagnant. There were no serious harvest failures preceding the uprising, but the district had a notably wide gap in grain yields between communal and private land, the former remaining particularly unproductive (which is also true of the Poltava district), which could be symptomatic of the prevalence of subsistence farming.

This statistical comparison supports the findings of the previous, qualitative section. This analysis projects the image of relatively impoverished and rapidly growing peasant population locked in backward subsistence agriculture, sensitive to the proliferation of market-driven demand for land and rent practices replacing more habitual arrangements.

Table 3.1: Poltava Province. Selected District Characteristics

district	Number of peasant households		Peasant population			Urbanization		% literate	% households without cattle		% of serfs	% of black soil	% of good soil
district/year	1880s	1900	1880s	1900	% gr	1879	1900	1897	1880s	1900	1859		
Gadyachskii	19,627	21,889	110,623	131,387	19	7	5	16	30	29	39	78	86
Zen'kovskii	20,440	23,201	106,014	127,409	20	8	7	16	41	38	20	79	97
Zolotonoshskii	33,463	37,558	177,755	213,788	20	8	4	15	32	29	39	67	85
Kobelyakskii	29,934	33,504	174,753	200,232	15	7	5	16	40	37	24	66	77
Konstantinogradskii	**29,414**	**34,302**	**181,498**	**220,846**	**22**	**6**	**3**	**16**	**22**	**19**	**54**	**79**	**88**
Kremenchugskii	24,159	26,415	138,127	157,367	14	25	29	23	33	35	27	78	81
Lokhvitskii	23,100	24,646	124,843	136,994	10	7	6	16	30	28	35	40	90
Lubenskii	17,708	19,819	100,580	121,467	21	7	7	16	29	27	31	64	85
Mirgorodskii	21,094	24,376	111,219	140,436	26	6	7	14	35	34	36	64	84
Pereyaslavskii	28,291	30,263	151,824	168,585	11	7	8	15	26	24	34	28	59
Piryatinskii	24,031	25,432	136,760	152,781	12	4	5	14	22	18	61	66	100
Poltavskii	**25,070**	**29,459**	**134,541**	**168,730**	**25**	**21**	**23**	**21**	**37**	**35**	**34**	**46**	**68**
Prilukskii	26,179	28,353	143,475	162,710	13	7	10	20	21	19	52	50	97
Romenskii	25,138	27,491	148,262	163,768	10	7	14	19	29	29	33	48	86
Khorol'skii	23,983	25,996	140,239	159,807	14	4	5	15	30	28	45	75	93

Sources: Svavitskii and Svavitskaya 1926, Troinitskii 1904.

Table 3.2: Poltava Province. Land Tenure and Household Characteristics by Districts

district	% allotment land		% peasant land		Allotment land per capita, desyatinas		Peasant land per capita, desyatinas		% households with migrant labourers		% households without arable land		% households renting land		% households renting arable land	
year	1877	1905	1877	1905	1877	1905	1877	1905	1880s	1900	1880s	1900	1880s	1900	1880s	1900
Gadyachskii	65	57	68	61	1.0	0.7	1.1	0.7	-	-	15	3	39	41	27	24
Zen'kovskii	40	48	42	68	1	0.6	1.1	0.7	16	9	32	7	-	-	-	-
Zolotonoshskii	63	52	67	59	0.8	0.6	0.9	0.9	22	20	24	6	37	43	31	41
Kobelyakskii	72	54	78	57	1.3	0.7	1.4	0.7	19	11	23	6	46	43	41	33
Konstantinogradskii	**34**	**36**	**36**	**66**	**1.3**	**0.7**	**1.4**	**1.3**	**2**	**1**	**13**	**2**	**50**	**46**	**32**	**25**
Kremenchugskii	50	47	53	64	1.1	0.6	1.2	0.8	16	11	25	6	48	46	48	40
Lokhvitskii	66	53	69	58	1.2	0.7	1.3	0.8	19	18	18	4	38	38	31	25
Lubenskii	53	50	57	69	1.0	0.7	1.1	0.9	5	7	19	3	36	42	22	27
Mirgorodskii	58	51	60	58	1.1	0.6	1.1	0.7	-	-	25	5	41	44	29	30
Pereyaslavskii	59	50	61	60	1.3	0.8	1.4	0.9	3	8	18	3	39	35	33	23
Piryatinskii	41	43	43	57	0.8	0.6	0.8	0.9	16	8	12	2	53	50	38	34
Poltavskii	**46**	**40**	**50**	**53**	**0.8**	**0.5**	**0.9**	**0.7**	**5**	**3**	**32**	**7**	**37**	**39**	**29**	**28**
Prilukskii	58	50	59	56	1.0	0.6	1	0.7	6	8	10	2	48	41	34	23
Romenskii	61	58	63	64	0.8	0.7	0.8	0.7	11	14	18	4	40	35	34	24
Khorol'skii	48	40	51	53	1.0	0.6	1.1	0.7	10	9	20	4	51	50	46	39

Sources: Svavitskii and Svavitskaya 1926, Tsentralnyi statisticheskii komitet MVD 1907, author's calculations.

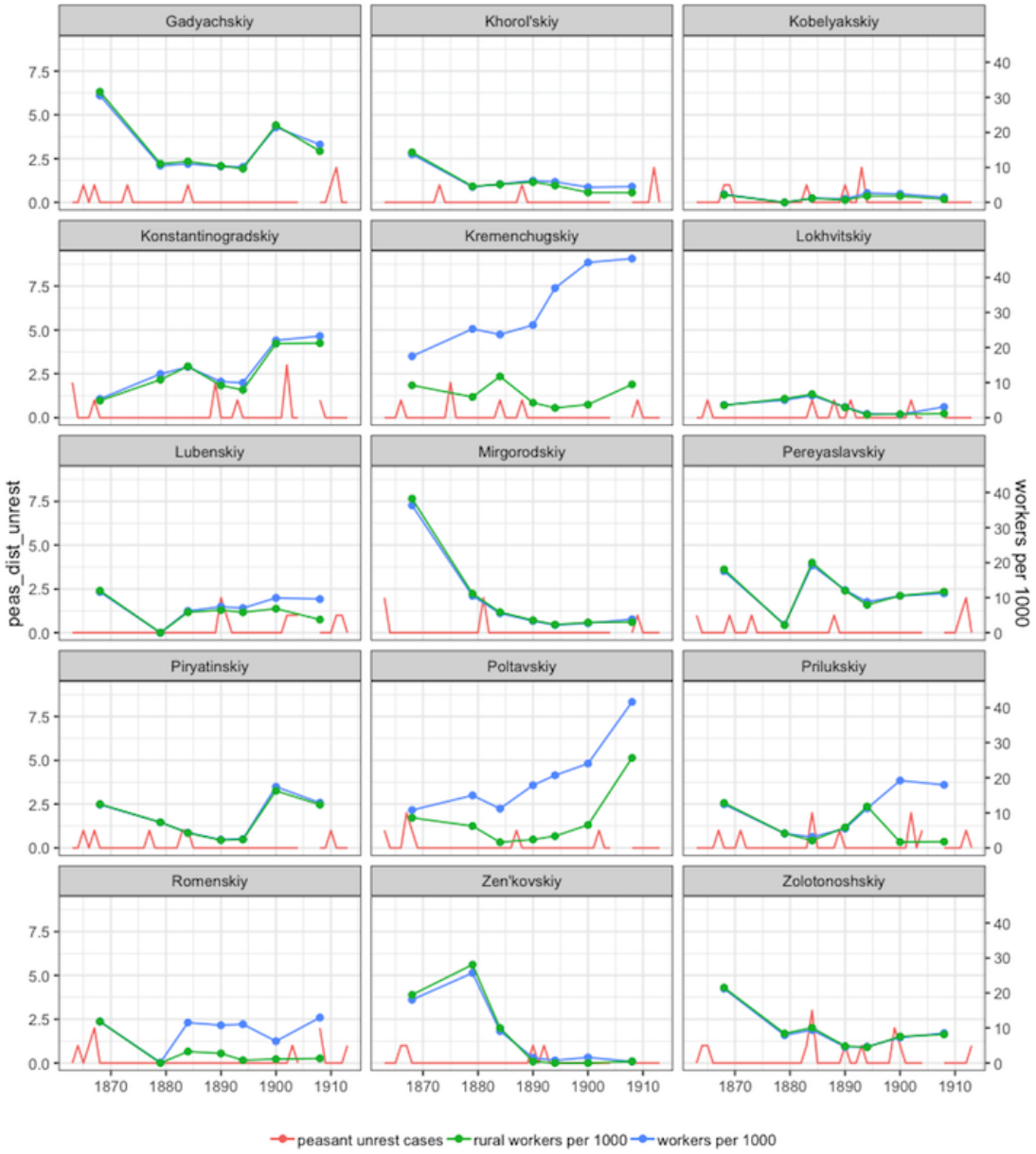

Figure 3.4: Yearly dynamics of peasant unrest (left axis) and total and rural industrialization (number of workers per 1000 total (rural) dwellers; right axis) in the districts of the Poltava province in 1879–1913 for known years.

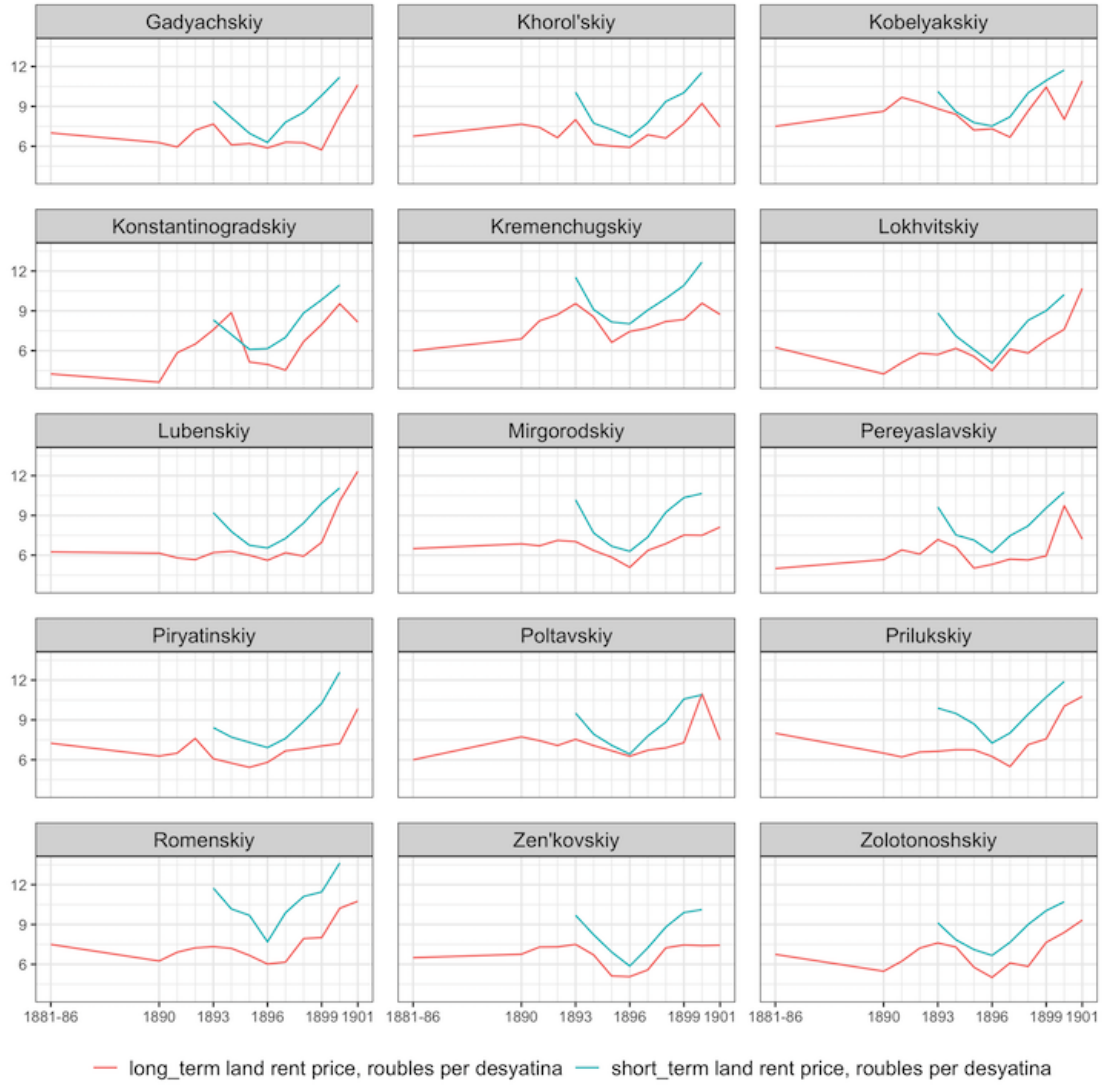

Figure 3.5: Dynamics of land rent prices in the districts of the Poltava province in 1881–1901, rubles per *desyatina*. Sources: Troshchinskii 1887, III. Otdel statisticheskii, p. 159; Statisticheskoye biuro Poltavskogo gubernskogo zemstva 1901, p. 125; Statisticheskoye biuro Poltavskogo gubernskogo zemstva 1902, p. 66, tables; author's calculations.

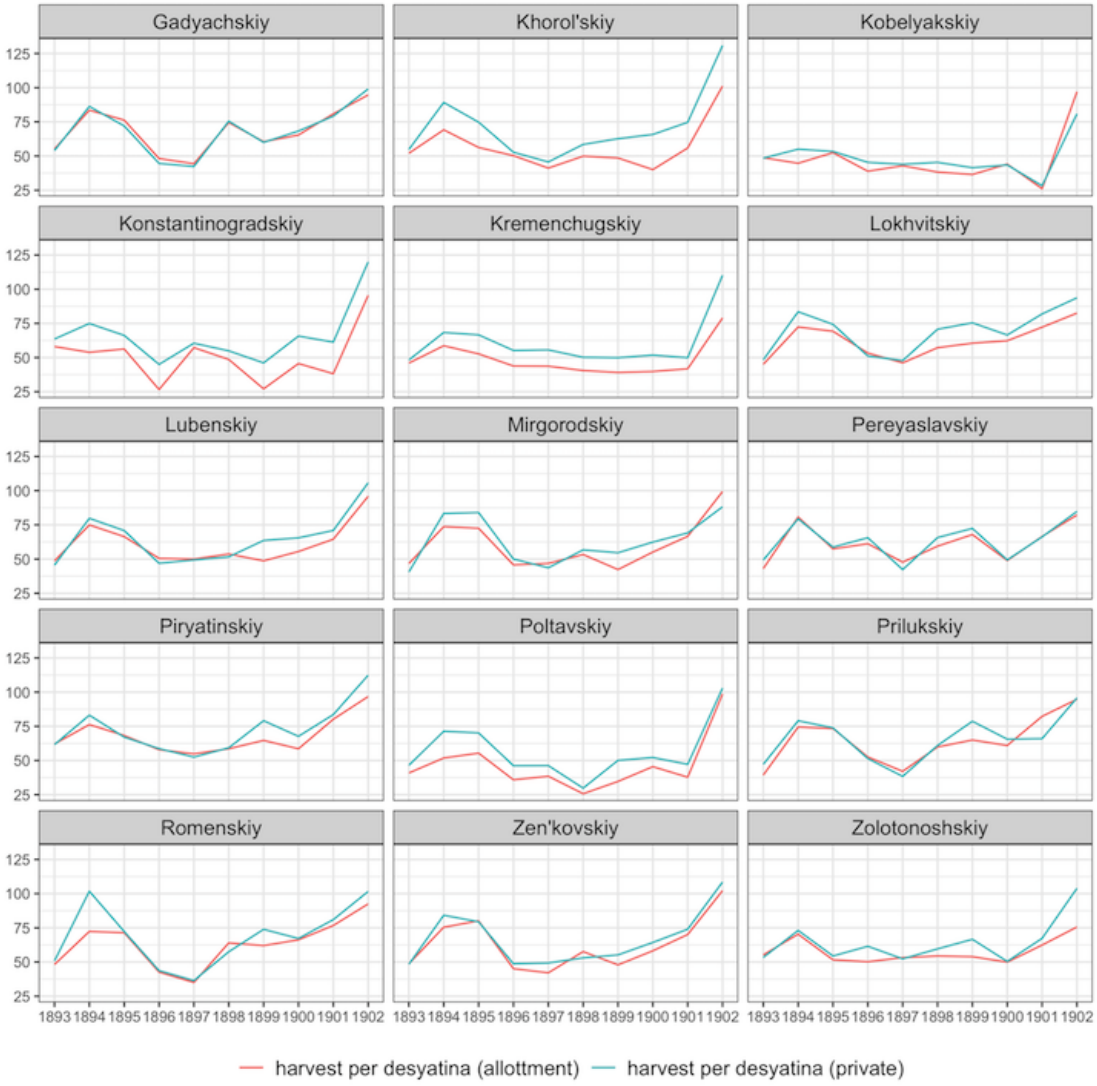

Figure 3.6: Yearly dynamics of winter rye harvest on allotment and private land in the districts of the Poltava province in 1893–1902, *puds* per *desyatina*. Source: Tsentralnyi statisticheskii komitet MVD 1893 - 1902, various years.

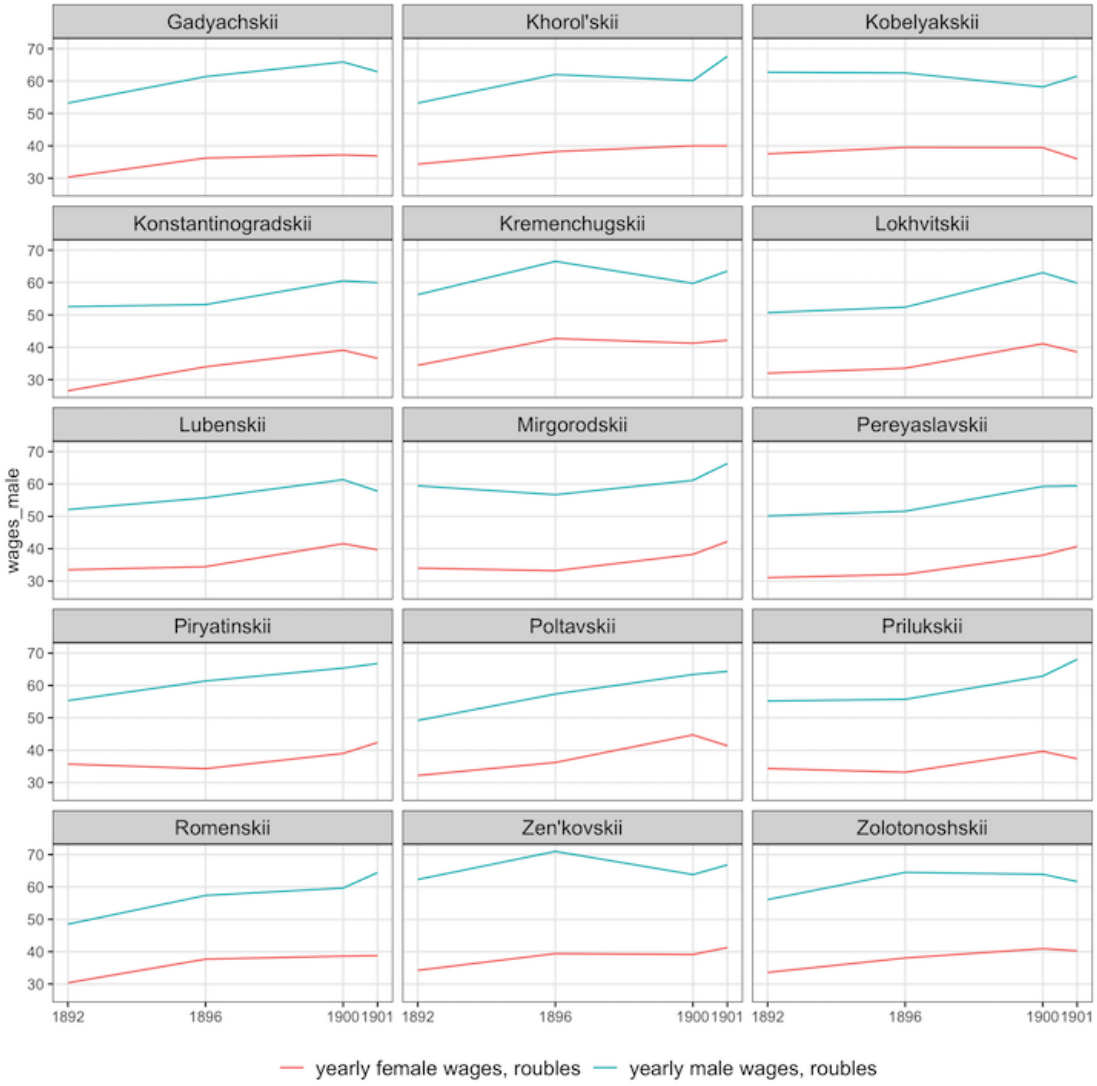

Figure 3.7: Yearly wages of agricultural workers in the districts of the Poltava province in 1892, 1896, 1900, and 1901, rubles per year. Sources: Statisticheskoye biuro Poltavskogo gubernskogo zemstva 1901, Statisticheskoye biuro Poltavskogo gubernskogo zemstva 1902

Table 3.3: Poltava province. Average Rye Prices in 1889—1901, Kopecks per Pud

Disctrict	1889-1894	1894-1899	1898-1899	1900-1901
Gadyachskiy	64	38	52	47
Zolotonoshskiy	59	35	46	49
Zen'kovskiy	60	36	49	52
Kobelyakskiy	62	37	49	52
Konstantinogradskiy	60	37	46	50
Kremenchugskiy	61	36	48	51
Lokhvitskiy	60	36	50	46
Lubenskiy	59	35	49	46
Mirgorodskiy	58	35	48	46
Pereyaslavskiy	61	40	52	51
Piryatinskiy	56	35	46	43
Poltavskiy	63	38	54	48
Prilukskiy	62	41	54	47
Romenskiy	65	41	53	48
Khorol'skiy	61	36	47	50

Sources: Statisticheskoye biuro Poltavskogo gubernskogo zemstva 1901, p. 159; Statisticheskoye biuro Poltavskogo gubernskogo zemstva 1902, p. 167.

3.5 Formal Model

3.5.1 Exposition

The game presented in this section is a stylized picture of conflict between landlords and peasants related to land ownership and usage distribution. It allows us to model important features described in our analysis of the Poltava-Kharkov uprising and summarized in the previous discussion: land distribution, the presence of outside options for the peasantry (industrial employment and wages), productivity differentials between peasant and the landlord farming, and decisions of the landlord with regards to renting out his land. Although this model utilizes a highly simplified setting, omitting some important features or incorporating them as fixed parameters, it provides an "analytical narrative" refining my interpretation of the peasant unrest and highlighting the main theoretical points.

This one-shot game is partly built on Finkel and Gehlbach 2020 (who model random utilities following Passarelli and Tabellini 2017), from which I borrow a probabilistic modeling of a two-player landlord-peasant conflict over a limited resource with the random cost of unrest to the peasants, but introduce a more complex economic setting affecting the players' expected utility. It has two players: the landlord[29] and the peasants, both owning their shares of the limited land resources. The peasants cultivate land (which may be largely associated with subsistence farming) and/or are employed in industry, allocating their labor effort between these two occupations. The landlord faces two options: he can either hire agricultural laborers and attract tenants from outside or lease land to the local peasantry at a fixed rate.[30] He decides on the share of her land to be leased to the peasants. The peasants can rebel, potentially expropriating the landlord and gaining control over all the land. They decide whether to rebel or not, depending on the relative attractiveness of a revolt and their regular economic activities given the existing land distribution. It should be stressed that this game models interactions between agents at the local level, in accordance with my empirical analysis, and does not explicitly deal with general equilibrium issues of the inter-sectoral allocation of the

[29] Although conflicts between landlords and peasants seem to have attracted most of the attention in the literature, in the context of the Russian Empire conflicts of this kind could arise between peasants and the state (which owned a lot of land, primarily non-arable), in particular, regarding usage of forests. In this case the state or its representatives could play a similar role. Of course, there were other types of unrest, for instance, peasant resistance to taxation or other state actions, which are not addressed by this model. I believe that it is justifiable given that the land- and forest-related conflict was still prevalent.

[30] It might have been more realistic to assume that local peasants can also be hired as laborers by the landlord given that, for example, reliance on peasant labor is a defining property of the labor-repressive or labor-dependent agriculture (Moore 1966). However, this will make both the peasants' and the landlord's choice more complicated, whereas my model already illustrates the salient features of this important concept: if the peasants want to have access to a larger amount of land than they initially have, they have to rent this additional land from the landlord at a price, and even if they still acquire net positive income, the option of rebellion and land seizure remains attractive. It should also be noted that renting out land to local peasants in exchange for labor services was a widespread practice in the Russian Empire, and my model partly reflects that, although in this case the peasants pay a part of their aggregate income.
It might also be possible to define moving to an industrial sector as a separate alternative, in addition to staying in agriculture and rebelling, rather than assuming a continuous labor allocation choice between the two occupations. However, this will just bring additional discontinuity into my model without much gain in substance.

factors of production and output.

3.5.2 Game Setting

Total peasant income y_P is described by the formula:

$$y_P = \underbrace{\gamma[c + \beta(1-c)]^{\alpha} l^{1-\alpha}}_{\text{income from farming}} + \overbrace{(1-l)w}^{\text{industrial employment income}} - \underbrace{r\beta(1-c)}_{\text{land rent payment}} \tag{3.1}$$

This equation, incorporating a constant returns to scale Cobb-Douglas function of agricultural production, contains the following parameters:

$c \in [0,1]$ – the share of the land owned by the peasants (we may think of it as allotment, or communally-owned land). The total amount of land is normalized to unity. Correspondingly, $1-c$ is the land privately owned by the landlord.

$\beta \in [0,1]$ – the share of the private land rented by the peasants. Thus, the peasants rent in total $\beta(1-c)$ of land. The value of β is determined by the landlord.

$\gamma > 0$ – the total factor productivity of the peasant agricultural production function.

$\alpha \in (0,1)$ – the elasticity of the peasant agricultural output with respect to land.

$w > 0$ – industrial employment earnings rate (industrial wages).[31]

$r > 0$ – land rent rate (payment per land unit).

The peasants choose $l \in [0,1]$ – the share of labor spent on farming, which sets its distribution between agriculture and industry. The total labor effort is normalized to 1.

[31] My interpretation of w is broader that just the wage rate. In a stylized way it reflects overall industrial employment opportunities. A higher w means not only higher wages, but also more industrial enterprises nearby, lower transportation costs, etc. Given the costs of search and communication, areas with only a few enterprises can have expected w close to 0. As an additional justification of such interpretation, we may think of the peasantry as a compound player aggregating behavior of multiple individuals. For example, the same share $1-l$ of peasants abandoning agriculture and seeking for industrial jobs can expect to earn more if there are more industrial enterprises around. Therefore, in the empirical analysis the level of industrialization may reflect industrial income opportunities for the peasants.

The landlord's income y_L is described by the expression:

$$y_L = \underbrace{\psi[(1-\beta)(1-c)]^{\alpha}}_{\text{income from own farming}} + \underbrace{r\beta(1-c)}_{\text{land rent income}} \tag{3.2}$$

For the sake of simplicity, the landlord's production function depends only on the land input, and I don't model the optimal labor choice (assuming that it concerns only the labor input external to the model), which can be conceptualized as entering the parameter ψ along with the total factor productivity.

The parameters w and ψ can be interpreted as reflections of the two countervailing features of economic development and industrialization: on the one hand, increasing peasants' incomes and provision of additional employment opportunities; on the other hand, potential encroachment on more traditional sources of their earnings and subsistence due to technological progress and market development, which change the patterns of land and labor allocation.

3.5.3 Game Sequence

The game proceeds as follows:

1) The landlord chooses β, the share of the landlord's land to be rented out to the peasants (the remaining land will be farmed by hired laborers or outside tenants), which is accepted by the peasants.[32]

[32]The peasants' acceptance of the landlord's preferred β may be thought of as conditional because it will be voided in case of a peasant revolt, but will stay effective if the peasants abstain from revolting.

It would be possible to model it as a bargaining process, where the peasants either accept or reject the offer before deciding on revolting, however, it would unnecessarily increase the complexity of the model. The object of my analysis is the situation when the peasants are willing to rent at least the amount of land offered by the landlord at a given rate. Appendix 1 demonstrates that for the values of r below a certain threshold, depending on the parameters of the peasant production function and industrial wages, they would like to rent all the landlord's land, whereas once this threshold is exceeded, they prefer not to rent at all. The simulations presented below are based on the calibration of parameters corresponding to the

2) Random cost of the unrest ϵ is realized, observable only by the peasants.

3) The peasants compare their payoffs from revolting and staying peaceful, and decide whether to revolt or not. In order to calculate their payoffs they optimize their income y_P in l given the actual β^*, defined in the first step.

4) A revolt either happens or not. If it occurs, it can be either a success or a failure with a certain probability. Then the payoffs of the players are realized.

3.5.4 Players' Payoffs and Actions

The peasants' expected payoff from a revolt is

$$py_P(c = 1, l = l^*_{c=1}) + (1 - p) \cdot 0 - \epsilon \tag{3.3}$$

where p is the probability of a revolt's success, and $\epsilon \sim U[-\frac{\sigma}{2}, \frac{\sigma}{2}]$ is the uniformly distributed random cost of revolt. It is realized prior to the peasants' decision regarding a revolt, but is unknown to the landlord beforehand. In case of success, the peasants take over all the landlord's land (c takes the value of 1). If the revolt fails, the peasants lose everything; their payoff is normalized to 0.[33]

The peasants rebel if their expected payoff in case of a revolt exceeds their normal income $y_P(l = l^*)$ for a given β. With a given β, the optimal l^* can be found by solving

former situation. It makes sense in view of much of the historical literature, which depicts tensions due to insufficient land provision on the part of the landlords, exacerbated by modernization of their farming and commercial practices.

[33]This is another simplifying assumption, given that even after a revolt the peasants' land was not typically confiscated and most of them could continue their routine activities. On the other hand, proven participants of disturbances were more or less harshly punished, including imprisonment or exile (this could also be part of random rebellion costs which are born in any case). The contrast between the peasants' payoffs in the cases of a success or a failure of a rebellion embedded in the model may seem quite stark, but it conveys the main theoretical ideas.

the following optimization problem:[34]

$$\max_{0\leq l\leq 1} \gamma[c+\beta(1-c)]^{\alpha} l^{1-\alpha} + (1-l)w - r\beta(1-c)$$

The landlord chooses β^* that maximizes his utility, given the trade-off between the risk of rebellion and full expropriation and the profitability of his own farming. The landlord's expected utility for a given β is:

$$\Pr(\text{revolt} \mid \beta)[p \cdot 0 + (1-p)y_L(\beta)] + [1 - \Pr(\text{revolt} \mid \beta)]y_L(\beta) = [1 - p\Pr(\text{revolt} \mid \beta)]y_L(\beta) \tag{3.4}$$

I assume that the landlord loses all his land in case of a successful revolt, but bears no costs in case of an unsuccessful revolt.

3.5.5 Game Solution

Formally, a peasant revolt takes place if

$$y_P(l = l^*) < py_P(c = 1, l = l^*_{c=1}) - \epsilon$$

that is,

$$\epsilon < py_P(c = 1, l = l^*_{c=1}) - y_P(l = l^*)$$

Thus, the probability of a revolt from the landlord's perspective is the following:

$$\Pr(\text{revolt} \mid \beta) = \frac{1}{\sigma}\left(py_P(c = 1, l = l^*_{c=1}) - y_P(l = l^*) + \frac{\sigma}{2}\right) \tag{3.5}$$

[34]The optimization solution is analyzed below in Appendix 1.

As in Finkel and Gehlbach 2019, I assume σ to be large enough to guarantee that this probability lies between 0 and 1.

The landlord chooses β to maximize his utility:

$$\max_{0 \leq \beta \leq 1} [1 - p\text{Pr}(\text{revolt} \mid \beta)] y_L(\beta).$$

Due to nonlinearities present in the optimization conditions, there is no closed-form solution for the optimal β^*. Therefore, I use simulations for a calibrated model, supplemented by analytical derivations. The main quantities of interest will be the optimal β^*, the probability of unrest and its sensitivity to the share of peasant land. Unfortunately, further linearization of the model in order to get a more tractable solution is not warranted because it will lose some substantive properties.[35]

3.5.6 Comparative Statics: Simulation Results and Discussion

Simulation results of a calibrated model presented in Figure 3.8 illustrate the basic logic of the theory. I consider different values of c (the share of the peasant land), w (industrial wages), and ψ (total factor productivity of the landlord's farming), keeping the remaining parameters constant.

Predictably, as the share of the allotment land (c) expands, the probability of unrest declines. The share of the landlord's land rented by the peasants declines as well, until it reaches zero. Increasing potential earnings from industrial employment (w) as expected weakens incentives for unrest at a given level of communal land ownership as the peasants shift the focus of their labor effort away from agriculture. It can be seen that at the

[35] With linear production functions we will get corner solutions where peasants either employ all their labor in agriculture or industry, or a knife-edge equilibrium under which they are indifferent with respect to the allocation of labor between the two activities. The same is true for the landlord's allocative decisions.

lower levels of w a decrease in the probability after a certain level of c is actually steeper than in the case of higher w's. It means that the mitigating effect of a higher c on the probability of unrest in absolute (although not necessarily relative) terms after a certain levels of c is achieved will be less intensive with a higher industrial income. This effect heterogeneity will be considered in more detail below.

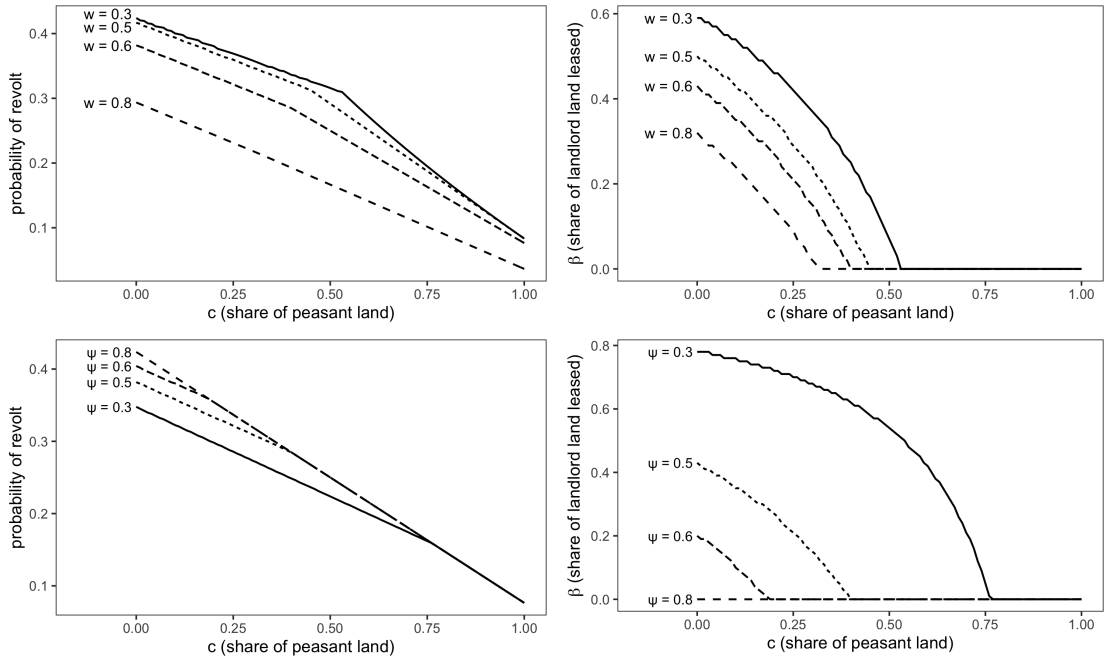

Figure 3.8: Model simulation results:
Top row: probability of revolt (left) and share of the landlord's land leased to the peasants (right) at various levels of w (industrial earnings) and c (the share of land owned by the peasants). Parameter values: $\alpha = 0.5$, $r = 0.3$, $\gamma = 1$, $\psi = 0.5$, $p = 0.5$, $\sigma = 1.2$.
Bottom row: probability of revolt (left) and share of the landlord's land leased to the peasants (right) at various levels of ψ (the productivity of the landlord's farming) and c (the share of land owned by the peasants). Parameter values: $\alpha = 0.5$, $r = 0.3$, $\gamma = 1$, $w = 0.6$, $p = 0.5$, $\sigma = 1.2$.

Productivity of the landlord's agriculture is another important factor behind the land rent decisions of the landlord and peasant discontent. The bottom row of Figure 3.8 shows that the probability of a revolt is a nondecreasing function of ψ, although as c grows, the effect of ψ is present only at lower levels of ψ, and the latter ceases to have

any influence on unrest in the upper end of the c range. This happens because at higher levels of ψ the landlord becomes increasingly reluctant to lease any land to the peasants, and β stays at the same zero level. Optimal β^*'s taking zero values at certain combinations of c, w and ψ signify a sort of "decoupling" of the peasants' and landlord farming.

The effect of the share of allotment land on the probability of unrest is seemingly close to linear or piecewise linear, depending on the values of w, ψ and other parameters. We can further analyze it using the formula for the optimal peasant income from :

$$\left((1-\alpha)^{\frac{1-\alpha}{\alpha}} - (1-\alpha)^{\frac{1}{\alpha}}\right)\gamma^{\frac{1}{\alpha}}\left(\frac{1}{w}\right)^{\frac{1-\alpha}{\alpha}}[c+\beta^*(1-c)] + w - r\beta^*(1-c) \tag{3.6}$$

Plugging this expression into the formula for the probability of revolt (Equation 3.5), regrouping and retaining only the part depending on c, we get the following:

$$-\frac{1}{\sigma}\left[\left((1-\alpha)^{\frac{1-\alpha}{\alpha}} - (1-\alpha)^{\frac{1}{\alpha}}\right)\gamma^{\frac{1}{\alpha}}\left(\frac{1}{w}\right)^{\frac{1-\alpha}{\alpha}} - (1-r)\beta^*\right]c \tag{3.7}$$

It should be emphasized that β^* itself is a function of c. Nevertheless, it is useful to consider the expression in square brackets separately, as a "coefficient" on c, in order to demonstrate its sensitivity to different parameter values. As long as the left term within square brackets exceeds the right one, we have an expected negative relationship between c and probability of unrest. The left term unambiguously negatively depends on the value of w, but the overall effect depends on the reaction of β^* to changes in w and c. Figure 3.9 plots the square brackets part of Equation 3.5 against c at four different values of ψ and three values of w.[36]

There are three major tendencies illustrated by this figure. First, the values of the coefficients are almost always negative, and at higher values of c the plotted curves turn

[36]I do not include results for $w = 0.3$, because, according to the simulations, at virtually any level of c the peasants are fully employed in agriculture, and Expressions 3.6 and 3.7 are irrelevant.

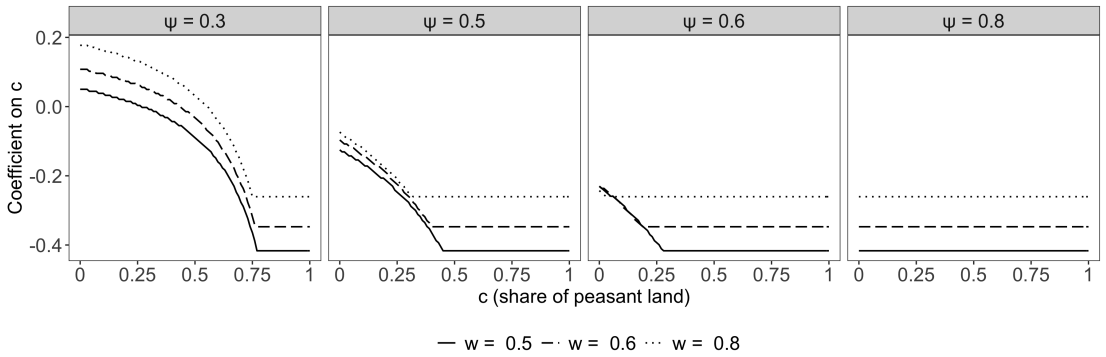

Figure 3.9: Simulation results for the sensitivity of probability of revolt to changes in c, $-\frac{1}{\sigma}\left[\left((1-\alpha)^{\frac{1-\alpha}{\alpha}}-(1-\alpha)^{\frac{1}{\alpha}}\right)\gamma^{\frac{1}{\alpha}}\left(\frac{1}{w}\right)^{\frac{1-\alpha}{\alpha}}-(1-r)\beta^{*}\right]$ (Equation 3.7), at different levels of w (industrial wages), ψ (the productivity parameter of the landlord's farming) and c (the share of land owned by the peasants). Other parameter values: $\alpha = 0.5$, $r = 0.3$, $\gamma = 1$, $p = 0.5$, $\sigma = 1.2$.

flat, which owes to the fact that β falls down to 0 because the landlord feels less pressure to rent out the land. Second, the more productive is the landlord's farming (the higher is ψ), the lower the level of c at which the coefficient on c reaches a plateau, so that the overall coefficient on c is non-increasing in ψ. At $\psi = 0.8$ the curves are flat at any c and w. It occurs because the higher productivity of the landlord's own farming activities makes it less attractive to lease the land to the peasants, thus β rapidly diminishes to 0. Third, higher industrial wages virtually always lead to a higher coefficient on c, that is, to a smaller negative (or, at the lowest ψ, even a positive) coefficient for a low enough c.

These results confirm the ambiguous influence of the two main aspects of industrialization. Greater income from industrial employment can decrease the probability of unrest at a given level of land inequality. In contrast, rising productivity and profitability of the private landowners' estates, which in reality could be closely associated with industrial development, in particular processing of cash crops, made them rent out less land to the peasants or raise rent prices at the risk of higher unrest.

The discussion in Appendix 1 shows that when r rises, the peasants' net income will be declining, and once a certain threshold is passed, it will no longer be in the peasant

interests to rent any land. This will make the peasants more willing to revolt in order to get this land.[37] It should change the current model setting, because it will be irrational on the part of the peasants to accept any β offered by the landlord, except for 0, and there will be no opportunities for strategic behavior on his part. In the literature, increasing land rent, due to growing commercialization of the agriculture, was named among the main reasons behind peasant discontent.

By the same token, a *decrease in the probability of unrest* in response to an increase in c gets smaller (or even turns to an increase) as industrial wages rise, and rises in absolute terms or stays the same as the productivity parameter of the landlord's farming rises. In other words, the probability of revolt becomes less dependent on land inequality as the attractiveness of industrial employment rises, whereas, at a low enough level of c, the opposite is true for the profitability of the landlord's farming.

3.6 Conclusion

My analysis of the 1902 Poltava-Kharkov uprising demonstrates both the complex nature of this event and a remarkable consistency of most available accounts with respect to the motives and actions of its participants. "Land hunger" experienced by the communal peasantry and ensuing conflicts with large private landowners, often heirs of serf-owning landlords, and their tenants is a dominant theme of most memos, reports, and testimonies. Commercialization of agriculture, the transition to market land rent, rural-based industrialization, especially the building of food processing industrial establishments, could have contributed to rising peasant discontent. Many peasants suffered from the lack of opportunities for non-agricultural work and prohibitively high costs of outmigration. This was exacerbated by rapid population growth, but the rising

[37] This effect can be reinforced if r is made a function of the landlord's farming productivity.

agricultural productivity of private estates and the creation of factories requiring locally grown raw materials, thus directly competing for land with the peasants, could have accelerated peasant grievances.

Such factors as active anti-landlord and anti-government propaganda, periodical crop failures, or low state capacity could have played an important role in provoking and facilitating the disturbances, but there were deeper conditions determined by patterns of land distribution and ongoing economic transformation that produced peasant discontent and channeled it into action under conducive circumstances.

The logic of conflict is captured by a formal model, which builds on Finkel and Gehlbach 2020, and which also contains simulated comparative static results for a calibrated model. It considers a one-stage game between the landlord and the peasants (modeled, for simplicity, as a unitary actor), both owning their share of land. The peasants can derive income from the cultivation of their own land and the land they rent from the landlord at a fixed rate, and they can also spend an arbitrary share of their labor effort on work in the industry, receiving fixed wages in return. The landlord decides on the division of his land between the two uses: rent out land to the peasants or cultivate it "on his own," that is, using externally hired laborers or leasing it to individual tenants. The peasants decide whether to revolt against the landlord, potentially seizing all the land in case of success, but losing everything in case of failure, and bearing random costs of rebellion in both cases.

Industrial wages and the productivity of the landlord's agriculture reflect the two sides of industrialization. Whereas higher industrial wages, decreasing the relative value of income from land cultivation, reduce the probability of unrest, the greater productivity of the landlord's farming activities, which in practice can also be associated with industrialization (e.g. sugar refining or processing of other agricultural produce, as can be seen in my analysis of Poltava-Kharkov events), makes him reduce the quan-

tity of land rented out to the peasants, potentially producing more discontent on their part.

A larger share of land owned by the peasants predictably leads to a lower probability of unrest. In line with the discussion in the previous theoretical chapters, the effect of land inequality on unrest is conditional on the industrialization parameters: at higher wages and lower landlord productivity, it tends to take smaller (in absolute terms) negative or even positive values. This result supports my intuition that expansion of industrial employment opportunities would make peasant discontent considerably less sensitive to changes in land inequality, but only if industrial development is not accompanied by growing agricultural productivity and commercialization. This logic is consistent with the fact that in the Konstantinograd district, where the Poltava-Kharkov uprising started, *both* the share of communal allotment land and the percentage of households with migrant workers (proxying the peasants' access to outside options, in particular, industrial employment) were the lowest in the province. The role of the landlord's farming productivity is particularly pronounced at lower levels of peasant landownership: when the former gets high enough, the landlord ceases to rent out any land to the peasants regardless of the existing land distribution.

Appendix 1: The Amount of Rented Land Preferred by the Peasants in the Formal Model

In my formal model I assume that the peasants accept any β offered by the landlord unless they rebel. It is interesting to analyze the conditions under which this behavior is rational for the peasants. β_P, the β potentially desirable by the peasants, should be a result of the optimization of their regular income y_P with respect to *both* l and β, which

brings an optimal peasants' labor input l^* and a rented land share β_P. That is,

$$\{l^*, \beta_P\} = \underset{l,\beta\in[0,1]}{\operatorname{argmax}}\, y_P$$

Now it can be demonstrated that under certain conditions the peasants effectively choose a binary desirable β_P equal to either 0 or 1. $\beta_P \equiv 1$ justifies my model setting: the landlord's supply of land for rent will never exceed the peasants' demand. Consider maximization of the peasants' income with respect to their labor input, l:

$$\max_{0\le l\le 1} \gamma[c+\beta(1-c)]^{\alpha} l^{1-\alpha} + (1-l)w - r\beta(1-c) \tag{3.8}$$

In order to find the first-order conditions, I take the derivative of this expression with respect to l and find its optimal value as follows:

$$(1-\alpha)\gamma[c+\beta(1-c)]^{\alpha} l^{-\alpha} = w$$

$$l^{\alpha} = \frac{(1-\alpha)\gamma}{w}[c+\beta(1-c)]^{\alpha}$$

$$l^* = \left[\frac{(1-\alpha)\gamma}{w}\right]^{\frac{1}{\alpha}} [c+\beta(1-c)] \tag{3.9}$$

Thus, the first-order conditions are:

$$\begin{cases} l^* = 0, & \text{if } \left[\frac{(1-\alpha)\gamma}{w}\right]^{\frac{1}{\alpha}} [c+\beta(1-c)] = 0 \\ l^* = \left[\frac{(1-\alpha)\gamma}{w}\right]^{\frac{1}{\alpha}} [c+\beta(1-c)], & \text{if } \left[\frac{(1-\alpha)\gamma}{w}\right]^{\frac{1}{\alpha}} [c+\beta(1-c)] \in (0,1) \\ l^* = 1, & \text{if } \left[\frac{(1-\alpha)\gamma}{w}\right]^{\frac{1}{\alpha}} [c+\beta(1-c)] \ge 1 \end{cases} \tag{3.10}$$

Let us consider the first and the last cases. $\left[\frac{(1-\alpha)\gamma}{w}\right]^{\frac{1}{\alpha}} [c+\beta(1-c)] = 0$ only if both c

and β are equal to 0. In that case, $l^* = 0$, that is, all the labor is invested in industrial work. When $l^* = 1$, conversely, all the labor is applied in agriculture, and w have no effect on the peasants' utility. It can be shown that in this case the peasants' income is strictly convex in β, and β_L can take different values on $[0, 1]$ depending on the parameter values. Considering my main case of interest, when l^* lies within the (0,1) interval, we get the following maximized y_L:

$$\gamma[c + \beta(1-c)]^{\alpha} \left(\left[\frac{(1-\alpha)\gamma}{w} \right]^{\frac{1}{\alpha}} [c + \beta(1-c)] \right)^{1-\alpha} + \left(1 - \left[\frac{(1-\alpha)\gamma}{w} \right]^{\frac{1}{\alpha}} [c + \beta(1-c)] \right) w - r\beta(1-c)$$

which is further reduced to

$$\gamma \left[\frac{(1-\alpha)\gamma}{w} \right]^{\frac{1-\alpha}{\alpha}} [c + \beta(1-c)] + \left(1 - \left[\frac{(1-\alpha)\gamma}{w} \right]^{\frac{1}{\alpha}} [c + \beta(1-c)] \right) w - r\beta(1-c) =$$

$$\gamma \left[\frac{(1-\alpha)\gamma}{w} \right]^{\frac{1-\alpha}{\alpha}} [c + \beta(1-c)] + w - \left[\frac{(1-\alpha)\gamma}{w} \right]^{\frac{1}{\alpha}} w[c + \beta(1-c)] - r\beta(1-c) =$$

$$(1-\alpha)^{\frac{1-\alpha}{\alpha}} \gamma^{\frac{1}{\alpha}} \left(\frac{1}{w} \right)^{\frac{1-\alpha}{\alpha}} [c + \beta(1-c)] + w - (1-\alpha)^{\frac{1}{\alpha}} \gamma^{\frac{1}{\alpha}} \left(\frac{1}{w} \right)^{\frac{1-\alpha}{\alpha}} [c + \beta(1-c)] - r\beta(1-c) =$$

$$\left((1-\alpha)^{\frac{1-\alpha}{\alpha}} - (1-\alpha)^{\frac{1}{\alpha}} \right) \gamma^{\frac{1}{\alpha}} \left(\frac{1}{w} \right)^{\frac{1-\alpha}{\alpha}} [c + \beta(1-c)] + w - r\beta(1-c)$$

Eliminating the terms which do not depend on β and regrouping, we get

$$\left[\left((1-\alpha)^{\frac{1-\alpha}{\alpha}} - (1-\alpha)^{\frac{1}{\alpha}} \right) \gamma^{\frac{1}{\alpha}} \left(\frac{1}{w} \right)^{\frac{1-\alpha}{\alpha}} - r \right] (1-c)\beta \tag{3.11}$$

This expression shows that there should be the corner solution for the peasants' desirable β: $\beta_P = \{0, 1\}$, and it depends on the sign of the expression in square brackets. If the following condition holds:

$$r < \left((1-\alpha)^{\frac{1-\alpha}{\alpha}} - (1-\alpha)^{\frac{1}{\alpha}} \right) \gamma^{\frac{1}{\alpha}} \left(\frac{1}{w} \right)^{\frac{1-\alpha}{\alpha}}, \tag{3.12}$$

then $\beta_P = 1$; if this inequality is reverted, $\beta_P = 0$. When the exact equality holds, the peasants are indifferent with regards to any $\beta \in [0, 1]$. Given that $\alpha \in (0, 1)$ and $\frac{1-\alpha}{\alpha} < \frac{1}{\alpha}$, the right side of this inequality is always positive.

Chapter 4.

European Russian Empire: District-Level Empirical Analysis

4.1 Introduction

This chapter contains an empirical test of my theory using the novel district-level dataset, including data on peasant unrest, industrialization, and land inequality, which I have collected specifically for this dissertation. I describe the sources and structure of my data, and then proceed to statistical analysis employing a district-year panel for 1879–1904. The findings suggest partial support of my hypotheses: a higher share of allotment land is associated with lower unrest intensity, but its hypothesized influence can be moderated by industrial growth. The marginal association of unrest and overall industrialization is weak, but a more intriguing picture is observed if we disaggregate the industrialization measure.

In line with my theory, the locally sourced food industry, for which we can expect the prevalence of the resource competition channel over the labor absorption channel, is positively associated with unrest, and can strengthen the statistical relationship between unrest and land inequality. On the contrary, textiles, which do not depend to the same extent on local agricultural raw materials and land, are negatively associated with peasant disturbances. I discuss the validity of my results, which are sensitive to the inclusion

of fixed effects, lagged unrest values, and other robustness checks.

4.2 Data

For this project I have compiled an original dataset containing information on industrial development and peasant unrest in the late Russian Empire. The focus is on its European part (excluding the Caucasus, Poland and Finland), which in that period consisted of 50 provinces (*gubernias*) subdivided into 501 districts (*uezdy*) (with some minor variations across time). The data are aggregated at the district level. The list of the main data sources by variable is in Table 4.3.[1]

The data on district-level peasant disturbances were taken from the published collections of documents containing chronicles of peasant unrest (Nifontov and Zlatoustovskii 1960, Shapkarin 1959, Anfimov 1998, Shapkarin 1966, Zaionchkovskii 1968, Ivanov 1964). This is a multi-volume publication, which traces the unrest from the late XVIIIth century up to the revolution of February 1917, excluding the period of 1905–first half of 1907. Each volume contains a collection of archival documents related to certain disturbance episodes, and a "chronicle" consisting of short entries describing particular events and based on official correspondence (for example, police reports) stored in archives, and other sources.[2]

The "peasant movement" chronicles are far from being exhaustive, but there are reasons to consider them quite representative geographically (Litvak 1989), and they are increasingly being used in the political economy literature.[3] I have coded the data on

[1] Another dataset collected for this dissertation focuses on peasant unrest and its possible determinants in one province – the Kursk *gubernia* – in 1905–1906, and deals with a lower-level administrative unit – the parish (*volost*), a district subdivision. It is used in Chapter 5.

[2] For a more detailed discussion of this source for an earlier period see e.g. Finkel, Gehlbach and Olsen 2015.

[3] See, e. g., Finkel, Gehlbach and Olsen 2015 and Dower et al. 2018, who used data for 1851–1871, or Gokmen and Kofanov 2019, who considered the provincial-level count for the 1895–1914 period.

peasant unrest in 1863–1904 and mid-1907–1913 using the scheme largely built on the one applied in Finkel, Gehlbach and Olsen 2015. Unfortunately, no such chronicle covering the European part of the Russian Empire is available for the period of the 1905–1907 revolution, which was characterized by an extraordinarily high level of popular unrest. Given that the earliest year for which I have data on industrialization in all the districts is 1879, in the regression analysis presented in this paper I use district-year event counts only for the years 1879–1904. Each "peasant movement chronicle" entry is converted to the number of events corresponding to the number of districts mentioned.

Although the focus of some of the major works on the peasants' unrest was on their participation in the revolutionary movement or mass revolts, the bulk of the events included in the "chronicles" and considered in my project (in terms of Moon 1999) are individual disturbances (*volneniya*, that is, open confrontations with "seigniorial and/or state authorities") and episodes of "everyday resistance", which can hardly be considered a part of an organized larger movement.[4] Even the intense and widespread peasant unrest in 1905–1907 lacked coordination and was primarily stipulated by local grievances (Perrie 1972).

The data on land ownership structure, in particular allotment land share, originates from the two land censuses conducted in 1877 and 1905, and the data for other years are linearly interpolated and extrapolated. The percentage of serfs in the total district population in 1858 (three years before the emancipation) was kindly provided by Steven Nafziger (Nafziger 2011, based on Troinitskii 1861).

The data on industrial output and the number of workers were taken from the published lists of enterprises based on surveys and censuses conducted by the Department of Trade and Manufactories, Department of Indirect Taxes and the Mining Department,

[4] "Common forms of everyday resistance included theft and vandalism of estate property, poaching game, allowing livestock to graze on seigniorial pasture or woodland..., and illegal timber cutting in seigniorial or state woodland" (Moon 1999, p. 269).

which were part of the Ministry of Finance.[5]

The information comes from 1894/95, 1900 and 1908 censuses,[6] and Petr Orlov's lists of enterprises based on official survey materials for the years 1879, 1884, and 1890. The enterprise-level indicators of the output and the number of workers were coded at the enterprise level and then aggregated at the district (*uezd*) level. The data on metallurgical enterprises (only iron- and steel-making), which were concentrated in a handful of districts, were taken from yearbooks published by the Mining Scientific Committee.

Overall these data represent the whole manufacturing industry except for the non-iron metallurgy. The data are available at six quite evenly spaced points of time: 1879, 1884, 1890, 1894, 1900, and 1908. I had to use linear interpolation in order to produce yearly data for 1879–1904. The district-level number of workers normalized by the total population (per 1000 people) is used as a measure of industrialization.

The population data, available only for selected years, were also interpolated (assuming constant growth rate) in order to obtain estimates for each year. The railroad network was geocoded using GIS data on the current location of railroads (which has not significantly changed since the time of construction) and chronological lists of the railroad lines built in Imperial times (see Table 4.3). These data include only railways in public (not private) use. Almost all of the public-use railway lines (publicly or privately owned) mentioned in the lists were identified and included in the dataset.

The data on terrain ruggedness and the share of good soil based on FAO spatial data were provided by Steven Nafziger (Buggle and Nafziger 2017). The temperature and precipitation data were calculated based on the information provided by Global Historical Climatology Network. I took average deviations in 1879–1904 from the 1871–1906 district average. The number of weather stations for which information is available

[5]Detailed description and critical assessment of the Imperial industrial statistics can be found in Rybakov 1976, Yatsunskii 1973, Koval'chenko 1979 (Ch. 1), and Voronkova 1995.

[6]Which are also increasingly being used by scholars, e.g. Gregg 2020.

is much smaller than the number of districts, therefore temperature and precipitation for each district were inferred from the nearest station.

4.3 Hypotheses Testing

The baseline estimated model is a linear panel with year and/or fixed effects, and the generic specification is:

$$Y_{it} = \beta_1 I_{it} + \beta_2 AL_{it} + \beta_3 I_{it} * AL_{it} + \gamma X_{it} + \alpha_i + \mu_t + \varepsilon_{it}, \tag{4.1}$$

where Y_{it} is the number of peasant unrest cases in district i and year t in 1879–1904.

I_{it} is the level of industrialization measured by the logged amount of workers per 1000 people; it can be the total industrial employment in a given region, or its subcategories: various industries or rural/urban decomposition. Given that the original industrial census data are available only for selected years, the remaining yearly values were linearly interpolated. This is justifiable given that the known values are relatively evenly distributed over time (at 5 to 8 year intervals), and the distance between them is not excessive. The data were winsorized at the first and last percentiles in order to account for outliers. The original data contained a lot of zeros; for that reason I used a simple version of the Box-Cox log transformation, adding to the value of each observation half of the minimum of the non-zero values of the variable before taking logarithms. AL_{it} is the share of allotment land in the total land area. This variable is also interpolated on the basis of its levels in 1877 and 1905.

Both the industrialization and land inequality measures are demeaned, therefore the coefficient on industrialization is the effect of its deviation from the mean (assuming the validity of the causal interpretation) at the mean level of the share of allotment land.

X_{it} is the vector of control variables, and γ is the vector of corresponding coefficients. Among the controls are temperature shocks: the deviation of spring temperatures and summer precipitation from the 1871–1906 average. High spring temperatures, occurring in the early growing season, can severely damage grain yield (Grosfeld, Sakalli and Zhuravskaya 2020); excessive summer precipitation can disrupt harvesting. Past incidence of serfdom, measured by the percentage of serfs in the total population, could both provoke unrest and impede economic development (Buggle and Nafziger 2017). Similarly, soil fertility (measured by the share of fertile soil in total land area) can be associated with both intensity of competition over land and the structure and pace of industrial development.[7]

Railway density embodies another important modernization component closely related to industrialization: improved transportation and communication could facilitate the spread of disturbances, but also the timely deployment of police and military personnel to suppress them. Such variables as terrain ruggedness, forest coverage, and river density are routinely used in conflict studies. In order to account for repressive capacity, I add a binary variable which is equal to one if within a given district there is a provincial capital, where there would usually be a concentration of troops and police; in addition, provincial governors residing in provincial capitals bore personal responsibility for suppression of larger disturbances.[8]

I also control for the geographical proximity of the district centroid to Moscow and Saint Petersburg, the two Imperial capitals. I use a raw count of peasant unrest events, therefore each specification includes log rural population (interpolated) and district area. Obviously, the models with district fixed effects contain only time-varying controls. The dummy for the territory of the former Poland-Lithuania state, parts of which

[7]This measure is taken from Dower et al. 2018, who "define fertile soil as any of the following types...: chernozem, greyzem, histosol, kastanozem, phaeozem, or vertisol" (p. 132).

[8]Although it was not necessarily reflected in their career trajectories (Gokmen and Kofanov 2019.

were taken over by the Russian Empire in the late XVIII century, helps take account of specific cultural and institutional legacies and patterns of peasant-landlord relationships in this region.

This model is estimated with either plain OLS or negative binomial regression, given that the dependent variable is a raw count. Their comparison will provide additional validation of my results. My identification strategy rests on controlling for variables that could potentially be a source of omitted variable bias. The inclusion of district fixed effects in some specifications is able to remove any biases caused by time-invariant factors, and I also reinforce them with some time-varying controls.

Reverse causation, more specifically, the effect of unrest on industrialization or the share of allotment land is unlikely to be of much significance. It is possible to imagine that simmering tensions and recurrent disturbances might have worsened the investment climate in a given area and impede the building of new factories, but given both the limited intensity of unrest and industrialization at the district level in this period, its influence should have been minuscule. First, it should not have had any impact on industries located in the urban areas, which usually were not affected by peasant disturbances. Second, my data and existing sources on industrial location[9] show that such factors as proximity to output markets and input sources, communication routes and a skilled labor force (or cheap unskilled labor force in the countryside), including apparent agglomeration effects, and in some cases military-strategic considerations, were overriding concerns for investors. Rural factories could diversify the composition of the labor force, attracting migrant workers from other localities.

As my Poltava-Kharkov case study shows, even a large-scale uprising did not prevent the owners of the targeted estate in the Poltava province from building the planned

[9]See the special section "Description and Classification of Industries by Input Type" of this chapter, which precedes regression tables and figures.

sugar refinery, which was almost immediately attacked by peasants during the 1905 unrest. Attacks of this kind were rare and unable to incur lasting damage to industrial activities in the area, at least until the 1905–1907 events.

Similarly, the amount of allotment land depended on the initial deal struck between the peasants and the landlord in accordance with the official allotment norms, as well as opportunities for land expansion, including land endowment from state reserves, which, however, took place only in some sparsely populated areas (see footnote 10). As a result of disturbances, land disputes could be resolved in favor of either part of the conflict, which could lead to changes in land status and correction of the allotment land share in the official statistics between 1877 and 1905, but there is no evidence that such things happened on a significant scale. As I have demonstrated, the state took much effort, largely successful, to prevent the shrinking of the allotment land, but was unwilling to expand communal allotment holdings at the expense of private land.

The presence of omitted time-varying factors might be more plausible. Most realistically, these factors could be other aspects of modernization closely intertwined and even caused by industrialization, e.g. growing literacy or more intensive communications. The latter is partly grasped by the inclusion of railroad density. See also footnote 10 for the discussion of this issue with respect to the allotment land. In order to account for autocorrelation within districts across years, I use cluster-robust standard errors (Angrist and Pischke 2008). Given a probable diffusion of unrest across district borders, and otherwise unaccounted for shocks affecting several nearby districts, I use spatial lag and spatial error autocorrelation models in robustness check specifications.

That said, I tend to cautiously interpret my results in this chapter as descriptive by default, but they may still provide a valuable insight into the nature of the studied phenomena. Overall consistency of these results with my theoretical expectations and the findings of the Kursk province case study below lends support to their causal interpre-

tation.

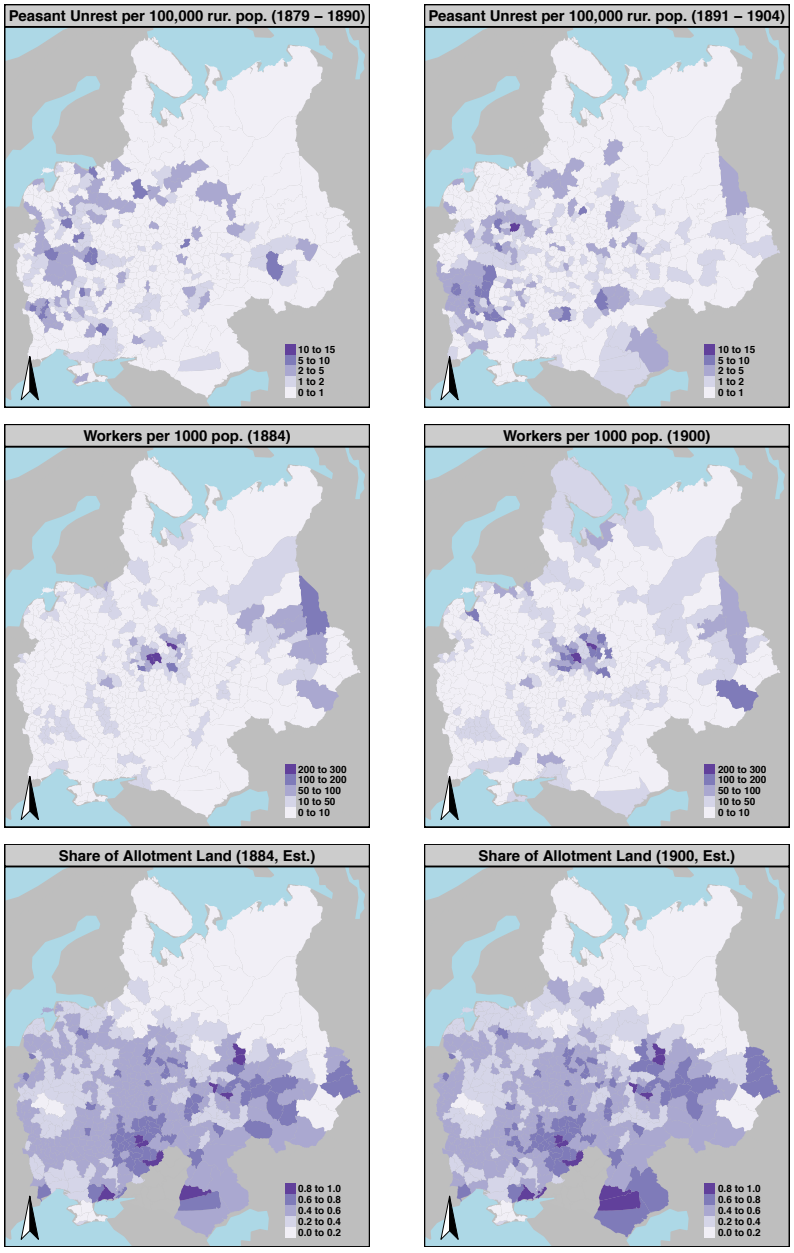

Figure 4.1: Maps of the spatial distribution of unrest (first row; total number of cases normalized by rural population in 1879–1890 and 1891–1904), industrialization (second row: workers normalized by population in 1884 and 1900), and projected share of allotment land (third row, in 1884 and 1900). Sources: Table 4.3, author's calculations.

Spatial distribution of the main dependent and independent variables and their binary relations are provided in Figure 4.1. The juxtaposition of the maps reveals several important patterns. Industrial development was concentrated in a limited number of districts, mostly in the old industrial areas (Moscow and its surroundings, Saint-Petersburg, Urals), while the majority remained stagnant or even in outright decline. The only new industrial region which started to emerge since the 1870s is Donetsk (Yuzovka)–Krivoy Rog coal and iron mining and metallurgical area in East Ukraine. We can see a certain negative association between the industrial development and unrest: the most industrialized areas, especially in the center, did not see much peasant unrest, while more backward Western parts (e.g. the Minsk province or Bessarabia) or the Volga territories were particularly conflict-ridden. At the same time, there seems to be a strong negative association of unrest with the share of allotment land.

Figure 4.2, depicting binary relationships between the main variables of interest, partly supports this intuition: the first row shows that after a certain level of industrialization there is a weak negative tendency towards reduction of unrest (it would seem stronger had I used non-logged and non-winsorized data, but to a large extent it would have been driven by a handful of most developed and peaceful regions). The negative correlation of unrest and allotment land share seems to be somewhat stronger, but also after a certain level of land ownership disparity. Plotting binary relationships, we fail to discover a strong correlation between the variables of interest, at least any clear-cut linear relationship. The linear trend lines plotted are virtually flat and indistinguishable from the bottom congestion of points.

The results of the regression analysis are discussed below. The total number of workers (population-normalized) is not significantly related to unrest, and the signs of the coefficients are inconsistent across models: they are negative in two-way fixed effects and negative binomial models, but positive in OLS with only year effects (Table 4.4).

The coefficient on the share of allotment land is everywhere negative, as expected, but it loses significance when district fixed effects are added (Models (8) and (9)). Interpreting this result, we should keep in mind that the share of allotment land is relatively stable across time, and most of its variation is between, rather than within districts[10] (see Figure 4.1), therefore dealing with within-district effects may conceal the most important part of the variation.

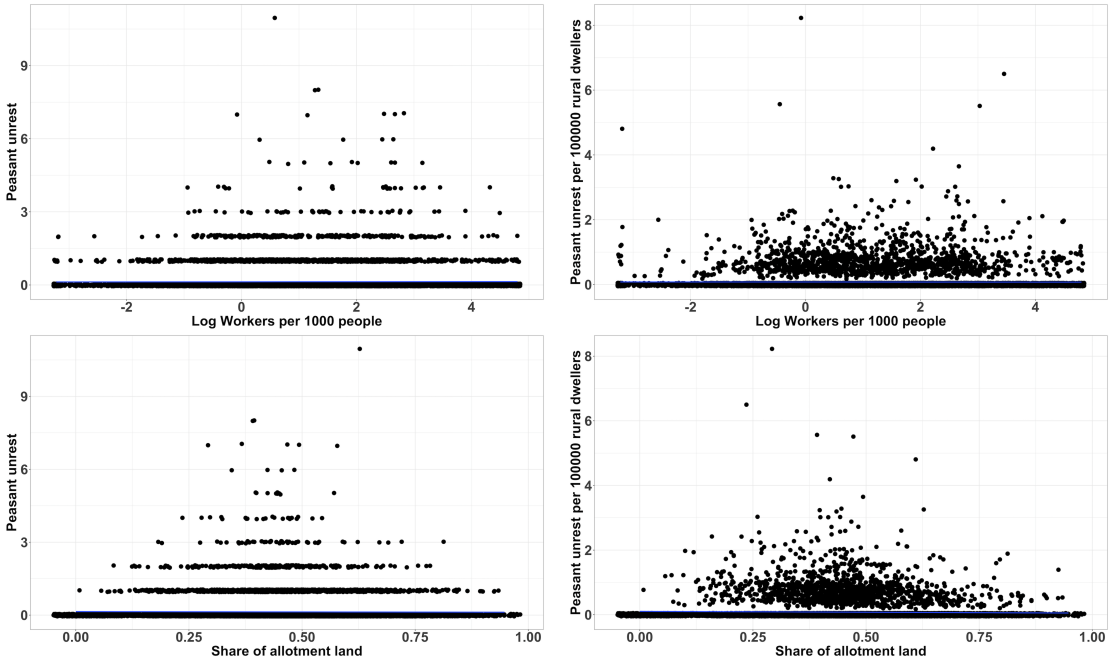

Figure 4.2: Yearly district-level panel data, 1879–1904: scatterplots of winsorized log workers normalized by population, share of allotment land and peasant unrest (number of cases in a district-year: absolute and normalized by population).

Figure 4.3, derived from Table 4.5, introduces the interaction of land inequality and the level of industrialization. The coefficients on the number of workers are insignificant in all specifications, and positive only in linear models with year effects (Models (5) and (6)). As before, the coefficient on the share of allotment land is always negative, and

[10]The ratio of between to within variation is 1566.

becomes insignificant in the presence of both time and unit effects. Their interaction is always positive and significant in half of the specifications, most notably if two-way fixed effects are used (Models (7) and (8)). This result lends some support to my intuition regarding the overall moderating role of industrialization with respect to the association between inequality and rural conflict. Higher industrial development in general seems to be associated with a lower correlation of allotment land share and unrest.

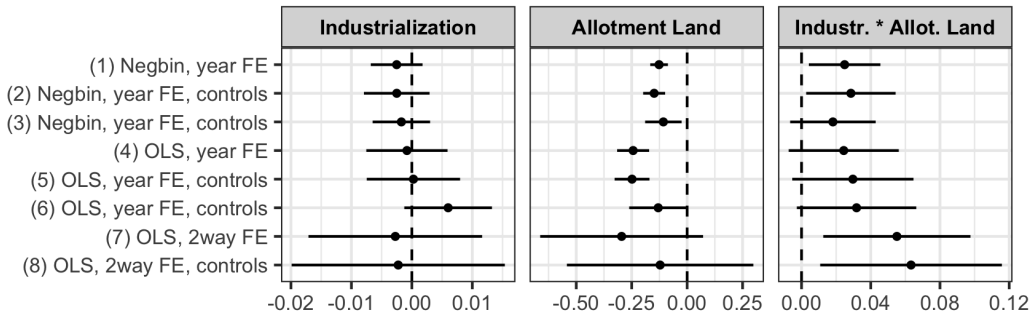

Figure 4.3: 1879–1904 peasant unrest in the European part of the Russian Empire, district-level yearly panel regression results by models and coefficients. The dependent variable is the number of conflict events in the district-year. "Industrialization": logarithm of industrial workers per 1000 people in the district; "Allotment land": share of allotment land in the district. "Industr.*Allot. Land": their interaction. Models (2) and (5) include only time-variant controls, whereas Models (3) and (6) include the full set of controls. 95% confidence intervals are shown. Full regression output is in Table 4.5 .

It makes sense to briefly discuss the coefficients on the control variables. My main focus will be on Models (3) and (6) from Table 4.5. The association with the population is positive and significant in all specifications, which is fully expected: more people lead to a greater number of registered unrest cases. Conversely, the district area bears a negative relationship, which may reflect a lower density of the population and less frequent and intensive interactions (note that the rural population is controlled for in all the specifications). The distance to Moscow is positively associated with unrest, which is reasonable if we assume that policing capacity and surveillance ability weaken as we move away from the largest Imperial city. A similar logic may explain negative and significant coefficients for the presence of the provincial capital in the district. However,

the distance coefficient for Saint-Petersburg is negative and significant, which means that another channel, for example, the influence of a more educated and less conservative urban milieu, might have been at work.

A strong positive relationship with the historical prevalence of serfdom is quite logical: the memories of oppressive relationships and dissatisfaction with the post-emancipation land division, responsible for persistent dependence of peasants on local landowners, could raise the level of discontent (see also Finkel, Gehlbach and Kofanov 2017). Higher soil fertility has a predictably positive sign (there is something to compete for), but is insignificant. Other geographical determinants are also insignificant. The signs of coefficients on weather fluctuations are inconsistent, but in the two cases when they are significant, they are negative, which goes against my expectations. On the other hand, we know that massive weather-induced harvest failures, especially the one that caused 1892 famine, were not necessarily accompanied by greater unrest. The coefficient on the railway density is negative in absence of fixed effects, but turns positive (yet insignificant) when they are added. As was mentioned above, improved mobility and communication could be a double-edged sword as far as the occurrence and prevention or suppression of conflict is concerned.

Marginal effects of allotment land share as a function of the level of industrialization, along with subsample binning estimators (Hainmueller, Mummolo and Xu 2019), are plotted in Figure 4.4 (despite using the word "effect", I am still cautious about the causal interpretation of the coefficients). The left part is derived from Model (6) of Figure 4.3 and Table 4.5, which is the most demanding linear model in absence of district fixed effects. It can be seen that the marginal effect of land inequality is negative and significant in the most backward regions, but it diminishes in absolute value with industrialization (from about -0.27 to almost zero), and turns insignificant at above-average levels of industrial development. It means that one standard deviation increase in the

share of allotment land is associated with an increase in peasant unrest of about 9% of its standard deviation (or about 1/3 of its mean) for the least industrialized districts, and is virtually unrelated to it in the most industrialized areas.

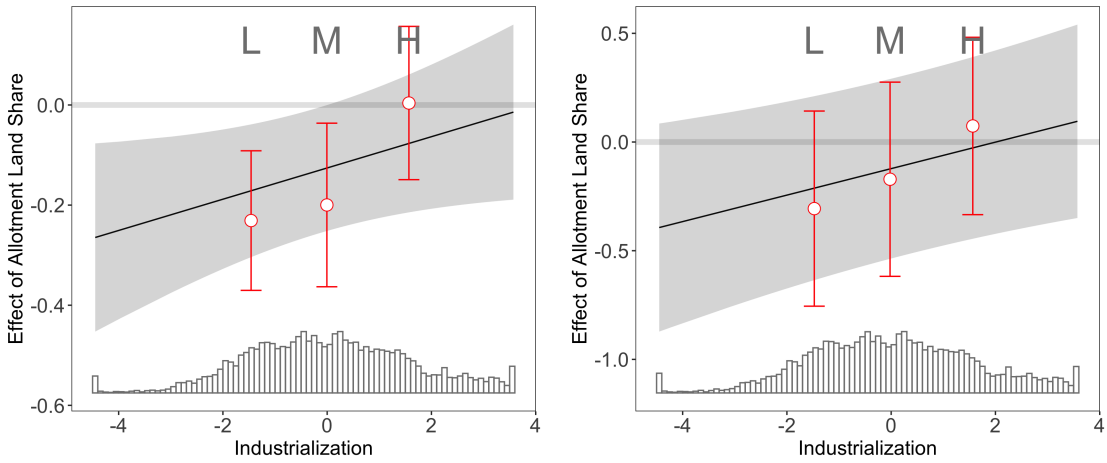

Figure 4.4: Marginal effects of the share of allotment land on unrest at different values of the log number of workers normalized by population: linear and binning estimator (Hainmueller, Mummolo and Xu 2019). L, M, and H refer to low, medium, and high values of industrialization. Models (6) (left) and (8) (right) of Figure 4.3 and Table 4.5. 95% confidence bands.

The three estimates of the binning estimator, computed at low, medium and high values of industrialization, confirm a monotonic increase of the marginal effect, although there might be some non-linearities: the first and the second bin estimates fall within each other's confidence bands, but both are statistically distinguishable from the last level. This contrast is perhaps not surprising given a strong concentration of industrial employment and output at the upper end of the distribution. The right panel corresponds to Model (8), which includes both year and district fixed effects: it reveals the same tendencies, but the confidence bands are much wider and make the marginal effects insignificant. However, as explained above, interpreting these results, we should take into account the lack of temporal variation of the share of allotment land: the interaction coefficient itself is statistically significant, but the coefficient on inequality is very

imprecisely estimated.

This intuition is mostly supported by the results of a breakdown by industries presented in Figure 4.5, which plots the main findings from Tables 4.7 and 4.8. Appendix 2 explains the classification of industries used in this paper and their properties relevant for the effect on local peasant agriculture. Table 4.18 contains the classification of the eight major groups with respect to whether their material inputs are locally or externally sourced and whether these inputs are provided by or used in local agriculture. The available information does not allow me to construct a rigorous quantitative index of the character and amount of input sources or create a respective integral measure for manufacturing as a whole at the district level, but it is possible to provide an approximate classification of industries. My argument is that in the case of the industries mainly dependent on locally sourced agricultural raw materials, such as food and wood processing (forests are treated as an agricultural input, given their importance in the peasant economy), the resource competition channel is more likely to prevail, whereas for the externally sourced industries in the bottom row, namely animal products, textiles, chemicals and machinery, the net effect may be dominated by the labor absorption mechanism.

The results plotted in Figure 4.5[11] display an uneven picture, but to a considerable extent support my theoretical intuition. The starkest contrast can be found between the food and the textile industries, which, as we saw above (Figure 4.11), were the two single largest industries, which together constituted the bulk of industrial employment and output. The coefficient on the food industry, which fits the description above (sugar refineries and distilleries are a prominent example to be considered below) is consistently positive (yet insignificant in the two-way FE specification), whereas its interaction with allotment land share is always negative (but insignificant). At the same time, the spread

[11] I do not separately consider the metallurgy industry, which was concentrated in a handful of districts.

of the textile industry, which in the case of European Russia did not rely on locally sourced raw materials, is always negatively and significantly associated with unrest, while its interaction with land inequality is positive and turns significant when I add district fixed effects.

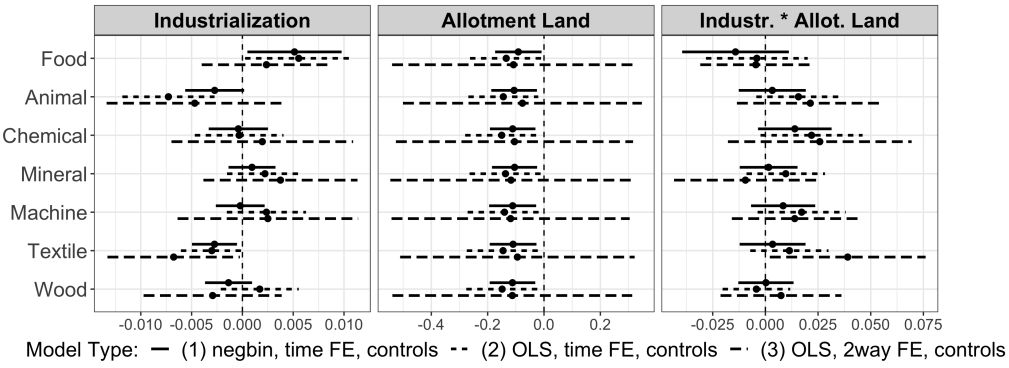

Figure 4.5: 1879–1904 peasant unrest in the European part of the Russian Empire, district-level yearly panel regression results by industry type and coefficients. The dependent variable is the number of disturbances in the district-year. "Industrialization": logarithm of industrial workers per 1000 people in the district; "Allotment land": share of allotment land in the district. "Industr.*Allot. Land": their interaction. Full regression output is in Tables 4.7 and 4.8. 95% confidence intervals are shown.

The same pattern is pronounced in the case of animal (non-food) processing, which was also to a large extent externally sourced. Interestingly, however, in the case of the wood industry we do not see such a strong tendency toward a positive effect and a negative interaction, which appears only when we consider OLS with the full set of controls and year fixed effects. The explanation of the coefficients on chemical and machinery industries is less intuitive, but their interactions with land inequality are always positive, in line with the theoretical predictions and in contrast to the food industry interaction. All the coefficients for these industries, however, are never significant. The coefficients on the mineral industry are as well not significant, but positive, whereas the interactions are negative for the negative binomial and two-way fixed effects models, which is potentially explainable by its interim position with regards to the input sources and the

relative role of causal channels.

In order to further explore the role of different industries, I estimate models for various types of industry and unrest. The results can be seen on Figure 4.10, which includes least squares panel estimates with the full battery of controls and time effects (the left column), as well as two-way fixed effects models with time-variant controls (the right column). Given a substantial number of possible models corresponding to the combinations of seven industries and six types of unrest, I plot only the information on the sign of the coefficient (red color denotes positive, and blue color stands for negative) and its significance at the 5% level (marked by a black dot).

My conclusions mostly hold for the coefficient on industrialization: when I use only time effects, it is almost always positive for the food industry and negative for textiles, but significant only in the case of all property-related or only land-related unrest, which is logical, given that the development of the food industry lead to direct competition over land resources. It is also not unexpected that for the wood industry there is a significant coefficient on non-land property (forest-related conflicts fall into this category). The inclusion of fixed effects makes the food industry coefficients insignificant. The positive and significant association of political and social disturbances with textiles may reflect the better organization and education of that industry's workers.

However, somewhat counterintuitively, the interaction coefficients for the food industry are almost always positive, but, as for the textiles and most other industries and unrest types, are insignificant. Positive and significant interaction makes sense for the chemical and mineral industries, and it mostly concerns land-related unrest. Coefficients on the share of allotment land are predominantly negative, which is consistent with the theory, but surprisingly significant only for non-land property and tax and debt-related unrest. Given that attacks on non-land property were still related to land conflicts, and the weight of tax burden also depended on the amount of land at the peas-

ants' disposal it is not wholly illogical, but it is remarkable that there is no significant relationship with directly land-related disturbances.

These results partly support my intuition, however, they should not be overinterpreted given the multiplicity of tested hypotheses and the fact that breaking total unrest into categories may increase the noisiness of the estimates due to dealing with increasingly rare events. Similarly, results for the aggregate industry (Figure 4.9) are more or less reproduced for the largest categories of unrest (all the property and land property), which can be caused both by the salience of land and the greater prevalence of such events.

The findings presented in this section are not fully robust to the application of alternative methods and specifications. Getting back to the aggregate industry estimates, in Table 4.9 I add a time lag of the dependent variable: the value of the unrest variable in the previous year. The picture is somewhat changed: all the coefficients on the variables of interest keep their signs, but in Model (6) the allotment land share and its interaction with industrialization are significant only at the 10% level. The estimation of spatial lag models, accounting for the possibility of unrest spillover across the district borders (Table 4.11), displays a similar picture. District fixed effects and especially temporally lagged peasant unrest considerably weaken the results, making all the coefficients of the main independent variables insignificant.

Given that the focus of my theoretical and empirical conceptualization of land inequality is on the peasant communal landholding, it might be useful to consider an alternative indicator, which also includes land acquired by peasant communes, officially treated as private land (even though owned collectively), which was not subjected to sale restrictions. The communes had the right to purchase additional land, and assuming that it was fairly distributed among its members, it could play the same role as the allotment land. As mentioned above, privately purchased communal land made up only

a small share of communal land or all peasant purchases. Much more typical was land acquisition by individuals or groups of peasants (not necessarily consisting of locals), which, however, was more likely to exacerbate within-commune inequality, benefiting richer peasants. There is a possibility, however, that the communes which bought land were also not among the poorest ones, but rather the most well-off.

Table 4.12 presents estimates of negative binomial and OLS models with the full set of controls and two-way FE panels with time-variant controls, that were used in Tables 4.5, 4.7, and 4.8, with the share of allotment land replaced by the share of total communal land: allotment land plus land bought by communes on private terms. I use aggregate industrialization and textile and food branches as independent variables. We can see that similarly to the share of allotment land the coefficients on communal land are always negative, but somewhat less significant. It should be noted that this indicator to a larger extent depends on peasants' decisions, which makes him more plausibly endogenous. The signs of the interactions and industrialization coefficients are the same. Overall, replacement of allotment land with total communally owned land does not make much difference.

In this context, it would be also instructive to examine the association of peasant unrest with the total amount of land owned by peasants both on communal and private terms. Table 4.13 includes the same models as the previous one, but with the share of total peasant-owned land instead of communal land. Interestingly, the results are also in line with what we saw for allotment land, but with a certain loss in significance. The signs of the peasant land coefficients are always negative, and the signs of interactions remain almost always the same.

Comparing the results for the total peasant and communal land with the inclusion of allotment land, we can see that they are broadly similar. It might be not surprising, given that even in 1905 allotment land constituted the lion's share of all peasant holdings, and

these measures are necessarily strongly correlated. Yet, it is notable that the relationship between unrest and the share of allotment land seems to be the most robust. I interpret this finding as illustrative of the centrality of the share of allotment land, which was inalienable and aimed at guaranteeing a certain minimum landholding to peasants.

Although my focus is on the distribution of land between peasants and other owners, it makes sense to consider other aspects of land inequality, namely the available measures of inter-communal (unfortunately, within-communal inequality is unknown) and private land distribution. Table 4.14 shows the estimation results of OLS models with year fixed effects only, which allows the inclusion of time-invariant controls. We can see that the results are weakened: the coefficients on allotment and communal land lose significance and even cease to be significant in models (1) and (4), which include total industrial employment. Remarkably, though, the coefficient on allotment and private land Gini coefficients are themselves not significant, and the within r-squared is not much changed, so that the importance of these indicators might have been limited. Therefore it is not clear to what extent the lack of significance of my main land inequality measures can be a consequence of the inclusion of omitted factors or just multicollinearity inflating standard errors. The correlations between the share of allotment and communal land and allotment and private land Gini coefficients are -0.49 and 0.23 respectively (the same measures for the share of total communal land are -0.47 and 0.23).

As an alternative to the separate consideration of different industries, we can turn to geographic regions with varying socio-economic profiles (Figure 4.7). The results for my baseline models are displayed in Tables 4.15 and 4.16. If we consider the models with only controls and year effects, we can see the pattern of a negative relationship with allotment land share and its positive interaction with land inequality in the Belarus/Lithuania and Ukraine/Don/Bessarabia regions, despite their relatively agrarian profiles. At the same time in the case of Ukraine, with its developed sugar refining in-

dustry and sugar beet cultivation, the magnitude of the interaction coefficient is much smaller. For the agrarian Central Black Soil area the interaction is negative, but insignificant. It is negative and significant for the provinces situated along the Volga river, which was known for repeated droughts and harsh conflicts between peasants and landlords. However, the inclusion of district fixed effects makes most of these results insignificant. In the case of Belarus, the interaction remains significant at the 10% level, and its sign is changed to negative.

Table 4.17 demonstrates that using an approximately estimated number of affected villages and the number of "large" disturbances (those affecting more than one village, parish or district) as the dependent variable, brings similar results for the baseline specifications. Lastly, Figure 4.9 plots results by various types of peasant unrest. It can be seen that they are broadly in line with the previous results, especially for the encroachments on property and specifically land property, which are the largest categories.

The last validity check of my results is the power analysis of the regression coefficients from the core models of this chapter. Of particular interest is the interaction coefficients, which require more observations for the same level of statistical power as the main effect. It should be stressed that a retrospective, or *post-hoc*, power analysis is necessarily of more limited value than a prospective one. For statistically significant coefficients, the calculated observed power (that can be presented as a decreasing function of the p-value) would be larger than for those not satisfying statistical significance criteria (Hoenig and Heisey 2001).[12] Although we cannot infer the statistical power of a study solely from its results, it is possible to make a quasi-prospective analysis by finding sample sizes corresponding to different hypothetical effect sizes at a given power

[12]As noted in Fraley and Vazire 2014, "This *post hoc* or "observed" approach to computing power has been criticized by methodologists because observed effect sizes and sample sizes tend to be strongly negatively correlated in research literatures... As a result, small-N studies that actually produce significant results tend to report larger effect sizes than comparable large-N studies, thereby biasing their observed power estimates upwards..." (p. 6).

level.

Table 4.1: Power Analysis for Interactions of Industrialization and Land Inequality

	Total Industry		Food Industry		Textile Industry	
	Year Eff.	Two-way	Year Eff.	Two-way	Year Eff.	Two-way
r (interaction)	0.016	0.023	-0.003	-0.004	0.014	0.049
p-value	0.063	0.042	0.729	0.640	0.220	0.032
Actual N	12,558	12,740	12,558	12,740	12,558	12,740
N est.	31,494	11,063	1,020,305	782,791	38,823	3,247
N est. (2*Effect)	7,871	2,763	255,074	195,695	9,703	809
N est. (0.5*Effect)	125,987	44,260	4,081,231	3,131,174	155,302	12,997
Power est.	0.7983	0.7694	0.0783	0.0916	0.396	0.1239

Notes: First row: the estimated size of the effect of the interaction between a measure of industrialization (log number of workers per 1,000 people) and the share of allotment land in the corresponding regression models. *Second row:* the *p*-values of the estimated interaction coefficients. *Third row:* the actual number of observations in the corresponding model. *Fourth row:* an estimate of the required number of observations in order to achieve an 80% power level at the 5% level of statistical significance for the interaction. *Fifth row:* same if the actual effect is twice an estimated effect. *Sixth row:* same if the actual effect is half of an estimated effect. *Seventh row:* retrospective bootstrap estimates of the power level of the interaction from a given model. *Total Industry columns:* Models (6) and (8) from Table 4.5; *Food Industry columns:* Models (2) and (3) from Table 4.7; *Textile Industry columns:* Models (5) and (6) from Table 4.8. The bootstrap power estimates are based on 10,000 iterations and the 5% level of statistical significance. All the variables are standardized.

Table 4.1 displays the results of the power calculation with respect to the interaction between industrialization and land inequality (the share of allotment land). The first three rows contain the actual value of the interaction coefficient (partial correlation of standardized variables) in a respective model, its *p*-value, and the actual sample size. In the next three rows I provide the estimated sample sizes necessary for 80% power at a 5% significance level for different effect values.[13] It can be seen that when I use the estimated value of the effect, the actual sample (the third row) exceeds the required sample for coefficients significant at the 5% level (see the fourth row) only for two-way FE models for the total industry and textiles, but is far lower otherwise.

Given that the actual effect is unknown, and there are no *ex-ante* expectations regard-

[13]The sample sizes were calculated using the *pwr.r.test* function from the R package *pwr*. All the variables included in the regressions were standardized, which does not affect the significance of coefficients, but transforms them into partial correlation coefficients, which can be directly used in the power calculation.

ing its size, my approach will inevitably be somewhat arbitrary. I consider what sample size will be needed in order to detect the true effect with 80% power if it is two times (the fifth row) or one half (the sixth row) as large as the observed coefficient. For the models with significant coefficients, obviously, a larger effect corresponds to a smaller sample, but decreasing the effect by half requires a larger sample than I use. Except for the case of the textile industry, for the models with insignificant interactions the situation is not much improved when the hypothetical effect is twice the observed one.[14]

For the sake of comparison, given that we are dealing with multivariate models, in the last row I also provide retrospective bootstrap power estimates using the original sample and keeping its size (the third row). The procedure performs random permutations of the actual dataset observations with replacement and estimates the percentage of simulated samples which bring significant (at the 5% level) interaction coefficients. The results reveal a close to 80% estimate for the aggregate industry models, but, surprisingly, a very low power for the interaction of textiles with land inequality in the two-way FE model (the last column).

The main takeaway of this analysis is that within a more or less reasonable range of the unobservable interaction effect sizes based on the actual observed coefficients (in the absence of more solid theoretical expectations), we are not always sufficiently powered to reject the null hypothesis of no interaction effect when the alternative hypothesis is true. It can be seen that even the model in the first column (the subject of a marginal effects analysis above), which is a model that reveals a significant economic effect of industrialization on the association between unrest and land inequality in the least industrialized regions, can potentially suffer from this problem. Consequently, I do not

[14]It can be seen that for the food industry the required sample sizes are enormous, surpassing one and four million observations for the original effect and half its size, respectively. This happens because the effect is extremely low (r can take values from -1 to 1), and the required sample size seems to grow hyperbolically at such levels.

exclude the limited sample size as one of the explanations of the lack of the ability to find consistently significant interactions.

4.4 Conclusion

To sum up, my district-level analysis provides qualified support for the formulated hypotheses, and the results are sensitive to the choice of specification. Land inequality is associated with more unrest, although less significantly if different types of unrest are dealt with. Aggregate industrial development leads to a weaker association with allotment land share, which may reflect the greater importance of the labor absorption channel in comparison to the resource competition channel, but its links with unrest are less straightforward. In more developed regions, depending on the industrial structure, we can observe more or less unrest, and the land inequality between communal allotment and private holdings may be more or less important in that respect. In line with the theoretical predictions, the food industry may be particularly conflict-provoking, whereas the development of textiles could have the opposite effect.

The presence of district fixed effects in the models, however, in most cases significantly decreases the precision of my estimates. It is remarkable that we do not see within districts a strong association between industrial growth and the intensity of peasant unrest (with a notable exception of textiles and for some types of unrest, animal and mineral production). This finding somewhat blurs the dynamic aspect of my narrative, and makes it harder to explain the simultaneous growth of industry and rural conflict. Moreover, the inclusion of lagged unrest or accounting for spatial diffusion and correlation further weakens my results.

Interpreting the fact that statistical association between peasant unrest and industrialization is relatively weak, we should keep in mind the geographically concentrated

nature of industrial growth, which leads to the prevalence of *between* over *within* variation (even if less pronounced than in the case of allotment land), and especially compromises results in the models containing district fixed effects.[15] This fact speaks to the point that the predominance of the cross-district variation in industrialization makes it a better explanatory factor of the observed patterns of unrest in the Russian Empire, and the usage of a pooled panel with time effects may be quite relevant. My quantitative case study of the 1905–1906 unrest in the Kursk province, presented in the next chapter, provides a stronger case of positive association between the location of food industry and peasant unrest in the cross-sectional context.

[15]The ratio of between to within variation ranges from about 66 for the chemical industry to 175.5 for textiles (for any industry excluding textiles it is less than 100). For the total amount of workers normalized by population this ratio is 202. For comparison it is 3.3 for the peasant unrest.

4.5 European Russia District-Level Analysis: Tables and Figures

Table 4.2: Variable Summary, European Russian Empire, Panel District-Level Analysis

Statistic	N	Mean	St. Dev.	Min	Max
Num. peasant disturbances in a district-year	13,026	0.13	0.49	0	11
Num. large peasant disturbances in a district-year	13,026	0.03	0.18	0	3
Num. villages with disturbances in a district-year	13,026	0.18	1.00	0	46
Num. agricultural worker disturbances in a district-year	13,026	0.00	0.05	0	2
Num. political/social peasant disturbances in a district-year	13,026	0.00	0.04	0	2
Num. tax/debt peasant disturbances in a district-year	13,026	0.02	0.15	0	2
Num. property-related peasant disturbances in a district-year	13,026	0.09	0.43	0	11
Num. land-related peasant disturbances in a district-year	13,026	0.08	0.38	0	10
Num. non-land property-related peasant disturbances in a district-year	13,026	0.02	0.18	0	6
Num. resistance peasant disturbances in a district-year	13,026	0.06	0.28	0	5
Num. violent peasant disturbances in a district-year	13,026	0.02	0.15	0	3
Num. property destruction/arson peasant disturbances in a district-year	13,026	0.01	0.15	0	6
Log workers per capita, demeaned	13,026	−0.00	1.63	−4.78	3.59
Log urban workers per capita, demeaned	13,026	−0.00	2.58	−4.72	4.72
Log rural workers per capita, demeaned	13,026	−0.00	1.89	−6.90	3.95
Log food workers per capita, demeaned	13,026	0.00	2.16	−6.02	3.42
Log animal workers per capita, demeaned	13,026	−0.00	2.71	−3.10	5.31
Log chemical workers per capita, demeaned	13,026	−0.00	2.77	−1.99	6.92
Log mineral workers per capita, demeaned	13,026	0.00	3.17	−3.33	6.25
Log machinery workers per capita, demeaned	13,026	0.00	3.19	−2.64	7.25
Log textile workers per capita, demeaned	13,026	0.00	3.82	−2.91	8.76
Log wood workers per capita, demeaned	13,026	0.00	3.11	−3.25	5.83
Share of allotment land, demeaned	12,766	−0.00	0.16	−0.46	0.49
Share of communal land, demeaned	12,766	−0.00	0.17	−0.47	0.48
Share of peasant land, demeaned	12,766	−0.00	0.17	−0.52	0.44
Allotment land Gini, 1905	12,272	0.49	0.16	0.00	0.90
Private land Gini, 1905	12,506	0.77	0.14	0.00	0.98
Spring temperature deviation	13,000	0.00	1.63	−6.67	5.06
Summer precipitation deviation	13,000	0.26	2.27	−6.42	8.80
Railway density	13,026	0.02	0.02	0	0
Serf share in 1858	12,740	38.56	24.88	0.00	85.21
Fertile soil	13,000	0.45	0.39	0.00	1.00
Forest share, 1881	12,974	0.28	0.20	0.00	0.98
Terrain ruggedness	13,000	91.29	4.94	39.60	99.52
River density	13,000	16.48	7.82	0.00	53.78
Province capital in district	13,000	0.10	0.30	0.00	1.00
Distance to Moscow	13,000	64.13	32.32	0.92	170.63
Distance to Saint Petersburg	13,000	101.71	45.53	0.00	221.87
Former Poland-Lithuania territory	13,000	0.14	0.35	0.00	1.00
Log district area	13,026	22.48	0.82	20.98	26.52
Log rural population	13,026	11.82	0.54	8.73	13.29

Table 4.3: Variables Summary. European Russian Empire. Panel District-Level Analysis

Variable	Description	Source
Number of peasant disturbances	Count of peasant unrest events in a district-year, 1879–1904 and 1908–1913	Chronicles of peasant movement: Nifontov and Zlatoustovskii 1960, Shapkarin 1959, Anfimov 1998, Shapkarin 1966, Zaionchkovskii 1968, Ivanov 1964. Author's coding and calculations.
Number of large peasant disturbances	Count of large (occuring in more than one village, parish or district) peasant unrest events in a district-year, 1879–1904	
Number of villages with disturbances	Count of villages affected by unrest in a district-year, 1879–1904	
Number of villages agricultural worker disturbances in a district-year	Count of agricultural worker unrest events in a district-year	
Number of villages political/-social peasant disturbances in a district-year	Same, for for political/social unrest	
Number of villages tax/debt peasant disturbances in a district-year	Same, for tax/debt-related unrest	
Number of villages property-related peasant disturbances in a district-year	Same, for unrest related all sorts of property	
Number of villages land-related peasant disturbances in a district-year	Same, for land-related unrest	
Number of villages non-land property-related peasant disturbances in a district-year	Same, for non-land property-related unrest	

continued on the next page

Table 4.3: Variables Summary. European Russian Empire. Panel District-Level Analysis (continued)

Variable	Description	Source
Number of villages resistance peasant disturbances in a district-year	Same, for unrest events involving resistance to the authorities or landowners and their employees	
Number of villages violent peasant disturbances in a district-year	Same, for unrest events involving violent clashes with the authorities or landowners and their employees	
Number of villages property destruction/arson peasant disturbances in a district-year	Same, for unrest events involving property destruction and/or arson	
Log workers per 1000 people, demeaned	Logarithm of the number of workers per 1000 people (Box-Cox transformed: to the value of each observation added half of the minimum of the non-zero values of the variable before taking logarithm), demeaned and winsorized at 1%. The original values for the number of workers are for 1879, 1884, 1890, 1894, 1900, and 1908; the values for remaining years are linearly interpolated.	District-level data is the aggregation of the enterprise-level data on the number of workers from the lists of enterprises. Manufacturing industry by years: 1879: Orlov 1881, 1884: Orlov 1887, 1890: Orlov and Budagov 1894, 1894: Ministry of Finance. Department of Trade and Manufactories 1897, 1900: Ministry of Finance. Department of Trade and Manufactories 1903, 1908: Varzar 1912. Metallurgy: 1879: *Obzor ... gubernii za ... god. Prilozheniie k vsepoddaneishomu otchetu ... gubernatora*, various provinces and years. 1884, 1890, 1894, 1900, 1907 (due to data unavailability, 1907 values are taken instead of 1908): Gornyi Uchenyi Komitet 1886, 1892, 1896, 1903, 1910. Population data (interpolated to get a
Log urban workers per 1000 people, demeaned	Logarithm of the number of urban workers per 1000 urban dwellers…	
Log rural workers per 1000 people, demeaned	Logarithm of the number of rural workers per 1000 rural dwellers…	
Log food workers per 1000 people, demeaned	Logarithm of the number of workers employed in the food industry per 1000 people…	

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Table 4.3: Variables Summary. European Russian Empire. Panel District-Level Analysis (continued)

Variable	Description	Source
Log animal workers per 1000 people, demeaned	Logarithm of the number of workers employed in the animal processing industry per 1000 people…	continuous variable): 1863: TsSK MVD 1866, 1883: TsSK MVD 1886, 1892: Suvorin 1895, 1904 and 1908: TsSK MVD 1905, 1909 for 1904 and 1908.
Log chemical workers per 1000 people, demeaned	Logarithm of the number of workers employed in the chemical industry per 1000 people…	
Log machinery workers per 1000 people, demeaned	Logarithm of the number of workers employed in the machinery industry per 1000 people…	
Log textile workers per 1000 people, demeaned	Logarithm of the number of workers employed in the textile industry per 1000 people…	
Log wood workers per 1000 people, demeaned	Logarithm of the number of workers employed in the wood processing industry per 1000 people…	
Share of allotment land, demeaned	The share of allotment land in the total amount of land in the district	Tsentral'nyi Statisticheskii Komitet MVD 1905-1906, author's calculation
Share of communal land, demeaned	The share of total communal land in the total amount of land in the district	
Share of peasant land, demeaned	The share of total peasant land in the total amount of land in the district	
Allotment land Gini, 1905	Gini coefficient for allotment land in the district in 1905	Buggle and Nafziger 2017, calculated using Tsentral'nyi Statisticheskii Komitet MVD 1905-1906
Private land Gini, 1905	Gini coefficient for private land in the district in 1905	

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Table 4.3: Variables Summary. European Russian Empire. Panel District-Level Analysis (continued)

Variable	Description	Source
Spring temperature deviation	Yearly deviation of the average spring temperature (March-May) from the 1879-1908 district-level average	Global Historical Climatology Network - Monthly (GHCN-M) Version 4 (Last Updated: 05\07\2019), https://www.ncdc.noaa.gov/data-access/land-based-station-data/land-based-datasets/global-historical-climatology-network-monthly-version-4.
Summer precipitation deviation	Yearly deviation of the average summer precipitation (June-August) from the 1879-1908 district-level average	
Railway density	Railway length in the district divided by the district area (km per km^2)	"Data on railroad construction: Verkhovskoi 1899, Ministry of Transportation 1914, Afonina 1995. Railroad vector data: Made with Natural Earth. Free vector and raster map data @ naturalearthdata.com. https://www.naturalearthdata.com/downloads/10m-cultural-vectors/railroads/. Contemporary vector railroad data were matched with the information on the historically built railroad segments. It is presumed that there has been no substantial changes in their location.
Serf share in 1858	Proportion of serfs in the district population, 1858	Nafziger 2011, based on Troinitskii 1861
Fertile soil	Share of fertile soil in the district area	Buggle and Nafziger 2017, based on FAO data
Forest share, 1881	Proportion of forest in the total district land, 1881	TsSK MVD 1884, author's calculations

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Table 4.3: Variables Summary. European Russian Empire. Panel District-Level Analysis (continued)

Variable	Description	Source
Terrain ruggednes	Terrain Ruggedness Index, district-level	Buggle and Nafziger 2017
River density	River length in the district divided by the district area	
Province capital in district	Whether the province capital located in the district (0: no; 1: yes).	
Distance to Moscow	Distance from the district centroid to Moscow (in 10 km)	Calculated based on vector data: Kessler, Gijs, 2017, "Maps", http://hdl.handle.net/10622/DN9QDM, IISH Dataverse, V1. Shapefile of the 1897 Russian Empire – uezd level.
Distance to Saint Petersburg	Distance from the district centroid to Saint-Petersburg (in 10 km)	
Log district area	Log of district area (in m^2)	
Former Poland-Lithuania territory	Whether the district territory belonged to Polish-Lithuanian Commonwealth in 1770, before the first partition	Calculated based on vector data. Districts: Kessler, Gijs, 2017, "Maps", http://hdl.handle.net/10622/DN9QDM, IISH Dataverse, V1. Shapefile of the 1897 Russian Empire – uezd level. The borders of Poland-Lithuania: MPIDR [Max Planck Institute for Demographic Research] and CGG [Chair for Geodesy and Geoinformatics, University of Rostock] 2012: MPIDR Population History GIS – Rostock. https://censusmosaic.demog.berkeley.edu/data/historical-gis-files

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Table 4.3: Variables Summary. European Russian Empire. Panel District-Level Analysis (continued)

Variable	Description	Source
Log rural population	Logarithm of the rural population in the district. The original values are for 1863, 1883, 1892, 1904, 1908; the values for the remaining years are interpolated assuming a constant growth rate.	1863: TsSK MVD 1866, 1883: TsSK MVD 1886, 1892: Suvorin 1895, 1904 and 1908: TsSK MVD 1905, 1909 for 1904 and 1908.

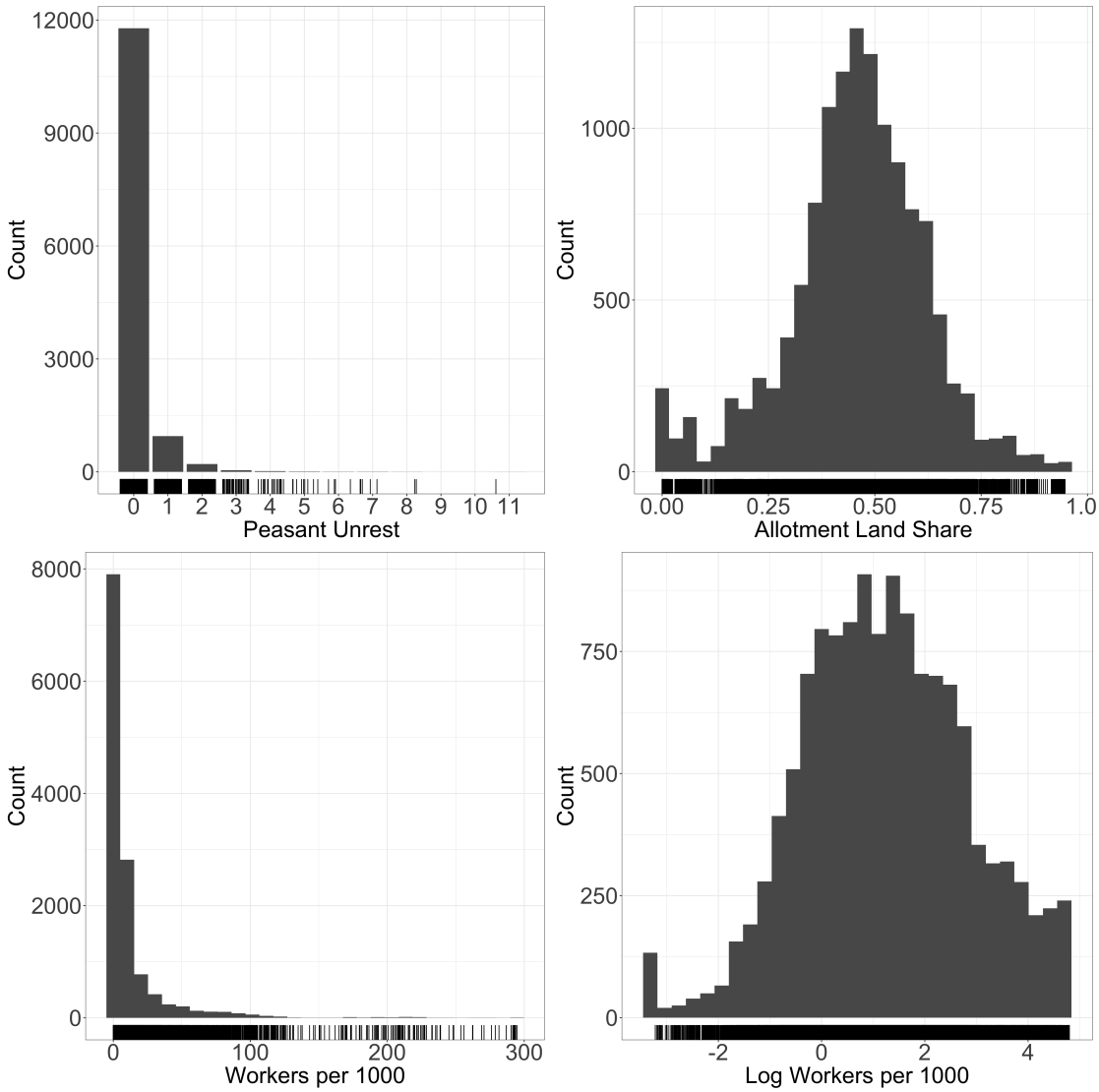

Figure 4.6: Histograms of the main variables of interest. Top left: cases of unrest in a district-year; top right: share of allotment land; bottom left: number of workers per 1000 people; bottom right: log of per capita number of workers per 1000, winsorized at the first and last percentiles.

Table 4.4: Peasant Unrest, Industrialization, and Land Inequality (1879–1904)

Dependent Variable:	Number of Peasant Disturbances in a District-Year								
	Negbin	Negbin	Negbin	OLS	OLS	OLS	OLS	OLS	OLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Log workers per 1000 people	−0.000	−0.003	−0.002	0.003	0.001	0.005	−0.004	−0.005	−0.004
	(0.003)	(0.003)	(0.002)	(0.004)	(0.004)	(0.004)	(0.008)	(0.008)	(0.009)
Share of allotment land		−0.153***	−0.112***		−0.253***	−0.144**		−0.106	−0.112
		(0.025)	(0.041)		(0.039)	(0.065)		(0.215)	(0.212)
Spring temperature deviation			0.002			−0.003			0.007
			(0.003)			(0.002)			(0.004)
Summer precipitation deviation			−0.001			0.000			−0.005**
			(0.001)			(0.002)			(0.002)
Railway density			−0.441**			−0.210			0.141
			(0.178)			(0.276)			(0.642)
Serf share in 1858			0.001***			0.002***			
			(0.000)			(0.000)			
Fertile soil			0.028			0.032			
			(0.018)			(0.028)			
Forest share, 1881			0.045			0.017			
			(0.035)			(0.057)			
Terrain ruggedness			0.001			−0.001			
			(0.001)			(0.001)			
River density			0.000			0.001			
			(0.000)			(0.001)			
Province capital in district			−0.022*			−0.049**			
			(0.013)			(0.025)			
Distance to Moscow			0.001***			0.002***			
			(0.000)			(0.000)			
Distance to Saint Petersburg			−0.000**			−0.001***			
			(0.000)			(0.000)			
Former Poland-Lithuania territory			0.014			0.037			
			(0.014)			(0.027)			
Log district area			−0.029**			−0.024			
			(0.013)			(0.016)			
Log rural population	0.118***	0.130***	0.134***	0.143***	0.176***	0.171***	0.214***	0.235***	0.235***
	(0.009)	(0.010)	(0.014)	(0.014)	(0.016)	(0.022)	(0.068)	(0.074)	(0.074)
District FE	N	N	N	N	N	N	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Num. obs.	13026	12776	12558	13026	12776	12558	13026	12776	13026
Log Likelihood	-4735.602	-4628.495	-4476.106						
Deviance	4458.785	4389.200	4432.272						
R^2				0.025	0.031	0.045	0.002	0.002	0.003
Adj. R^2				0.025	0.031	0.044	-0.040	-0.040	-0.040

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Cluster-robust standard errors in parentheses. For Models (1) - (3) partial effects for the average observation are provided in order to make them roughly comparable to OLS marginal effects.

Table 4.5: Peasant Unrest, Industrialization, and Land Inequality, with Interactions (1879–1904)

Dependent Variable:	Number of Peasant Disturbances in a District-Year							
	Negbin	Negbin	Negbin	OLS	OLS	OLS	OLS	OLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log workers per 1000 people	−0.002	−0.002	−0.002	0.001	0.000	0.006*	−0.002	−0.002
	(0.003)	(0.003)	(0.002)	(0.004)	(0.004)	(0.004)	(0.009)	(0.009)
Share of allotment land	−0.148***	−0.149***	−0.108***	−0.247***	−0.249***	−0.131**	−0.116	−0.122
	(0.024)	(0.025)	(0.041)	(0.039)	(0.039)	(0.065)	(0.213)	(0.210)
Share of allotment land*Log workers per 1000 people	0.028**	0.028**	0.018	0.028*	0.029*	0.031*	0.059**	0.061**
	(0.013)	(0.013)	(0.012)	(0.017)	(0.017)	(0.017)	(0.023)	(0.026)
Spring temperature deviation		−0.001	0.002		−0.004*	−0.003		0.007
		(0.003)	(0.003)		(0.002)	(0.002)		(0.004)
Summer precipitation deviation		−0.001	−0.001		−0.000	0.000		−0.005**
		(0.001)	(0.001)		(0.002)	(0.002)		(0.002)
Railway density		0.015	−0.443**		0.233	−0.224		0.111
		(0.189)	(0.177)		(0.277)	(0.277)		(0.643)
Serf share in 1858			0.001***			0.002***		
			(0.000)			(0.000)		
Fertile soil			0.029			0.033		
			(0.018)			(0.028)		
Forest share, 1881			0.047			0.013		
			(0.035)			(0.057)		
Terrain ruggedness			0.001			−0.001		
			(0.001)			(0.001)		
River density			0.000			0.001		
			(0.000)			(0.001)		
Province capital in district			−0.022*			−0.050**		
			(0.013)			(0.025)		
Distance to Moscow			0.001***			0.002***		
			(0.000)			(0.000)		
Distance to Saint Petersburg			−0.000**			−0.001***		
			(0.000)			(0.000)		
Former Poland-Lithuania territory			0.013			0.035		
			(0.014)			(0.027)		
Log district area			−0.029**			−0.022		
			(0.013)			(0.016)		
Log rural population	0.132***	0.133***	0.135***	0.178***	0.183***	0.171***	0.242***	0.241***
	(0.010)	(0.010)	(0.015)	(0.017)	(0.017)	(0.022)	(0.075)	(0.075)
District FE	N	N	N	N	N	N	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y	Y
Num. obs.	12776	12740	12558	12776	12740	12558	12776	12740
Log Likelihood	-4625.259	-4624.737	-4474.772					
Deviance	4399.760	4400.223	4435.966					
R^2				0.032	0.032	0.045	0.002	0.003
Adj. R^2				0.031	0.032	0.044	-0.040	-0.040

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Cluster-robust standard errors in parentheses. For Models (1) - (3) partial effects for the average observation are provided in order to make them roughly comparable to OLS marginal effects.

Table 4.6: Peasant Unrest, Rural and Urban Industrialization, and Land Inequality (1879–1904)

Dependent Variable:	Number of Peasant Disturbances in a District-Year					
	Negbin	OLS	OLS	Negbin	OLS	OLS
	(1)	(2)	(3)	(4)	(5)	(6)
Log urban workers per 1000 people	-0.004^{***}	-0.003	0.000			
	(0.001)	(0.002)	(0.004)			
Log rural workers per 1000 people				-0.000	0.006^{*}	-0.003
				(0.002)	(0.003)	(0.005)
Share of allotment land	-0.111^{***}	-0.150^{**}	-0.109	-0.106^{***}	-0.134^{**}	-0.098
	(0.041)	(0.064)	(0.212)	(0.041)	(0.065)	(0.212)
Share of allotment land*Log urban workers per 1000 people	0.003	-0.000	0.000			
	(0.008)	(0.009)	(0.013)			
Share of allotment land*Log rural workers per 1000 people				0.008	0.016	0.020
				(0.010)	(0.012)	(0.015)
Spring temperature deviation	0.002	-0.003	0.007	0.002	-0.004	0.007
	(0.003)	(0.002)	(0.004)	(0.003)	(0.002)	(0.004)
Summer precipitation deviation	-0.001	0.000	-0.005^{**}	-0.001	0.000	-0.005^{**}
	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)
Railway density	-0.391^{**}	-0.098	0.132	-0.467^{***}	-0.231	0.136
	(0.175)	(0.274)	(0.648)	(0.179)	(0.280)	(0.643)
Serf share in 1858	0.001^{***}	0.002^{***}		0.001^{***}	0.002^{***}	
	(0.000)	(0.000)		(0.000)	(0.000)	
Fertile soil	0.021	0.025		0.029^{*}	0.033	
	(0.018)	(0.028)		(0.018)	(0.028)	
Forest share, 1881	0.035	0.026		0.042	0.013	
	(0.034)	(0.057)		(0.035)	(0.057)	
Terrain ruggedness	0.001	-0.001		0.001	-0.001	
	(0.001)	(0.001)		(0.001)	(0.001)	
River density	0.000	0.001		0.001	0.001	
	(0.000)	(0.001)		(0.000)	(0.001)	
Province capital in district	-0.017	-0.036		-0.024^{*}	-0.046^{*}	
	(0.014)	(0.025)		(0.013)	(0.024)	
Distance to Moscow	0.001^{***}	0.002^{***}		0.001^{***}	0.002^{***}	
	(0.000)	(0.000)		(0.000)	(0.000)	
Distance to Saint Petersburg	-0.000^{**}	-0.001^{***}		-0.000^{***}	-0.001^{***}	
	(0.000)	(0.000)		(0.000)	(0.000)	
Former Poland-Lithuania territory	0.012	0.031		0.015	0.036	
	(0.013)	(0.028)		(0.014)	(0.027)	
Log district area	-0.029^{**}	-0.027^{*}		-0.027^{**}	-0.022	
	(0.012)	(0.016)		(0.013)	(0.016)	
Log rural population	0.138^{***}	0.175^{***}	0.234^{***}	0.134^{***}	0.171^{***}	0.237^{***}
	(0.015)	(0.022)	(0.074)	(0.015)	(0.022)	(0.074)
District FE	N	N	Y	N	N	Y
Year FE	Y	Y	Y	Y	Y	Y
Num. obs.	12558	12558	12740	12558	12558	12740
Log Likelihood	-4468.129			-4476.228		
Deviance	4425.176			4437.184		
R^2		0.045	0.003		0.045	0.003
Adj. R^2		0.044	-0.040		0.044	-0.040

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Cluster-robust standard errors in parentheses. For Models (1), (4) partial effects for the average observation are provided in order to make them roughly comparable to OLS marginal effects.

Table 4.7: Peasant Unrest, Land Inequality, and Various Industries (1879–1904)

Dependent Variable:	Number of Peasant Disturbances in a District-Year											
	Negbin	OLS	OLS	Negbin	OLS	OLS	Negbin	OLS	OLS	Negbin	OLS	OLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Log food workers per 1000 people	0.005**	0.006**	0.002									
	(0.002)	(0.003)	(0.003)									
Log animal workers per 1000 people				−0.003*	−0.007***	−0.005						
				(0.001)	(0.002)	(0.004)						
Log chemical workers per 1000 people							−0.000	−0.000	0.002			
							(0.001)	(0.002)	(0.004)			
Log mineral workers per 1000 people										0.001	0.002	0.004
										(0.001)	(0.002)	(0.004)
Share of allotment land	−0.091**	−0.134**	−0.108	−0.106***	−0.144**	−0.077	−0.111***	−0.150**	−0.105	−0.105***	−0.137**	−0.117
	(0.041)	(0.064)	(0.215)	(0.040)	(0.062)	(0.212)	(0.040)	(0.065)	(0.210)	(0.040)	(0.064)	(0.214)
Share of allotment land*Log food workers per 1000 people	−0.014	−0.004	−0.005									
	(0.013)	(0.012)	(0.013)									
Share of allotment land*Log animal workers per 1000 people				0.003	0.016	0.021						
				(0.008)	(0.010)	(0.017)						
Share of allotment land*Log chemical workers per 1000 people							0.014	0.022*	0.026			
							(0.009)	(0.012)	(0.022)			
Share of allotment land*Log mineral workers per 1000 people										0.002	0.010	−0.009
										(0.007)	(0.009)	(0.017)
Spring temperature deviation	0.002	−0.003	0.007	0.002	−0.003	0.006	0.002	−0.003	0.007	0.002	−0.004	0.007
	(0.002)	(0.002)	(0.004)	(0.003)	(0.002)	(0.004)	(0.003)	(0.002)	(0.004)	(0.003)	(0.002)	(0.004)
Summer precipitation deviation	−0.000	0.000	−0.005**	−0.000	0.000	−0.005**	−0.000	0.000	−0.005**	−0.001	0.000	−0.005*
	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)
Railway density	−0.500***	−0.142	0.123	−0.428**	−0.093	0.163	−0.454**	−0.112	0.145	−0.493***	−0.187	0.170
	(0.180)	(0.280)	(0.640)	(0.182)	(0.280)	(0.643)	(0.185)	(0.284)	(0.646)	(0.185)	(0.281)	(0.642)
Serf share in 1858	0.001***	0.002***		0.001***	0.002***		0.001***	0.002***		0.001***	0.002***	
	(0.000)	(0.000)		(0.000)	(0.000)		(0.000)	(0.000)		(0.000)	(0.000)	
Fertile soil	0.027	0.027		0.021	0.012		0.028	0.029		0.030*	0.032	
	(0.018)	(0.028)		(0.018)	(0.029)		(0.017)	(0.028)		(0.017)	(0.028)	
Forest share, 1881	0.037	0.028		0.036	0.019		0.042	0.031		0.037	0.026	
	(0.034)	(0.057)		(0.034)	(0.057)		(0.035)	(0.057)		(0.035)	(0.058)	
Terrain ruggedness	0.001	−0.002		0.001	−0.001		0.001	−0.001		0.001	−0.001	
	(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)	
River density	0.001	0.001		0.000	0.000		0.001	0.001		0.001	0.001	
	(0.000)	(0.001)		(0.000)	(0.001)		(0.000)	(0.001)		(0.001)	(0.001)	
Province capital in district	−0.028**	−0.050**		−0.018	−0.021		−0.024*	−0.042*		−0.026**	−0.048**	
	(0.012)	(0.025)		(0.014)	(0.025)		(0.013)	(0.024)		(0.012)	(0.024)	
Distance to Moscow	0.001***	0.002***		0.001***	0.002***		0.001***	0.002***		0.001***	0.002***	
	(0.000)	(0.000)		(0.000)	(0.000)		(0.000)	(0.000)		(0.000)	(0.000)	
Distance to Saint Petersburg	−0.000***	−0.001***		−0.000**	−0.001**		−0.000***	−0.001***		−0.000***	−0.001***	
	(0.000)	(0.000)		(0.000)	(0.000)		(0.000)	(0.000)		(0.000)	(0.000)	
Former Poland-Lithuania territory	0.016	0.033		0.013	0.030		0.017	0.035		0.015	0.032	
	(0.014)	(0.028)		(0.014)	(0.028)		(0.014)	(0.028)		(0.014)	(0.028)	
Log district area	−0.018	−0.017		−0.028**	−0.030*		−0.027**	−0.027		−0.026**	−0.026	
	(0.013)	(0.017)		(0.012)	(0.016)		(0.012)	(0.016)		(0.012)	(0.017)	
Log rural population	0.123***	0.164***	0.234***	0.135***	0.178***	0.230***	0.134***	0.175***	0.230***	0.132***	0.172***	0.238***
	(0.015)	(0.022)	(0.074)	(0.014)	(0.022)	(0.073)	(0.014)	(0.022)	(0.074)	(0.014)	(0.022)	(0.074)
District FE	N	N	Y	N	N	Y	N	N	Y	N	N	Y
Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Num. obs.	12558	12558	12740	12558	12558	12740	12558	12558	12740	12558	12558	12740
Log Likelihood	-4471.710			-4473.239			-4473.943			-4476.052		
Deviance	4441.908			4435.292			4437.212			4436.432		
R^2		0.045	0.003		0.046	0.003		0.045	0.003		0.045	0.003
Adj. R^2		0.044	-0.040		0.045	-0.040		0.044	-0.040		0.044	-0.040

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Cluster-robust standard errors in parentheses. For Models (1), (4), (7) partial effects for the average observation are provided in order to make them roughly comparable to OLS marginal effects.

Table 4.8: Peasant Unrest, Land Inequality, and Various Industries (1879–1904)

Dependent Variable:	Number of Peasant Disturbances in a District-Year								
	Negbin	OLS	OLS	Negbin	OLS	OLS	Negbin	OLS	OLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Log machinery workers per 1000 people	−0.000	0.002	0.002						
	(0.001)	(0.002)	(0.004)						
Log textile workers per 1000 people				−0.003**	−0.003**	−0.007**			
				(0.001)	(0.002)	(0.003)			
Log wood workers per 1000 people							−0.001	0.002	−0.003
							(0.001)	(0.002)	(0.003)
Share of allotment land	−0.111***	−0.140**	−0.118	−0.110***	−0.146**	−0.098	−0.112***	−0.149**	−0.111
	(0.042)	(0.065)	(0.211)	(0.041)	(0.064)	(0.208)	(0.040)	(0.064)	(0.212)
Share of allotment land*Log machinery workers per 1000 people	0.008	0.017*	0.014						
	(0.008)	(0.010)	(0.015)						
Share of allotment land*Log textile workers per 1000 people				0.003	0.011	0.039**			
				(0.008)	(0.009)	(0.018)			
Share of allotment land*Log wood workers per 1000 people							0.000	−0.004	0.008
							(0.007)	(0.008)	(0.014)
Spring temperature deviation	0.002	−0.003	0.007	0.002	−0.003	0.006	0.002	−0.003	0.007
	(0.003)	(0.002)	(0.004)	(0.003)	(0.002)	(0.004)	(0.003)	(0.002)	(0.004)
Summer precipitation deviation	−0.001	0.000	−0.005*	−0.000	0.000	−0.005**	−0.000	0.000	−0.005**
	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)
Railway density	−0.456***	−0.200	0.136	−0.427**	−0.082	0.145	−0.452**	−0.166	0.146
	(0.177)	(0.272)	(0.637)	(0.180)	(0.286)	(0.643)	(0.181)	(0.284)	(0.644)
Serf share in 1858	0.001***	0.002***		0.001***	0.002***		0.001***	0.002***	
	(0.000)	(0.000)		(0.000)	(0.000)		(0.000)	(0.000)	
Fertile soil	0.028	0.029		0.019	0.021		0.027	0.030	
	(0.018)	(0.028)		(0.019)	(0.030)		(0.018)	(0.028)	
Forest share, 1881	0.040	0.021		0.043	0.032		0.044	0.023	
	(0.035)	(0.058)		(0.034)	(0.058)		(0.035)	(0.057)	
Terrain ruggedness	0.001	−0.001		0.001	−0.001		0.001	−0.001	
	(0.001)	(0.001)		(0.001)	(0.002)		(0.001)	(0.001)	
River density	0.000	0.000		0.000	0.000		0.000	0.001	
	(0.000)	(0.001)		(0.000)	(0.001)		(0.000)	(0.001)	
Province capital in district	−0.023*	−0.050**		−0.019	−0.036		−0.021	−0.046*	
	(0.013)	(0.024)		(0.013)	(0.024)		(0.013)	(0.025)	
Distance to Moscow	0.001***	0.002***		0.001***	0.002***		0.001***	0.002***	
	(0.000)	(0.000)		(0.000)	(0.000)		(0.000)	(0.000)	
Distance to Saint Petersburg	−0.000***	−0.001***		−0.000**	−0.001**		−0.000***	−0.001**	
	(0.000)	(0.000)		(0.000)	(0.000)		(0.000)	(0.000)	
Former Poland-Lithuania territory	0.014	0.034		0.012	0.029		0.014	0.036	
	(0.014)	(0.028)		(0.013)	(0.028)		(0.014)	(0.028)	
Log district area	−0.029**	−0.028		−0.031**	−0.031*		−0.028**	−0.027*	
	(0.013)	(0.017)		(0.012)	(0.017)		(0.012)	(0.016)	
Log rural population	0.135***	0.173***	0.236***	0.135***	0.176***	0.230***	0.135***	0.171***	0.239***
	(0.015)	(0.022)	(0.075)	(0.014)	(0.023)	(0.073)	(0.014)	(0.022)	(0.075)
District FE	N	N	Y	N	N	Y	N	N	Y
Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Num. obs.	12558	12558	12740	12558	12558	12740	12558	12558	12740
Log Likelihood	-4475.620			-4470.192			-4475.675		
Deviance	4438.011			4431.015			4434.029		
R^2		0.045	0.003		0.045	0.003		0.045	0.003
Adj. R^2		0.044	-0.040		0.044	-0.039		0.043	-0.040

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Cluster-robust standard errors in parentheses. For Models (1), (4), (7) partial effects for the average observation are provided in order to make them roughly comparable to OLS marginal effects.

Table 4.9: Peasant Unrest, Industrialization, and Land Inequality (1879–1904), with Lagged Unrest

Dependent Variable:	Number of Peasant Disturbances in a District-Year							
	Negbin	Negbin	Negbin	OLS	OLS	OLS	OLS	OLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Lagged unrest	0.048***	0.049***	0.038***	0.214***	0.214***	0.205***	0.122***	0.122***
	(0.003)	(0.003)	(0.003)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)
Log workers per 1000 people	−0.003	−0.003	−0.002	0.001	0.001	0.005*	−0.000	−0.001
	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.009)	(0.009)
Share of allotment land	−0.121***	−0.122***	−0.084**	−0.197***	−0.199***	−0.103*	−0.100	−0.111
	(0.021)	(0.022)	(0.037)	(0.031)	(0.031)	(0.054)	(0.215)	(0.212)
Share of allotment land*Log workers per 1000 people	0.021*	0.021*	0.013	0.023*	0.024*	0.026*	0.058**	0.059**
	(0.011)	(0.011)	(0.011)	(0.014)	(0.014)	(0.014)	(0.023)	(0.025)
Spring temperature deviation		−0.000	0.002		−0.005*	−0.004		0.008*
		(0.003)	(0.002)		(0.002)	(0.002)		(0.004)
Summer precipitation deviation		−0.002*	−0.001		−0.001	−0.000		−0.005**
		(0.001)	(0.001)		(0.002)	(0.002)		(0.002)
Railway density		0.001	−0.408***		0.166	−0.195		0.080
		(0.161)	(0.152)		(0.227)	(0.230)		(0.599)
Serf share in 1858			0.001***			0.001***		
			(0.000)			(0.000)		
Fertile soil			0.032**			0.033		
			(0.016)			(0.024)		
Forest share, 1881			0.046			0.015		
			(0.031)			(0.047)		
Terrain ruggedness			0.001			−0.001		
			(0.001)			(0.001)		
River density			0.001			0.001		
			(0.000)			(0.001)		
Province capital in district			−0.021*			−0.043**		
			(0.011)			(0.020)		
Distance to Moscow			0.001***			0.002***		
			(0.000)			(0.000)		
Distance to Saint Petersburg			−0.000**			−0.001***		
			(0.000)			(0.000)		
Former Poland-Lithuania territory			0.016			0.027		
			(0.012)			(0.023)		
Log district area			−0.020*			−0.016		
			(0.011)			(0.013)		
Log rural population	0.112***	0.112***	0.114***	0.143***	0.148***	0.136***	0.202***	0.200***
	(0.008)	(0.008)	(0.012)	(0.013)	(0.013)	(0.017)	(0.067)	(0.067)
Num. obs.	12275	12250	12075	12275	12250	12075	12275	12250
Log Likelihood	-4408.995	-4407.508	-4284.917					
Deviance	4336.226	4335.448	4333.813					
R^2				0.074	0.074	0.083	0.016	0.017
Adj. R^2				0.073	0.074	0.082	-0.027	-0.027

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Cluster-robust standard errors in parentheses. For Models (1) - (3) partial effects for the average observation are provided in order to make them roughly comparable to OLS marginal effects.

Table 4.10: Binary Peasant Unrest, Industrialization, and Land Inequality (1879–1904), with Lagged Unrest

Dependent Variable:	Peasant Disturbance in a District-Year							
	Logit	Logit	Logit	OLS	OLS	OLS	OLS	OLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Lagged unrest	0.098***	0.099***	0.079***	0.154***	0.154***	0.145***	0.058***	0.058***
	(0.012)	(0.012)	(0.011)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
Log workers per 1000 people	−0.003	−0.002	−0.001	−0.002	−0.002	0.001	−0.002	−0.002
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.006)	(0.006)
Share of allotment land	−0.089***	−0.088***	−0.075***	−0.119***	−0.119***	−0.071**	−0.128	−0.140
	(0.018)	(0.018)	(0.029)	(0.021)	(0.021)	(0.032)	(0.124)	(0.124)
Share of allotment land*Log workers per 1000 people	0.015*	0.016*	0.010	0.012	0.013	0.013	0.036**	0.038**
	(0.009)	(0.009)	(0.010)	(0.009)	(0.009)	(0.010)	(0.017)	(0.019)
Spring temperature deviation		0.000	0.002		−0.002	−0.001		0.004
		(0.002)	(0.002)		(0.002)	(0.002)		(0.002)
Summer precipitation deviation		−0.001	−0.001		0.002	0.002		−0.002
		(0.001)	(0.001)		(0.001)	(0.001)		(0.002)
Railway density		−0.064	−0.418***		0.013	−0.234*		−0.185
		(0.114)	(0.116)		(0.122)	(0.129)		(0.351)
Serf share in 1858			0.000***			0.001***		
			(0.000)			(0.000)		
Fertile soil			0.022*			0.015		
			(0.013)			(0.014)		
Forest share, 1881			0.030			0.007		
			(0.024)			(0.027)		
Terrain ruggedness			0.001			−0.000		
			(0.001)			(0.001)		
River density			0.000			0.000		
			(0.000)			(0.000)		
Province capital in district			−0.018**			−0.027**		
			(0.009)			(0.012)		
Distance to Moscow			0.000***			0.001***		
			(0.000)			(0.000)		
Distance to Saint Petersburg			−0.000**			−0.000***		
			(0.000)			(0.000)		
Former Poland-Lithuania territory			0.015			0.027*		
			(0.011)			(0.015)		
Log district area			−0.019**			−0.009		
			(0.008)			(0.007)		
Log rural population	0.082***	0.082***	0.091***	0.091***	0.094***	0.089***	0.091**	0.088**
	(0.006)	(0.006)	(0.010)	(0.007)	(0.007)	(0.010)	(0.037)	(0.037)
Num. obs.	12275	12250	12075					
Log Likelihood	-3476.045	-3475.375	-3361.646					
Deviance	6954.089	6952.750	6725.291					
R^2				0.055	0.056	0.064	0.005	0.005
Adj. R^2				0.055	0.055	0.063	-0.039	-0.039
Num. obs.				12275	12250	12075	12275	12250

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Cluster-robust standard errors in parentheses. For Models (1) - (3) partial effects for the average observation are provided in order to make them roughly comparable to OLS marginal effects.

Table 4.11: Peasant Unrest, Industrialization, and Land Inequality (1879–1904), Spatial Lag and Autocorrelation

Independent Variable	tot industry (1)	tot industry (2)	tot industry (3)	tot industry (4)	food (5)	food (6)	food (7)	food (8)	textiles (9)	textiles (10)	textiles (11)	textiles (12)
Lag peasant unrest		0.167***		0.114***		0.167***		0.114***		0.167***		0.114***
		(0.008)		(0.009)		(0.008)		(0.009)		(0.008)		(0.009)
Log workers per 1000 people	0.005*	0.004	−0.001	−0.001								
	(0.003)	(0.003)	(0.009)	(0.009)								
Log food workers per 1000 people					0.006**	0.005**	−0.000	0.000				
					(0.002)	(0.002)	(0.004)	(0.004)				
Log textile workers per 1000 people									−0.003**	−0.002**	−0.006**	−0.005*
									(0.001)	(0.001)	(0.003)	(0.003)
Share of allotment land	−0.106***	−0.091**	−0.153	−0.132	−0.111***	−0.095**	−0.139	−0.119	−0.118***	−0.102***	−0.134	−0.115
	(0.039)	(0.039)	(0.205)	(0.203)	(0.039)	(0.039)	(0.205)	(0.203)	(0.039)	(0.039)	(0.204)	(0.202)
Share of allotment land*Log workers per 1000 people	0.036**	0.031**	0.056	0.051								
	(0.015)	(0.015)	(0.040)	(0.040)								
Share of allotment land*Log food workers per 1000 people					−0.013	−0.012	−0.006	−0.005				
					(0.011)	(0.011)	(0.022)	(0.021)				
Share of allotment land*Log textile workers per 1000 people									0.016**	0.013*	0.037*	0.032
									(0.008)	(0.008)	(0.020)	(0.020)
Spring temperature deviation	−0.001	−0.003	0.007*	0.006*	−0.001	−0.003	0.007*	0.006*	−0.001	−0.003	0.007*	0.006
	(0.002)	(0.002)	(0.004)	(0.004)	(0.002)	(0.002)	(0.004)	(0.004)	(0.002)	(0.002)	(0.004)	(0.004)
Summer precipitation deviation	0.000	−0.001	−0.004**	−0.004*	0.000	−0.001	−0.004**	−0.004*	0.000	−0.000	−0.004**	−0.004*
	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.002)	(0.002)
Railway density	−0.216	−0.190	−0.035	0.001	−0.112	−0.106	−0.012	0.024	−0.057	−0.063	−0.008	0.025
	(0.183)	(0.184)	(0.489)	(0.484)	(0.177)	(0.178)	(0.490)	(0.485)	(0.178)	(0.180)	(0.488)	(0.483)
Serf share in 1858	0.001***	0.001***			0.001***	0.001***			0.001***	0.001***		
	(0.000)	(0.000)			(0.000)	(0.000)			(0.000)	(0.000)		
Fertile soil	0.016	0.013			0.011	0.009			0.002	0.002		
	(0.018)	(0.018)			(0.018)	(0.019)			(0.019)	(0.019)		
Forest share, 1881	−0.029	−0.029			−0.012	−0.015			−0.012	−0.016		
	(0.035)	(0.035)			(0.035)	(0.035)			(0.034)	(0.035)		
Terrain ruggedness	−0.001	−0.001			−0.002*	−0.001			−0.001	−0.001		
	(0.001)	(0.001)			(0.001)	(0.001)			(0.001)	(0.001)		
River density	0.001	0.001			0.001	0.001			0.001	0.001		
	(0.001)	(0.001)			(0.001)	(0.001)			(0.001)	(0.001)		
Province capital in district	−0.054***	−0.045***			−0.057***	−0.048***			−0.042***	−0.035**		
	(0.015)	(0.015)			(0.015)	(0.015)			(0.015)	(0.015)		
Distance to Moscow	0.001***	0.001***			0.001***	0.001***			0.001***	0.001***		
	(0.000)	(0.000)			(0.000)	(0.000)			(0.000)	(0.000)		
Distance to Saint Petersburg	−0.000***	−0.000**			−0.000***	−0.000**			−0.000**	−0.000*		
	(0.000)	(0.000)			(0.000)	(0.000)			(0.000)	(0.000)		
Former Poland-Lithuania territory	0.028**	0.022			0.029**	0.023*			0.022	0.017		
	(0.013)	(0.014)			(0.013)	(0.013)			(0.013)	(0.014)		
Log district area	−0.007	−0.004			0.001	0.004			−0.017**	−0.012		
	(0.008)	(0.008)			(0.009)	(0.009)			(0.008)	(0.008)		
Log rural population	0.119***	0.095***	0.192***	0.159***	0.109***	0.086***	0.190***	0.156***	0.124***	0.099***	0.184***	0.152***
	(0.010)	(0.010)	(0.045)	(0.045)	(0.011)	(0.011)	(0.045)	(0.045)	(0.010)	(0.010)	(0.045)	(0.045)
Spatial lag	0.106***	0.096***	0.068***	0.069***	0.106***	0.097***	0.068***	0.069***	0.106***	0.096***	0.069***	0.069***
	(0.003)	(0.004)	(0.008)	(0.007)	(0.003)	(0.004)	(0.008)	(0.007)	(0.003)	(0.004)	(0.008)	(0.007)
Spatial autocorrelation	−0.096***	−0.085***	−0.038***	−0.041***	−0.096***	−0.085***	−0.038***	−0.041***	−0.096***	−0.085***	−0.039***	−0.042***
	(0.006)	(0.006)	(0.011)	(0.010)	(0.006)	(0.006)	(0.011)	(0.010)	(0.006)	(0.006)	(0.011)	(0.010)
District FE	N	N	Y	Y	N	N	Y	Y	N	N	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Num. obs.	12050	12050	12050	12050	12050	12050	12050	12050	12050	12050	12050	12050
LogLik	-8382.091	-8172.082			-8382.527	-8172.081			-8381.261	-8171.827		

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Spatially correlated standard errors (Kapoor, Kelejian and Prucha 2007) in parentheses.

Table 4.12: Peasant Unrest, Industrialization, and Land Inequality (1879–1904), Total Communal Land

	Negbin (1)	OLS (2)	OLS (3)	Negbin (4)	OLS (5)	OLS (6)	Negbin (7)	OLS (8)	OLS (9)
Log workers per capita	−0.002	0.006	−0.003						
	(0.002)	(0.004)	(0.008)						
Log food workers per capita				0.005**	0.006**	0.002			
				(0.002)	(0.003)	(0.003)			
Log textile workers per capita							−0.003**	−0.003**	−0.007**
							(0.001)	(0.002)	(0.003)
Share of communal land	−0.104**	−0.123*	−0.108	−0.087**	−0.124*	−0.094	−0.106**	−0.138**	−0.084
	(0.041)	(0.065)	(0.184)	(0.041)	(0.063)	(0.188)	(0.041)	(0.064)	(0.181)
Share of communal land*Log workers per capita	0.015	0.027*	0.045**						
	(0.011)	(0.016)	(0.021)						
Share of communal land*Log food workers per capita				−0.014	−0.003	−0.002			
				(0.012)	(0.012)	(0.013)			
Share of communal land*Log textile workers per capita							0.003	0.010	0.034*
							(0.007)	(0.009)	(0.018)
Spring temperature deviation	0.002	−0.003	0.006	0.002	−0.003	0.007	0.002	−0.003	0.006
	(0.003)	(0.002)	(0.004)	(0.003)	(0.002)	(0.004)	(0.003)	(0.002)	(0.004)
Summer precipitation deviation	−0.001	0.000	−0.005**	−0.000	0.000	−0.005**	−0.000	0.000	−0.005**
	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)
Railway density	−0.444**	−0.215	0.127	−0.502***	−0.139	0.136	−0.429**	−0.077	0.155
	(0.178)	(0.278)	(0.646)	(0.180)	(0.281)	(0.643)	(0.181)	(0.287)	(0.645)
Serf share in 1858	0.001***	0.002***		0.001***	0.002***		0.001***	0.002***	
	(0.000)	(0.000)		(0.000)	(0.000)		(0.000)	(0.000)	
Fertile soil	0.027	0.032		0.025	0.026		0.018	0.020	
	(0.018)	(0.029)		(0.018)	(0.028)		(0.019)	(0.030)	
Forest share, 1881	0.045	0.016		0.035	0.029		0.041	0.033	
	(0.035)	(0.057)		(0.035)	(0.057)		(0.035)	(0.058)	
Terrain ruggedness	0.001	−0.001		0.001	−0.002		0.001	−0.001	
	(0.001)	(0.001)		(0.001)	(0.002)		(0.001)	(0.002)	
River density	0.000	0.001		0.001	0.001		0.000	0.000	
	(0.000)	(0.001)		(0.000)	(0.001)		(0.000)	(0.001)	
Province capital in district	−0.022*	−0.049**		−0.028**	−0.049**		−0.019	−0.035	
	(0.013)	(0.025)		(0.012)	(0.025)		(0.013)	(0.024)	
Distance to Moscow	0.001***	0.002***		0.001***	0.002***		0.001***	0.002***	
	(0.000)	(0.000)		(0.000)	(0.000)		(0.000)	(0.000)	
Distance to Saint Petersburg	−0.000**	−0.001***		−0.000***	−0.001***		−0.000**	−0.001**	
	(0.000)	(0.000)		(0.000)	(0.000)		(0.000)	(0.000)	
Former Poland-Lithuania territory	0.013	0.034		0.016	0.032		0.012	0.027	
	(0.014)	(0.028)		(0.014)	(0.028)		(0.013)	(0.028)	
Log district area	−0.028**	−0.022		−0.017	−0.017		−0.030**	−0.030*	
	(0.013)	(0.016)		(0.013)	(0.018)		(0.012)	(0.017)	
Log rural population	0.134***	0.170***	0.246***	0.122***	0.163***	0.238***	0.135***	0.175***	0.236***
	(0.015)	(0.022)	(0.076)	(0.015)	(0.022)	(0.075)	(0.014)	(0.023)	(0.074)
Num. obs.	12558	12558	12740	12558	12558	12740	12558	12558	12740
Log Likelihood	-4475.543			-4472.091			-4470.640		
R^2		0.045	0.003		0.045	0.003		0.045	0.003
Adj. R^2		0.044	-0.040		0.044	-0.040		0.044	-0.039

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Cluster-robust standard errors in parentheses. For Models (1), (4), and (6) partial effects for the average observation are provided in order to make them roughly comparable to OLS marginal effects.

Table 4.13: Peasant Unrest, Industrialization, and Land Inequality (1879–1904), Total Peasant Land

	Negbin (1)	OLS (2)	OLS (3)	Negbin (4)	OLS (5)	OLS (6)	Negbin (7)	OLS (8)	OLS (9)
Log workers per capita	−0.002	0.005	−0.002						
	(0.002)	(0.004)	(0.008)						
Log food workers per capita				0.005**	0.006**	0.003			
				(0.002)	(0.003)	(0.003)			
Log textile workers per capita							−0.003**	−0.003**	−0.006**
							(0.001)	(0.002)	(0.003)
Share of peasant land	−0.079**	−0.092	−0.154	−0.062	−0.094	−0.127	−0.082**	−0.119**	−0.136
	(0.039)	(0.060)	(0.181)	(0.038)	(0.058)	(0.186)	(0.040)	(0.060)	(0.180)
Share of peasant land*Log workers per capita	0.015	0.029**	0.050**						
	(0.011)	(0.015)	(0.022)						
Share of peasant land*Log food workers per capita				−0.014	−0.001	0.007			
				(0.011)	(0.010)	(0.012)			
Share of peasant land*Log textile workers per capita							0.005	0.013	0.024
							(0.007)	(0.008)	(0.018)
Spring temperature deviation	0.002	−0.004	0.006	0.002	−0.003	0.007	0.002	−0.003	0.007
	(0.003)	(0.002)	(0.004)	(0.002)	(0.002)	(0.004)	(0.003)	(0.002)	(0.004)
Summer precipitation deviation	−0.001	0.000	−0.005**	−0.000	0.000	−0.005*	−0.000	0.000	−0.005**
	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)
Railway density	−0.432**	−0.189	0.121	−0.493***	−0.123	0.147	−0.418**	−0.058	0.157
	(0.182)	(0.278)	(0.649)	(0.184)	(0.280)	(0.645)	(0.184)	(0.286)	(0.647)
Serf share in 1858	0.001***	0.002***		0.001***	0.002***		0.001***	0.002***	
	(0.000)	(0.000)		(0.000)	(0.000)		(0.000)	(0.000)	
Fertile soil	0.028	0.035		0.026	0.027		0.019	0.019	
	(0.018)	(0.029)		(0.018)	(0.029)		(0.019)	(0.031)	
Forest share, 1881	0.046	0.024		0.036	0.034		0.041	0.033	
	(0.036)	(0.058)		(0.036)	(0.059)		(0.036)	(0.059)	
Terrain ruggedness	0.001	−0.001		0.001	−0.002		0.001	−0.001	
	(0.001)	(0.001)		(0.001)	(0.002)		(0.001)	(0.002)	
River density	0.001	0.001		0.001	0.001		0.001	0.000	
	(0.001)	(0.001)		(0.000)	(0.001)		(0.000)	(0.001)	
Province capital in district	−0.021	−0.047*		−0.027**	−0.047*		−0.017	−0.032	
	(0.013)	(0.025)		(0.012)	(0.025)		(0.014)	(0.024)	
Distance to Moscow	0.001***	0.002***		0.001***	0.002***		0.001***	0.002***	
	(0.000)	(0.000)		(0.000)	(0.000)		(0.000)	(0.000)	
Distance to Saint Petersburg	−0.000***	−0.001***		−0.001***	−0.001***		−0.000**	−0.001***	
	(0.000)	(0.000)		(0.000)	(0.000)		(0.000)	(0.000)	
Former Poland-Lithuania territory	0.010	0.029		0.014	0.029		0.008	0.022	
	(0.014)	(0.028)		(0.014)	(0.028)		(0.014)	(0.029)	
Log district area	−0.024**	−0.020		−0.012	−0.014		−0.027**	−0.029*	
	(0.012)	(0.016)		(0.012)	(0.017)		(0.012)	(0.017)	
Log rural population	0.130***	0.167***	0.252***	0.118***	0.160***	0.242***	0.131***	0.174***	0.242***
	(0.014)	(0.022)	(0.077)	(0.014)	(0.022)	(0.077)	(0.014)	(0.022)	(0.076)
Num. obs.	12558	12558	12740	12558	12558	12740	12558	12558	12740
Log Likelihood	-4477.737			-4474.116			-4472.405		
R^2		0.045	0.003		0.045	0.003		0.045	0.003
Adj. R^2		0.043	-0.040		0.043	-0.040		0.044	-0.039

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Cluster-robust standard errors in parentheses. For Models (1), (4), and (6) partial effects for the average observation are provided in order to make them roughly comparable to OLS marginal effects.

Table 4.14: Peasant Unrest, Industrialization, and Land Inequality (1879–1904), Controlling for Other Land Inequality Measures

	(1)	(2)	(3)	(4)	(5)	(6)
Log workers per capita	0.006			0.006		
	(0.004)			(0.004)		
Log food workers per capita		0.006**			0.006**	
		(0.003)			(0.003)	
Log textile workers per capita			−0.004**			−0.004**
			(0.001)			(0.001)
Share of allotment land	−0.126	−0.141*	−0.143*			
	(0.078)	(0.076)	(0.076)			
Share of communal land				−0.113	−0.123*	−0.128*
				(0.076)	(0.074)	(0.074)
Share of allotment land*Log workers per capita	0.030*					
	(0.017)					
Share of allotment land*Log food workers per capita		0.003				
		(0.014)				
Share of allotment land*Log textile workers per capita			0.008			
			(0.009)			
Share of communal land*Log workers per capita				0.027*		
				(0.016)		
Share of communal land*Log food workers per capita					0.004	
					(0.013)	
Share of communal land*Log textile workers per capita						0.007
						(0.009)
Spring temperature deviation	−0.004	−0.003	−0.003	−0.004	−0.003	−0.003
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Summer precipitation deviation	−0.000	−0.000	−0.000	−0.000	−0.000	−0.000
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Railway density	−0.214	−0.140	−0.052	−0.211	−0.141	−0.051
	(0.282)	(0.285)	(0.290)	(0.283)	(0.286)	(0.291)
Serf share in 1858	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Allotment land Gini, 1905	0.036	0.022	0.036	0.044	0.033	0.045
	(0.054)	(0.055)	(0.055)	(0.054)	(0.055)	(0.055)
Private land Gini, 1905	−0.015	−0.016	−0.003	−0.019	−0.020	−0.007
	(0.049)	(0.049)	(0.051)	(0.049)	(0.050)	(0.051)
Fertile soil	0.032	0.021	0.017	0.033	0.021	0.017
	(0.028)	(0.028)	(0.029)	(0.029)	(0.029)	(0.029)
Forest share, 1881	0.015	0.022	0.032	0.020	0.027	0.037
	(0.058)	(0.060)	(0.061)	(0.059)	(0.061)	(0.062)
Terrain ruggedness	−0.001	−0.002	−0.001	−0.001	−0.002	−0.001
	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)
River density	0.001	0.001	0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Province capital in district	−0.049*	−0.048*	−0.033	−0.048*	−0.048*	−0.033
	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)
Distance to Moscow	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
Distance to Saint Petersburg	−0.001***	−0.001***	−0.001**	−0.001***	−0.001***	−0.001**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Former Poland-Lithuania territory	0.034	0.033	0.027	0.034	0.032	0.026
	(0.028)	(0.028)	(0.029)	(0.028)	(0.028)	(0.029)
Log district area	−0.026	−0.023	−0.034*	−0.025	−0.023	−0.033*
	(0.017)	(0.018)	(0.018)	(0.017)	(0.018)	(0.018)
Log rural population	0.170***	0.165***	0.173***	0.169***	0.164***	0.172***
	(0.023)	(0.024)	(0.024)	(0.023)	(0.024)	(0.024)
R^2	0.047	0.047	0.047	0.047	0.047	0.047
Adj. R^2	0.046	0.045	0.046	0.045	0.045	0.046
Num. obs.	11986	11986	11986	11986	11986	11986

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. OLS models, cluster-robust standard errors in parentheses.

Figure 4.7: Regions of the European Russian Empire. In Table 4.15 and 4.16 the following groupings are used: Ukraine/Don includes Novorossiya, Malorossiya and South-West; Belarus/Lithuania corresponds to North-West; Central Black Soil corresponds to the Central Agrarian region. Province borders are shown.

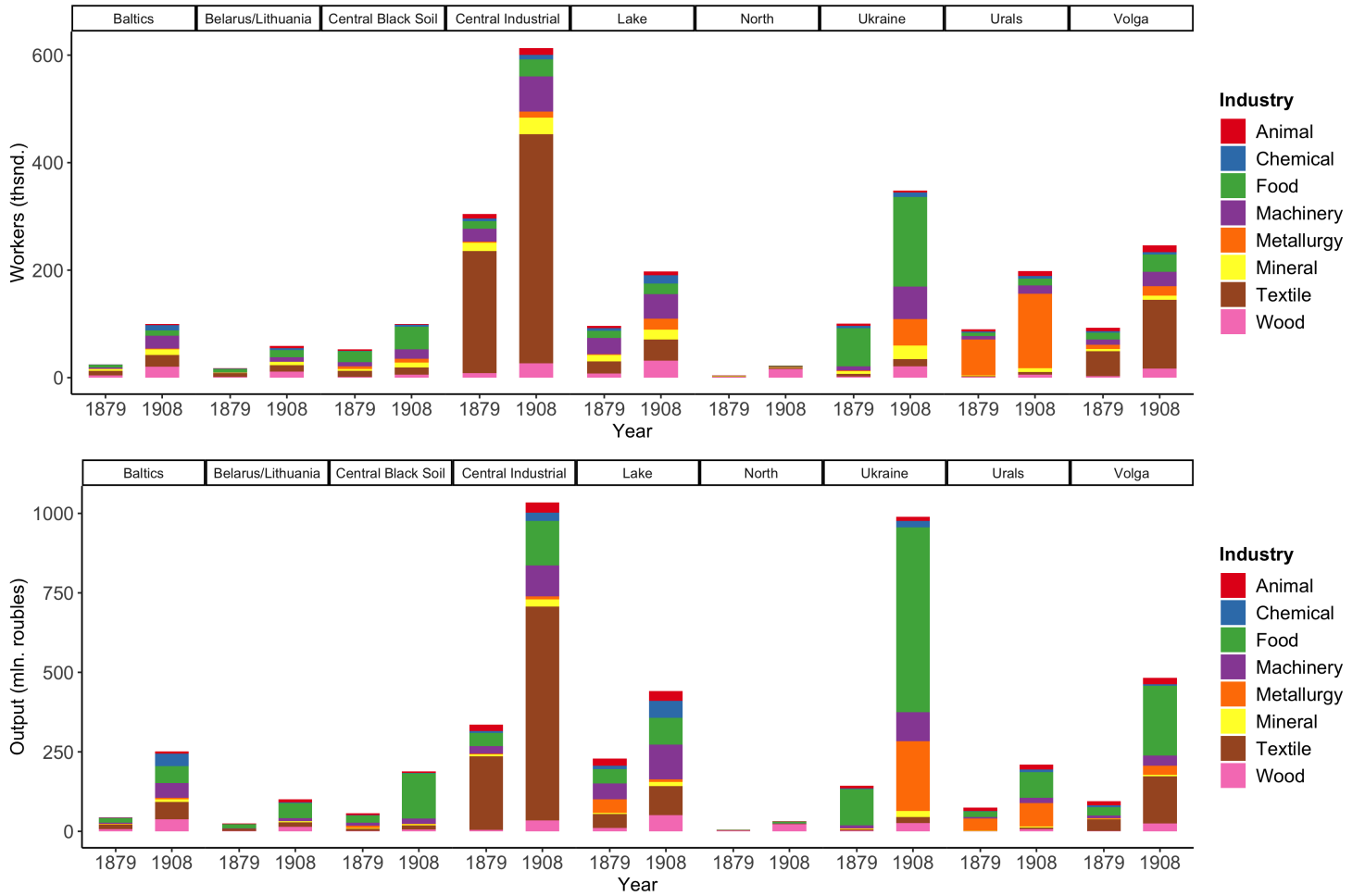

Figure 4.8: Composition of industrial workers (top panel) and output (bottom panel) in 1879 and 1908 in the regions of the European Russian Empire. The following groupings are used: Ukraine/Don includes Novorossiya, Malorossiya and South-West; Belarus/Lithuania corresponds to North-West; Central Black Soil corresponds to the Central Agrarian region.

Table 4.15: Peasant Unrest, Inequality, and Industrialization by Region

	North	North	Ukraine/ Don	Ukraine/ Don	Central Black Soil	Central Black Soil	Central Industrial	Central Industrial	Volga	Volga
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Log workers per 1000 people	0.012	0.028	0.013	−0.066**	0.004	0.013	0.003	−0.018	0.003	0.033
	(0.019)	(0.044)	(0.012)	(0.032)	(0.017)	(0.032)	(0.005)	(0.014)	(0.009)	(0.022)
Share of allotment land	0.445**	−0.293	−0.551***	−1.941*	−0.094	0.860	−0.223*	−0.827	−0.286*	−0.215
	(0.216)	(0.783)	(0.161)	(1.079)	(0.246)	(1.022)	(0.123)	(0.829)	(0.169)	(0.623)
Share of allotment land*Log workers per 1000 people	0.037	0.062	0.087	0.055	−0.022	−0.131	0.015	0.154	−0.095**	−0.037
	(0.046)	(0.104)	(0.083)	(0.096)	(0.103)	(0.139)	(0.045)	(0.144)	(0.046)	(0.088)
District FE	N	Y	N	Y	N	Y	N	Y	N	Y
Num. obs.	442	468	2704	2756	1586	1586	2210	2210	1950	1950
R^2	0.059	0.007	0.080	0.012	0.026	0.006	0.033	0.004	0.041	0.013
Adj. R^2	0.024	-0.109	0.074	-0.040	0.017	-0.055	0.026	-0.051	0.033	-0.044

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. All models contain controls and year fixed effects. Cluster-robust standard errors in parentheses.

Table 4.16: Peasant Unrest, Inequality, and Industrialization by Region

	Belarus/ Lithuania	Belarus/ Lithuania	Baltics	Baltics	Urals	Urals	Lake	Lake
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log workers per 1000 people	−0.002	−0.042	0.036**	0.036**	0.021	0.020	0.001	0.056
	(0.019)	(0.030)	(0.014)	(0.018)	(0.019)	(0.031)	(0.024)	(0.051)
Share of allotment land	−0.941**	4.058	0.120	−0.059	0.335	0.950	0.153	0.095
	(0.462)	(3.143)	(0.197)	(0.199)	(0.258)	(1.061)	(0.106)	(0.194)
Share of allotment land*Log workers per 1000 people	0.561***	−0.549*	0.140	0.215	0.036	0.186	−0.017	0.210
	(0.214)	(0.294)	(0.092)	(0.155)	(0.042)	(0.126)	(0.088)	(0.158)
District FE	N	Y	N	Y	N	Y	N	Y
Num. obs.	1378	1404	598	598	832	884	858	884
R^2	0.055	0.015	0.051	0.029	0.034	0.009	0.051	0.004
Adj. R^2	0.043	-0.048	0.025	-0.067	0.015	-0.070	0.033	-0.075

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. All models contain controls and year fixed effects. Cluster-robust standard errors in parentheses.

Table 4.17: Peasant Unrest, Inequality, and Industrialization, Scale of Unrest

Dependent Variable:	Negbin No. Villages (1)	OLS No. Villages (2)	OLS No. Villages (3)	Negbin Large (4)	OLS Large (5)	OLS Large (6)
Log workers per 1000 people	-0.011^{**}	-0.004	0.008	-0.001	-0.000	0.002
	(0.004)	(0.006)	(0.013)	(0.001)	(0.001)	(0.003)
Share of allotment land	-0.178^{***}	-0.278^{***}	-0.400	-0.027^{**}	-0.039^{**}	0.031
	(0.062)	(0.098)	(0.448)	(0.011)	(0.017)	(0.068)
Share of allotment land*Log workers per 1000 people	0.004	0.023	0.093^{**}	0.002	0.002	0.009
	(0.023)	(0.026)	(0.038)	(0.004)	(0.006)	(0.009)
Spring temperature deviation	0.002	-0.012^{***}	0.017^{**}	0.001	-0.002^{*}	0.002
	(0.004)	(0.004)	(0.008)	(0.001)	(0.001)	(0.002)
Railway density	-0.758^{***}	-0.411	-0.636	-0.106^{**}	-0.085	0.156
	(0.291)	(0.488)	(1.055)	(0.051)	(0.075)	(0.213)
Serf share in 1858	0.001^{***}	0.002^{***}		0.000	0.000^{*}	
	(0.000)	(0.001)		(0.000)	(0.000)	
Fertile soil	0.020	0.026		0.006	0.003	
	(0.027)	(0.041)		(0.005)	(0.007)	
Forest share, 1881	0.094^{*}	0.087		0.014	0.014	
	(0.056)	(0.094)		(0.010)	(0.015)	
Terrain ruggedness	0.003	0.001		-0.000	-0.000	
	(0.002)	(0.002)		(0.000)	(0.000)	
River density	0.000	0.001		0.000	0.000	
	(0.001)	(0.001)		(0.000)	(0.000)	
Province capital in district	0.001	-0.014		0.001	-0.002	
	(0.022)	(0.040)		(0.004)	(0.007)	
Distance to Moscow	0.001^{***}	0.002^{***}		0.000	0.000	
	(0.000)	(0.001)		(0.000)	(0.000)	
Distance to Saint Petersburg	-0.000	-0.001		-0.000	-0.000	
	(0.000)	(0.000)		(0.000)	(0.000)	
Former Poland-Lithuania territory	0.016	0.027		0.007	0.014^{*}	
	(0.021)	(0.042)		(0.005)	(0.008)	
Log district area	-0.047^{***}	-0.043^{*}		-0.003	0.001	
	(0.017)	(0.022)		(0.003)	(0.003)	
Log rural population	0.182^{***}	0.232^{***}	0.327^{***}	0.024^{***}	0.033^{***}	0.039^{*}
	(0.020)	(0.028)	(0.117)	(0.003)	(0.004)	(0.020)
District FE	N	N	Y	N	N	Y
Year FE	Y	Y	Y	Y	Y	Y
Num. obs.	12558	12558	12740	12558	12558	12740
Log Likelihood	-5099.271			-1415.385		
Deviance	3773.881			1605.056		
R^2		0.022	0.002		0.014	0.001
Adj. R^2		0.021	-0.041		0.013	-0.042

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. In Models (1) - (3) the dependent variable is the number of villages affected by unrest; in Models (4) - (6) the dependent variable is a the number of "large" (affecting more than one village and/or district) unrest events in a district-year. Cluster-robust standard errors in parentheses.

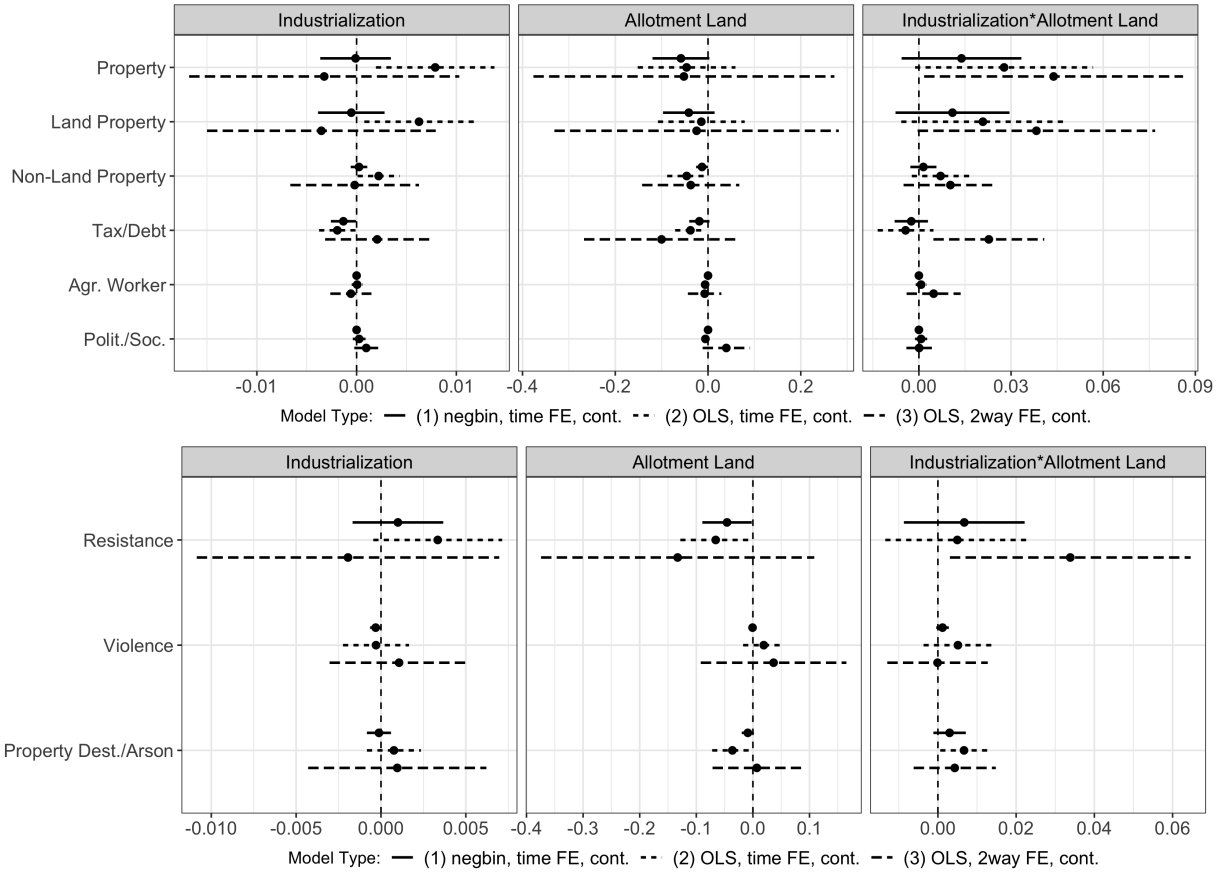

Figure 4.9: 1879–1904 peasant unrest in the European part of the Russian Empire, district-level yearly panel regression results by types of unrest and coefficients. Top panels: unrest by target and character; bottom panels: unrest by action. The dependent variable is number of conflict events in the district-year. 95% confidence intervals. "Industrialization": logarithm of industrial workers per 1000 people in the district; "Allotment land": share of allotment land in the district. "Industrialization*Allotment Land": their interaction. Cluster-robust standard errors.

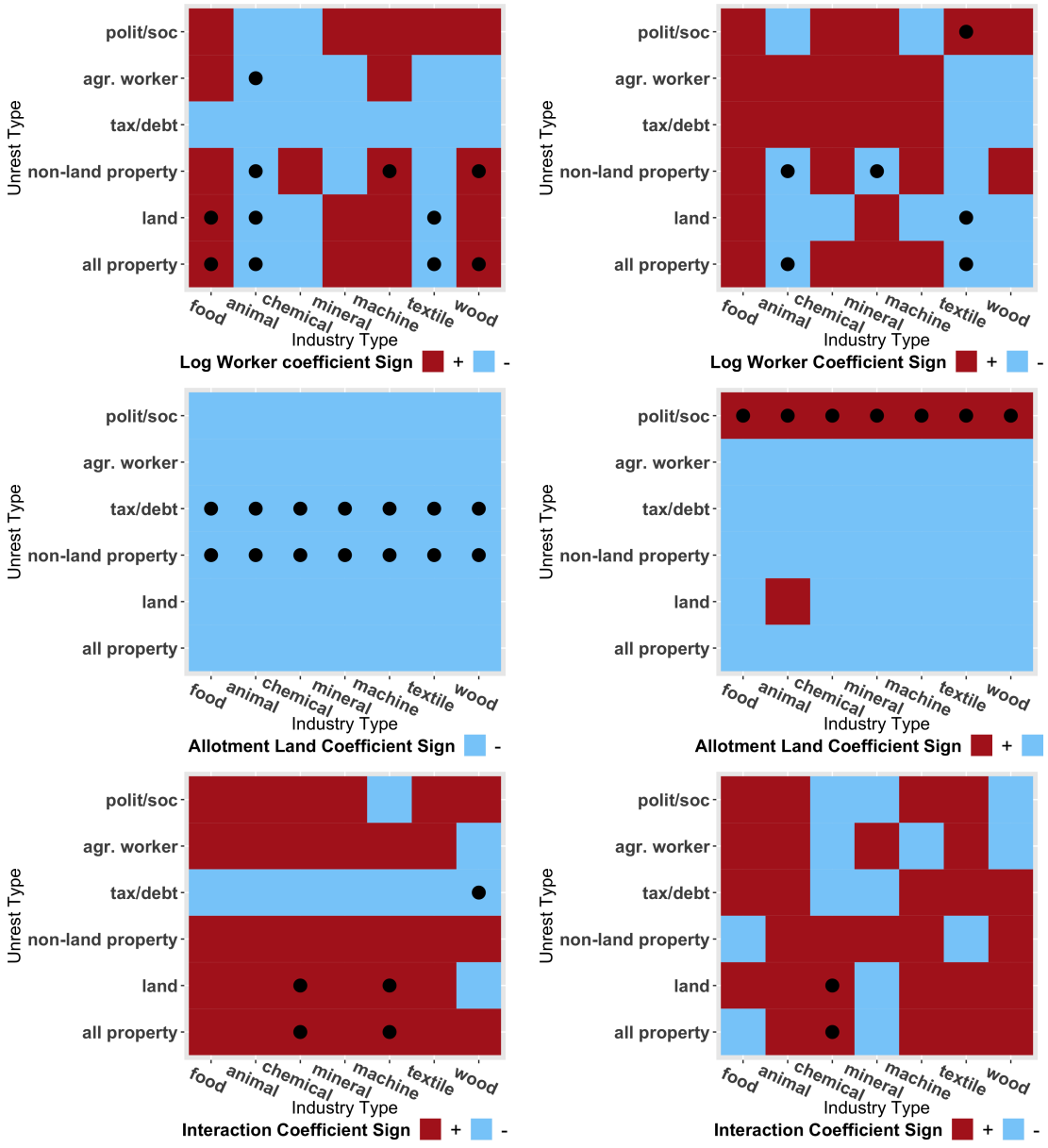

Figure 4.10: 1879–1904 peasant unrest in the European part of the Russian Empire, properties of district-level yearly panel regression coefficients by the type of unrest and industry. Each tile of a heatmap figure stands for a regression coefficient with the given type of unrest as the dependent variable, and the industry type as an independent variable. Red color denotes a positive coefficient sign; blue color – a negative coefficient sign. Black dots denote coefficients significant at 5% level. *Top row:* coefficients at the log number of workers per 1000 people; *middle row:* allotment land share coefficients; *bottom row:* interaction between log workers per 1000 people and allotment land share. *Left column:* OLS panel models with the full set of controls and time effects; *right column:* two-way fixed effects models with time-variant controls; all with cluster-robust standard errors.

Appendix 2: Description and Classification of Industries by Input Type

This appendix section describes different industrial branches in accordance with the classification I use, in particular, the sources of their raw materials, which could have an impact on their interaction with local peasant farming. The original classification of manufacturing, applied by the compilers of industrial statistics with a certain amount of variation from year to year, used twelve main groups. I use the 1908 version as the basis. Groups 1–5 included processing of cotton, wool, silk, hemp and other fiber materials, Group 6 – paper and related products, Group 7 – wood, Group 8 – metal products and machinery, Group 9 – "mineral substances", Group 10 – "animal products", Group 11 – food (distinguishing between those to which excise taxes were applied and not), Group 12 – chemicals, and Group 13 – metallurgy. I have combined them into eight groups described below. In the publications for 1879, 1884, 1890, and 1894 there was a more detailed classification, unfortunately unavailable for later years.

I do not have enough information to construct a quantitative metric of the level of the industry's dependence on local sources, but using fragmentary statistical evidence and qualitative observations published in Ministerstvo Finansov 1896 and Dmitriev 1918, it is possible to infer this property of interest in an informal way.

Animal products. This branch includes manufacturing and processing of leather and fur, soap, candles, bone products, and others. The most important of them was the leather industry. Although it is hard to cite exact figures, it seems that much of the raw and manufactured skins were either imported from the United States or delivered from Southern or South-Western Ukrainian regions, specialized in cattle breeding (a particularly prominent breed was the *cherkasskii skot*; see Ministerstvo Finansov 1896,

pp. 504, 507). In the 1880s the total imports of leather and fur constituted about one fourth of the nominal domestic output (but was comparable to exports; see Ministerstvo Finansov 1896, pp. 503, 504). The leather industry also heavily depended on the imported tannings (Dmitriev 1918, pp. 358–359, ft.). The geography of manufacturing was quite diverse, and the largest centers were the Saint-Petersburg, Moscow, Tver, Polish provinces, to a lesser extent Ukraine, and then the Urals and Volga provinces.

Chemicals. This refers to the production of acids, alkali, salts, medicines, cosmetics, paints, rubber, matches, synthetic fuel and fertilizers, etc. Most of the domestic demand was covered by imported chemicals, and the domestic manufacturing to a large extent relied on the imported components, such as sodium bicarbonate or sulfur. In the 1890s the exploitation of local mineral sources, geographically concentrated, was at its early stages (Ministerstvo Finansov 1896, pp. 190–193). Manufacturing of matches seemed to be highly decentralized, with match factories existing in most provinces (Ministerstvo Finansov 1896, p. 271); at the same time, the bulk of phosphorus, their main component, was produced in the Perm' province (Ministerstvo Finansov 1896, p. 272), whereas wooden straws were made by local artisans.

Food. The food industry is represented by the three main activities: grain milling, alcohol and sugar distilling and refining. Sugar factories were located in the three main districts: South West (Left-bank Ukraine and Bessarabia), Central Agrarian (Blacksoil and East Ukraine), and Poland (this region is beyond the scope of my study). The location of sugar factories was tightly bound to the sources of raw materials: nearby plantations of sugar beets, owned either by the factories themselves or by local landowners, including peasants (Ministerstvo Finansov 1896, pp. 175–177). Each factory was served by several hundreds or thousands of hectares (Komitet Obshchestva vspomoshchestvovaniia nuzhdayushchimsya studentam Kievskago Politekhnicheskago Instituta Imperatora Aleksandra II 1913). The overall area under sugar beets could be substantial: Ta-

ble 4.19 demonstrates that in the 1890s its share was already equal to about 1–2% of the total amount of land and 2–4% of private land in the Kiev, Podoliia, Kursk an Kharkov provinces, and reached up to 4% of the total land and 10% of the private land by the second decade of the 20th century. These shares would be even larger if we take into account only arable land. Moreover, the land under sugar beets was not evenly spread across the provinces, but coalesced around sugar distilleries and refineries. Thus, growing sugar production could considerably increase demand for land at the local level.

Alcohol distilling was quite widespread, but it was most developed in Baltics, Ukraine and Russian Central Blacksoil regions (Ministerstvo Finansov 1896, p. 242). Alcohol distilleries mostly used apparently locally sourced rye, malt (made out of grain), corn, potatoes or molasses in the areas with developed sugar refining (Ministerstvo Finansov 1896, pp. 234, 244).[16]

Grain mills were located in all provinces, especially grain-growing, and followed demand, gravitating towards urban centers and major transportation routes, first waterways, and then railroads. In terms of energy use, since the mid 19th century big mills were upgraded from water to steam power, and the production of flour was growing increasingly industrialized, far surpassing local demand (Ministerstvo Finansov 1896, p. 156).

Machinery. The location of machine building and maintenance to a large extent seemed to be driven by local demand (railway or agricultural machinery workshops) or followed certain historical patterns (such as the largest factories being in Saint Petersburg and Moscow (Ministerstvo Finansov 1896, pp. 144–154)). In either case, the supply of its raw materials was disconnected from local agriculture.

[16] As the author of the review notes, the development of alcohol distilling could have a positive effect on farming, because its waste products could be used for cattle feed (Ministerstvo Finansov 1896, p. 226), however its increasing commercialization led to its detachment from peasant agriculture (Ministerstvo Finansov 1896, p. 232).

Metallurgy. Metallurgy was heavily concentrated in a limited number of districts, mostly in the Urals and Donbass, which were also the centers of iron or coal mining, that is, proximity to the sources of fuel and raw materials was crucial.

Minerals. This group includes industrial establishments producing bricks, tiles, cement, glass, ceramic tableware and related stuff. Glass factories were situated in the Orel, Kaluga, Smolensk, Vladimir, Ryazan' (Mal'tsov's factories) province, along the railroad connecting Moscow and Saint Petersburg, Nizhnii Novgorod, also in the Urals (Vyatka and Perm'), Ukraine (Volyn') and Lifland (Ministerstvo Finansov 1896, p. 280). To a considerable extent their location followed demand. Raw materials were partly imported; the fuel was local wood, but was gradually being replaced with coal (Ministerstvo Finansov 1896, pp. 284–285). Ceramic factories were often built in the old centers of artisan production, which, like the Gzhel region in the Moscow and Vladimir provinces, could be located in the areas rich with clay (Ministerstvo Finansov 1896, p. 293).[17] Notable centers emerged in Yaroslavl' and Tver'. Sand, most of the clay supply, and other materials were locally sourced (e.g. Ministerstvo Finansov 1896, p. 296), but considerable amounts of porcelain clay were imported from England (Ministerstvo Finansov 1896, p. 312). The centers of fire-proof brick production were in Moscow, Saint-Petersburg, Ukraine, and Poland (Ministerstvo Finansov 1896, p. 302). Cement factories in Saint Petersburg, the Baltics, Poland, the Moscow province, and Novorossiisk (Ministerstvo Finansov 1896, p. 326) seemed to be locally sourced (Ministerstvo Finansov 1896, pp. 322 - 323).

Textiles. In my classification textiles include such industries as cotton, wool, silk, and linen processing (in particular, spinning, weaving, and dyeing), and manufacturing of various apparel and decorations. By the early 1890s the cotton processing industry,

[17]Since the 1860s the famous Gzhel porcelain manufacturing had been in decline due to the depletion of local clay supplies, and its workers helped establish ceramic production in other places (Ministerstvo Finansov 1896, pp. 295).

to a large extent concentrated in the Moscow and Vladimir provinces, used raw cotton fiber (and insignificant amounts of yarn), which were either imported from abroad (the United States, Egypt, India, and Iran) or delivered from peripheral regions of the Russian Empire, namely Central Asia and the Caucasus (Ministerstvo Finansov 1896, p. 60). Silk spinning and weaving was organized in a similar way: whereas the manufacturing centers were located in the Moscow, Vladimir and several Polish provinces, raw materials came from Italy, France, China, and Central Asian provinces (Dmitriev 1918, pp. 60, 64).

The production and further processing of linen and hemp fiber seemed to be to a larger extent locally based, however, there existed a certain regional specialization: for example, Pskov and Vologda linen and Smolensk and Oryol hemp were widely known beyond their respective provinces. At the same time, the traditional producers of linen (and major consumers for the purposes of artisan production) were the peasants themselves, rather than the landlords (Ministerstvo Finansov 1896, p. 27). Thus, the development of the linen and hemp industry could be in relatively organic relationships with the local peasant economy.

According to rough estimates, in the early 1890s imported raw wool covered about 40% of domestic consumption (Ministerstvo Finansov 1896, p. 43); the remainder was produced within the Russian Empire, but the primary areas of commercial sheep husbandry in Southern Ukraine, parts of the Volga region, the Caucasus, and Central Asia were quite distant from centers of wool processing, such as Poland, West Belarus and the Central Industrial region (Dmitriev 1918, pp. 252–256).

Wood. Wood processing was relatively widespread, and its location was to a large extent determined by the availability of raw materials (the sparsely populated Russian North was especially rich in forest), which were largely domestic (Russia was a major wood exporter) and locally sourced (Ministerstvo Finansov 1896, pp. 125–128).

The contribution of each of these sectors in the total industrial employment and output for various years is shown in Figure 4.11. It can be seen that food and textiles are the largest industries, which together account for the majority of workers and the bulk of output. The animal and chemical industries are the smallest ones. All the sectors noticeably expanded over time.

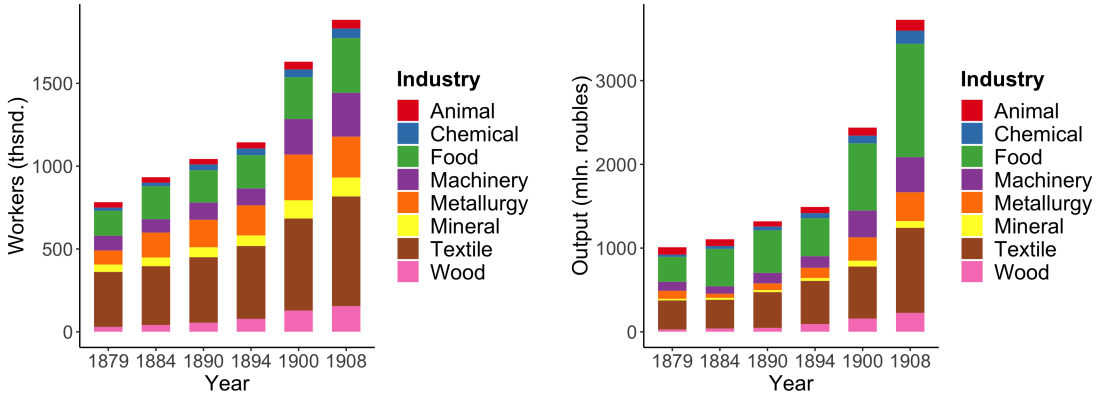

Figure 4.11: Composition of industrial workers and output (1879–1908).

Summarizing the discussion in this section, we can approximately divide the industries into four groups, depending on whether they are predominantly locally or externally sourced and whether the raw materials needed are the products of agriculture or not (Table 4.18):

Table 4.18: Classification of Industries by Input Type

	Agricultural Inputs	Non-Agricultural Inputs
Mostly locally sourced	Food, Wood	Metallurgy, Mineral
Mostly externally sourced	Animal, Textile	Chemical, Machinery

We can expect that for the industries located in the top left quadrant (food and wood processing), that is, those locally sourced and potentially competing for inputs with the peasant agriculture, the resource competition channel may prevail over the labor ab-

sorption channel. For the bottom row industries, which are sourced externally (animal, textiles, chemicals, and machinery), the labor absorption channel may be more important. This is also true for the industries in the top right quadrant (metallurgy and minerals), but given that they are sourced locally, some competition could take place, and the net effect could be weaker.

We should also keep in mind that the main type of fuel for most industries was wood, usually locally sourced, that is, the presence of any industry could lend some strength to resource competition. However, coal consumption grew, especially after the exploration of Donbass coal deposits in the 1880s, and the development of the railroad network made it possible to gradually replace imported coal and domestic wood.

Table 4.19: Land Area under Sugar Beet Cultivation in the European Part of the Russian Empire: the Late 19th–Early 20th Century

	Land under sugar beets, desyatin			Land in 1905, desyatin		% Land under sugar beets					
						% Private land			% Total land		
Province	1896/97	1904/05	1911	Private	Total	1896/97	1904/05	1911	1896/97	1904/05	1911
Bessarabia	970	885	1,700	1,656,109	3,834,824	0.06	0.05	0.10	0.03	0.02	0.04
Volhynia	18,684	23,615	36,948	2,819,930	5,772,129	0.66	0.84	1.31	0.32	0.41	0.64
Kiev	88,069	118,475	189,797	2,092,476	4,623,641	4.21	5.66	9.07	1.90	2.56	4.10
Podoliia	74,823	89,946	159,257	1,625,778	3,657,138	4.60	5.53	9.80	2.05	2.46	4.35
Kherson	3,317	6,141	10,094	3,165,707	6,145,103	0.10	0.19	0.32	0.05	0.10	0.16
Voronezh	6,731	8,448	12,952	1,588,176	5,617,916	0.42	0.53	0.82	0.12	0.15	0.23
Kursk	31,035	45,982	79,169	1,391,812	3,964,632	2.23	3.30	5.69	0.78	1.16	2.00
Oryol	1,912	3,220	3,696	1,584,486	4,010,900	0.12	0.20	0.23	0.05	0.08	0.09
Poltava	2,618	7,115	25,195	1,891,756	4,197,460	0.14	0.38	1.33	0.06	0.17	0.60
Samara	2,558	1,302	0	3,544,479	13,017,428	0.07	0.04	0.00	0.02	0.01	0.00
Tambov	5,911	5,544	11,337	2,151,907	5,723,256	0.27	0.26	0.53	0.10	0.10	0.20
Tula	1,201	2,033	3,035	1,243,980	2,706,125	0.10	0.16	0.24	0.04	0.08	0.11
Kharkov	30,330	46,962	74,542	1,608,349	4,497,271	1.89	2.92	4.63	0.67	1.04	1.66
Chernigov	11,011	18,554	31,378	1,825,624	4,384,257	0.60	1.02	1.72	0.25	0.42	0.72

Sources: Ministerstvo Finansov 1900, pp. 898–899; Ministerstvo Finansov 1907, p. 396; Komitet Obshchestva vspomoshchestvovaniia nuzhdayushchimsya studentam Kievskago Politekhnicheskago Instituta Imperatora Aleksandra II 1913, p. 248; TsSK MVD 1907, p. 10, author's calculations.

Chapter 5.
Parish-Level Study: Kursk Province in 1905–1906

5.1 Introduction

This chapter presents the results of a cross-sectional parish-level study of the determinants of peasant unrest in the Kursk province in 1905–1906 (based on Miller 2013). This analysis complements the panel study in the previous chapter looking at a lower administrative level (although with a narrower geographical scope) and addressing a broader range of possible identification threats. It also makes it possible to see whether my previous conclusions are valid for the revolutionary years, marked by a widespread and heavily embittered confrontation between peasants and landlords.

It turns out that the findings in the previous chapters are generally confirmed: we see a strong positive association of unrest with industrialization, in particular, with the food industry, which constituted the bulk of manufacturing in the province. Similarly, proximity to the nearest sugar refinery (the backbone of the food industry in the province), is also positively related to unrest. At the same time, although the coefficients on allotment land share and their interaction with industrialization have predicted signs (except for the models with the distance to sugar factories), most are not significant.

5.2 Data and Empirical Design

In order to further substantiate my theoretical propositions and reinforce the evidence provided by the district-level study I turn to a lower level of observation—namely, the parish (*volost'*), and focus on one province: the Kursk *gubernia*, which was situated in the Central Black Soil region (*Tsentral'no-chernozemnyi raion*)[1] of the Russian Empire, occupying the territory currently divided between the Kursk and Belgorod *oblasts* in present-day Russia and the Ukrainian Sumy *oblast'*. The incidence and factors of peasant unrest in this province in 1905–1906 were meticulously studied in Miller 2013, who compiled a list of settlements and parishes affected by peasant disturbances in 1905–1906, which makes feasible a rigorous quantitative analysis of their causes.

Although the Kursk province cannot be considered representative of the European part of the Empire (and none of the provinces can), it constitutes one of the most systematically studied cases of peasant unrest during the 1905–1906 revolutionary events, and is sufficiently intensive and well-documented to minimize the problem of noisiness in the data. The consideration of this time period is particularly advantageous, because it puts to the test the external validity of the findings of the district-level analysis, and it uses years when peasant unrest was particularly wide-spread and consequential. The intensity of conflict during this period surpassed even the emancipation-era disturbances, and stands in particularly stark contrast to the preceding several decades, which warrants its separate consideration.

There are several reasons why it is more useful to perform the quantitative study of this case, rather than of the 1902 Poltava-Kharkov uprising discussed in Chapter 3. First, it must be stressed that unlike the earlier Poltava-Kharkov conflict, the 1905–

[1] Constituting part of the "Central agricultural area" (*Tsentral'nyi zemledel'cheskii rayon*) according to one of classifications adopted at the time.

1906 wave of disturbances was triggered by exogenous revolutionary events, including Bloody Sunday[2] in Saint Petersburg in January 1905 and later the issuance by Nicolas II of the 1905 October Manifesto[3], which served as focal points for unrest participants all over the Empire. Thus, whereas the Poltava-Kharkov case was most helpful in exploring the possible determinants of an endogenously arising conflict, the Kursk case is good at testing which factors turned out to be the most prominent when the revolutionary wave indiscriminately swept across all the parts of the Empire.

Given that in the Kursk and most of the other provinces the intensity of unrest in that period overshadowed all the events of the previous decades, the cross-sectional design applied here is substantively similar to a difference-in-differences setup, because in the absence of a revolutionary outbreak to which all the parishes were more or less evenly exposed, it could have been possible to expect only some low-key conflict episodes in a handful of parishes. In contrast to the Poltava-Kharkov uprising, which spread along the main transportation routes connecting the two provincial capitals, many of these unrest episodes were relatively disconnected across time and space, clustering into several centers.

The quantitative analysis presented here omits the temporal aspect of the spread of disturbances, which is harder to reconstruct from the available information. The cross-sectional linear statistical model is:

$$Y_i = \beta_0 + \beta_1 I_i + \beta_2 AL_i + \beta_3 I_i * AL_i + \gamma X_i + \varepsilon_i, \tag{5.1}$$

where Y_i is a binary or count unrest value in parish i, and, as previously, I_i stands for the industrialization level, and AL_i is the allotment land share. X_i is the vector of controls

[2]The shooting of a worker demonstration which marched on the Tsar's residence to present a petition asking for the improvement of worker conditions and broad political and social reforms.

[3]That promised elections to the newly created parliament and various political and civil liberties.

for parish i, and γ is the vector of corresponding coefficients. This model is estimated with plain OLS and, with proper transformation, in two alternative versions: logit for the binary dependent variable, and negative binomial for the count one.

Industrialization in the Kursk province in the early 20th century was mostly associated with food processing and its service and maintenance. As of 1900 almost 76% of workers were employed and 90% of nominal manufacturing output was produced in the food sector. Therefore, given the results of the district-level analysis, we might expect to see a positive relationship between industrialization and unrest, which is consistent with the idea that in the case of food processing development, due to its more direct links with peasant agriculture and competition over land resources, intensification of conflict is more likely.

Drawing on Miller's account and other parish-level data available from various statistical sources, I have compiled a dataset, which contains rich cross-sectional information on 216 parishes in the 15 districts of the Kursk province. The summary of the variables is in Table 5.1, and their description is in Table 5.2.

My main dependent variables are the binary indicators of the occurrence of unrest events in a given parish, and the number of settlements which experienced disturbances in a parish in 1905–1906, which were calculated using Miller's data (Miller 2013, pp. 365–383). As in the preceding analysis, industrialization is operationalized by the logarithm of the number of workers in 1900 normalized by the total population. In order to calculate the parish-level allotment land share, I used information on the total amount of allotment land from the parish-level summary of the results of the household census conducted in 1882–1884 in the districts of the Kursk province,[4] and on the total amount of land from the description of parishes and their main settlements in 1878.[5]

[4]Kursk Gub. Statistical Bureau 1887, pp. 2–119.

[5]TsSK MVD 1880, Vyp. I. Gubernii Tsentral'noi zemledel'cheskoi oblasti. Sankt-Peterburg, pp. 246–290

In order to account for possible confounders I include several control variables, such as weather shocks, soil quality, terrain ruggedness and river density, the percentage of the area covered with forests (only at the district level), the logarithm of the parish area, and the parish population (in the 1880s, which is the latest period for which the data are available). Given that transportation routes could facilitate both propagation of unrest and its suppression, as well as affect economic development, the dummies for having a railroad or a post road segment within the parish territory are added. The dummies for the location of police offices (headed by an *uryadnik* or a *stanovoy pristav*) and minimal distance from the parish centroid to troops located in the Kursk and nearby provinces account for police capacity, in particular, the ability to quell and prevent disturbances. The dummy corresponding to the location of a town within the parish enables me to control for urbanization; I also include a dummy for the Kursk district, in which the city of Kursk, which was the provincial administrative center and the largest city in the province, was located.

As in the district-level analysis, I add an estimate of the past serfdom incidence, which could be correlated both with unrest and allotment land share and industrialization.[6] Unequal distribution of privately owned land might have been important because large estates monopolizing non-communal land access in their vicinity could become both sites of conflict and at the same time centers of rural-based industrialization, which was often promoted by large estate owners. In order to address this possibility I calculate the parish-level Herfindahl–Hirschman index of serf ownership concentration at the onset of emancipation.[7]

[6]The serfdom incidence is proxied by the share of population in the formerly serf (or mixed-population) settlements taking only the largest settlement on which information is available.

[7]The idea is that the magnitude of past serf ownership should be strongly correlated with land ownership. This index may underestimate the concentration at the owner level because it considers serf holdings (defined as a village or a part of a village) belonging to the same owner as distinct units. At the same time, there is much evidence that at the local level the peasants were likely to directly deal with particular estates or their subunits rather than with their ultimate owners.

The main identifying assumption is that when I control for all the factors listed above, there should be no sizable omitted variable bias left. The primary remaining threat to identification is the possibility that past unrest experience could affect both the location of industrial enterprises and 1905–1906 disturbances. This possibility will be explored below, and overall it seems to be unlikely. Moreover, as explained above, assuming the equal exposure of all the parishes to the incendiary effect of revolutionary events (unknown in the previous decades), we can effectively imitate the difference-in-differences setting, where the parishes are distinguished by their pre-1905 characteristics.

5.3 Empirical Analysis

The description of all the variables is provided in Table 5.1. The maps presented on Figure 5.1 illustrate the spatial distribution of the main variables of interest. Half of the 216 parishes experienced peasant disturbances, but their intensity varied considerably. It can be seen that unlike in the 1902 Poltava-Kharkov uprising case, there is no straightforward association of the spread of disturbances and the main land transportation routes. There is however some spatial correlation of industrialization (positive) and the share of allotment land (negative) with unrest.

The main regression estimation results dealing with the aggregated industrialization level are plotted in Figure 5.2. Irrespective of whether I account only for the fact of unrest (the binary indicator) or its intensity (the number of villages), the effect of industrialization is positive. The coefficient on allotment land share is negative like in the district-level results, but not significant in all specifications.[8].

[8]A possible reason for not seeing a comparably strong relationship between unrest and allotment land share might be the fact that the peasantry of the Kursk province was relatively well endowed with allotment land: the average share was 64% and almost coincided with the median. Even so, the point estimates of its coefficient are always negative and often close to the 5% significance level.

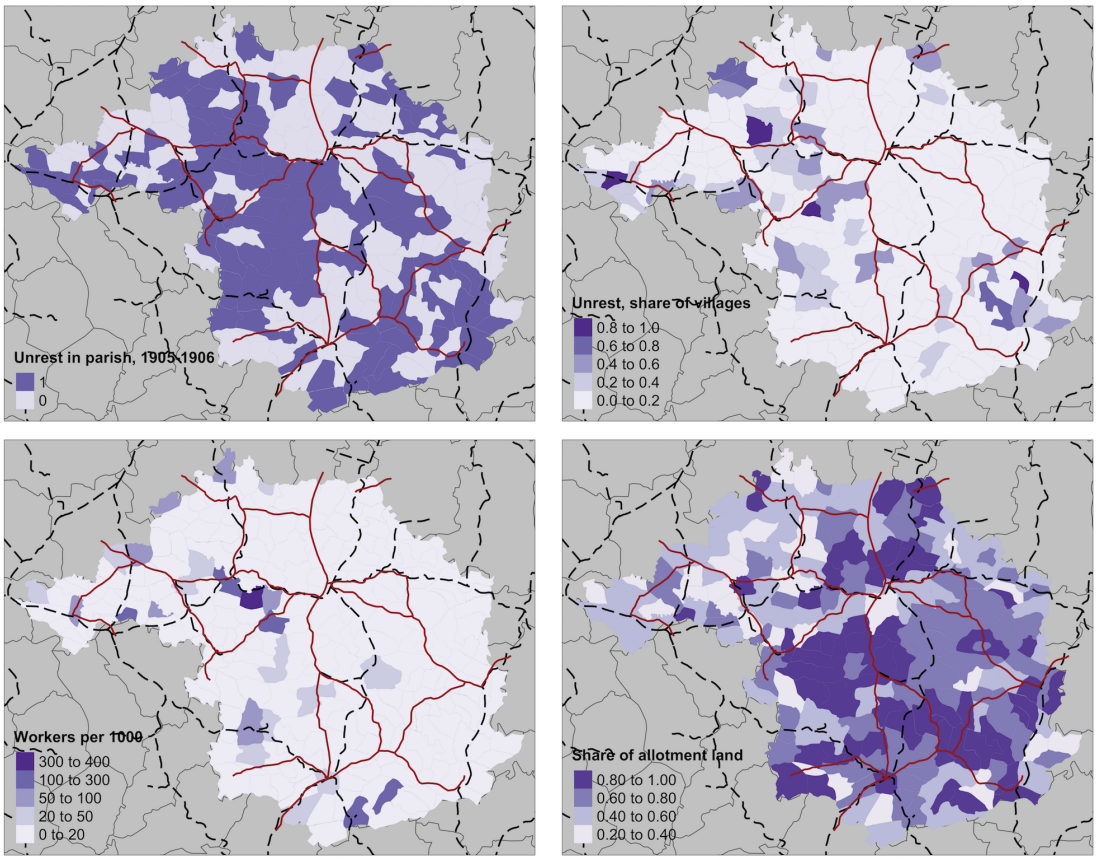

Figure 5.1: The Kursk *gubernia* parishes: peasant unrest (first row) in 1905–1906, industrialization in 1900 (bottom left), and allotment land share in 1880s (bottom right). Black dashed lines denote railroads, and brown solid lines – post roads (only within the Kursk province). Albers equal-area conic projection.

The possible effect of industrialization was quite sizable: an increase in the number of workers per 1000 people by one standard deviation was associated with an almost 10 percentage point increase in the probability of unrest, which constitutes 20% of the average empirical probability. The same shock corresponds to an increase in the number of villages affected by unrest by about 0.4, that is, by 20% of its standard deviation and 30% of its mean. The interaction of the share of allotment land and the number of workers is negative; it is significant only when the dependent variable is the number of villages. In the latter case, in the least industrialized parishes allotment land has

almost no effect on unrest, whereas in the most industrialized parishes one standard deviation increase in its share diminishes the number of villages which took part in the disturbances by half of a standard deviation (one village less). The latter result means that industrialization could not just lead to a higher conflict intensity per se, but it could also make peasants *more* sensitive to land inequality.

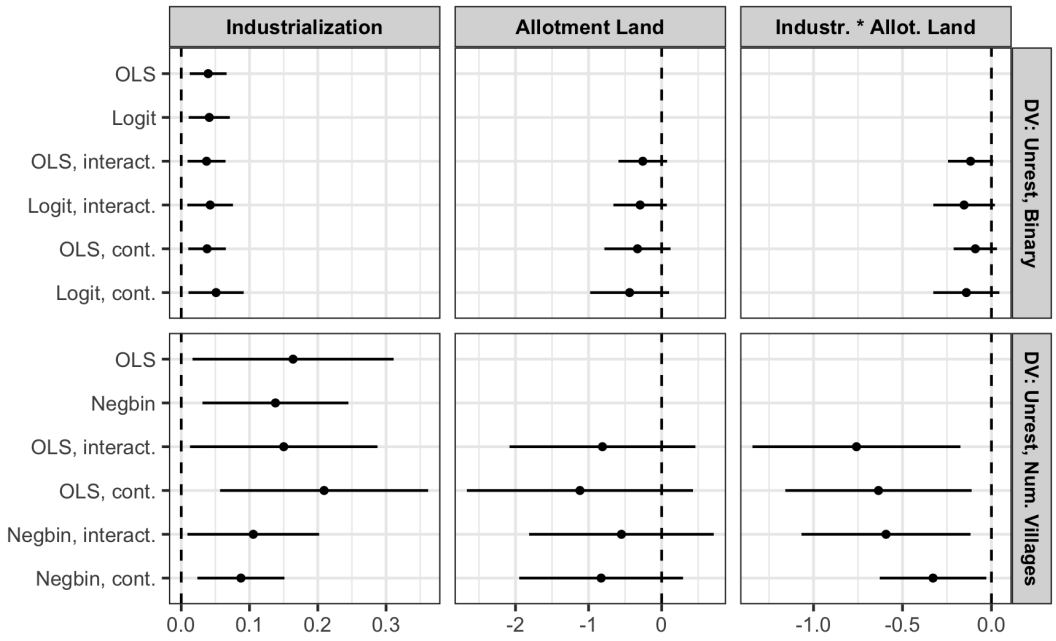

Figure 5.2: 1905–1906 unrest in the Kursk province, regression results by models, coefficients and unrest operationalization. 95% confidence intervals. Industrialization: logarithm of industrial workers in all industries normalized by population (only rural) in the parish; Allotment land: share of allotment land in the parish. Full regression output in Table 5.3.

The breakdown of the number of workers by food and non-food industries[9] (Figure 5.3) emphasizes the strong positive impact of the food industry, whereas all the other industries taken together show a slightly negative but not significant relationship with conflict. As in the previous figure, both the allotment land share and its interaction

[9]Further disaggregation of industries is not appropriate for my analysis given their small individual shares.

with industrialization are negatively, yet not significantly associated with peasant unrest. The model estimates plotted on Figure 5.3 take only binary unrest as the dependent variable, but the results are similar if I use the number of villages.

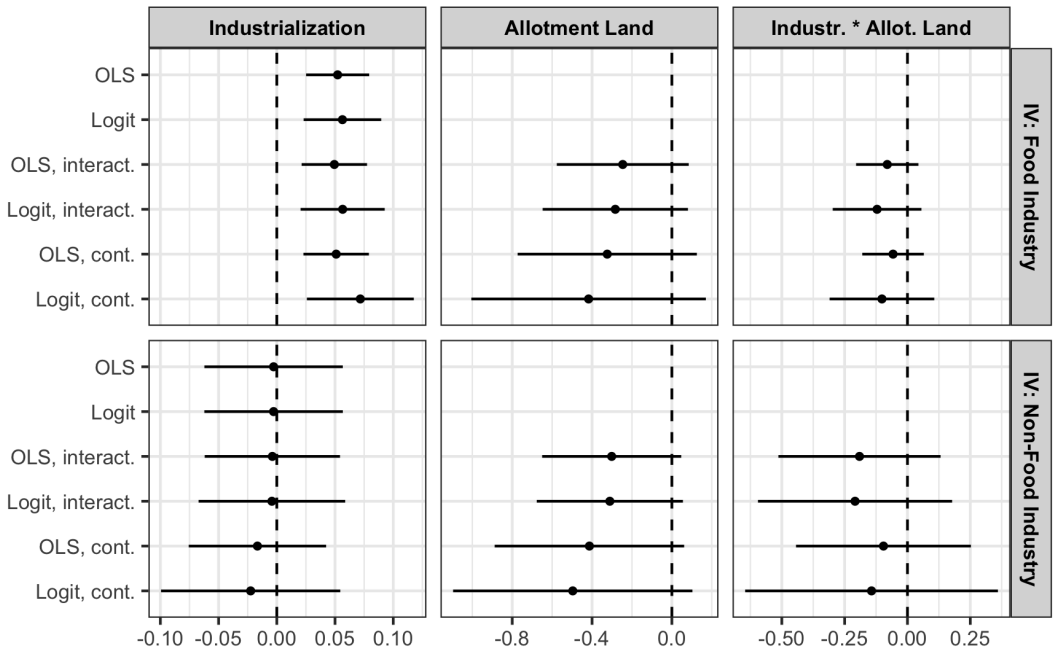

Figure 5.3: 1905–1906 unrest in the Kursk province, regression results by models, coefficients and industry type. The dependent variable is the binary unrest indicator in all specifications. 95% confidence intervals. Industrialization: logarithm of industrial workers in food and non-food industries normalized by population (only rural) in the parish; Allotment land: share of allotment land in the parish. Full regression output in Table 5.4.

In order to address the possibility of unrest spillover across parish borders, in Table 5.5 I provide the regression output from the estimation of a two-stage least squares spatial autoregressive model, which accounts for both the spatial lag and spatial autocorrelation of disturbances (Kelejian and Prucha 2007; for an empirical application in conflict studies see e.g. Geloso and Kufenko 2019). These results fully support the above conclusions: the coefficients on total industry and the food industry are positive and strongly significant. The interactions of industrialization and allotment land share

are everywhere negative, and statistically significant only when the number of affected villages is taken as the measure of unrest. At the same time, the coefficient on allotment land share is negative and statistically significant in some specifications.

The mainstay of rural-based industrialization in the Kursk province, as well as in the adjacent Voronezh province and the Left-bank Ukraine,[10] was the sugar-refining industry. Sugar refineries were relatively sizable productive units equipped with steam-powered machinery and staffed by several hundred workers, and they depended on the delivery of sugar beets from neighboring plantations. Their prominent and controversial role (due to their demand for land and labor) in the local economies could generate particular discontent among the peasantry and made them targets of violent mob attacks, as illustrated by the Poltava case study and confirmed by Miller's study of unrest in the Kursk province.

Table 5.6 presents regression results using log inverted distance (in km) from the parish centroid to the nearest centroid of a parish where a sugar refinery was located as a measure of industrialization. For the parishes with sugar refineries I use an arbitrary distance of 1 km. The coefficients on allotment land share and their interaction with distance to sugar refineries are positive and not significant in most cases, but, in line with the preceding results, proximity to a sugar refinery is strongly positively associated with unrest occurrence and intensity in all specifications.

As was mentioned above, a potential threat to my identification strategy may arise if the occurrence of the 1905–1906 disturbances depended on past unrest legacies, which could have affected industrialization. First of all, the most plausible mechanism could be that the record of conflict in a given parish could create a climate of uncertainty, and consequently suppress investment in industrial establishments. In this case, however,

[10] A historical region located to the east of Dnieper and including the Chernigov and Poltava provinces of the Russian Empire.

the omitted variable bias must be negative, thus underestimating the positive effect of industrialization.

Second, it is possible to directly estimate correlations between past and present unrest and industrialization. In order to evaluate the occurrence of past unrest, I coded the Kursk province data from the same chronicles of peasant movement, which were used for the district-level analysis, and broke them into two periods: 1857–1863, which includes several pre-emancipation years and the first years of the emancipation reform, which were accompanied by a wave of rural conflict, and the period of 1864–1904, the years of relative tranquility in the province (Figure 5.5). The results of bivariate OLS regressions are presented in Table 5.7. The figure shows that the 1905–1906 unrest is not significantly correlated with the 1864–1904 disturbances and only weakly significantly and positively correlated with the 1857–1863 unrest, despite their comparable intensity. There is no correlation between emancipation unrest and industrialization in 1900, even though some of the industrial enterprises, in particular sugar refineries, had been built before the emancipation. Weak positive correlation (at 10% significance level) emerges in 1864–1904, but only for workers in all industries, which might be a sign of growing industrialization already exerting influence on conflict. Overall, there is no clear-cut indication that the legacies of past unrest could severely bias my findings regarding the 1905–1906 peasant disturbances.

5.4 Conclusion

This chapter, examining the determinants of peasant unrest in the Kursk province in 1905–1906, demonstrates that, in accordance with my theory, locally sourced industrialization, in particular the rural-based food industry, is quite strongly associated with unrest. The evidence on the role of land inequality is weaker, which may relate to the fact

that the Kursk province was on average relatively well endowed with allotment land, and the variation between parishes was not that large, whereas the disturbances were widespread. In terms of causal identification, this study helps overcome some shortfalls of the district-level panel analysis in the previous chapters, and overall reaffirms the explanatory power of my theory, despite its apparent limitations.

5.5 Kursk Study: Tables and Figures

Table 5.1: Variable Summary, Kursk Province Parish-Level Study

Statistic	N	Mean	St. Dev.	Min	Max
Unrest in the parish, 1905-1906	216	0.505	0.501	0	1
Number of villages affected by unrest, 1905-1906	216	1.338	1.996	0	12
Log workers per 1000 people, demeaned	216	0.000	2.343	−1.618	6.483
Log food workers per 1000 people, demeaned	216	0.000	2.218	−1.405	6.696
Log non-food workers per 1000 people, demeaned	216	0.000	1.139	−0.472	4.587
Sugar refinery(ies) in the parish	216	0.097	0.297	0	1
Log inverted distance to nearest sugar refinery	214	−2.989	1.106	−4.474	0.000
Share of allotment land, demeaned	216	0.000	0.209	−0.416	0.361
Share of former serfs	216	0.573	0.372	0.000	1.000
Fertile soil	214	0.696	0.394	0.000	1.000
Rairoad dummy	214	0.463	0.500	0.000	1.000
Post road dummy	214	0.467	0.500	0.000	1.000
Terrain ruggedness	214	24.560	8.986	2.994	50.159
River density	214	0.090	0.045	0.000	0.219
Forest share, 1881	216	10.051	2.963	3.812	14.219
Spring temperature deviation, 1905	216	−0.535	0.209	−0.791	−0.115
Summer precipitation deviation, 1905	216	−0.424	1.542	−2.875	0.958
Spring temperature deviation, 1906	216	3.165	0.270	2.854	3.766
Summer precipitation deviation, 1906	216	1.210	1.434	−1.061	2.524
District capital	216	0.079	0.270	0	1
Kursk district	216	0.069	0.255	0	1
Police Uryadnik	216	0.528	0.500	0	1
Police Pristav	216	0.269	0.444	0	1
Distance to nearest military unit	214	59.184	26.677	2.271	121.027
Concentration of serf ownership	216	0.134	0.186	0.000	1.000
Log number of villages, 1880	216	2.616	0.717	0.000	5.004
Log population, 1880s	216	8.908	0.547	7.303	9.897
Log parish area	214	19.128	0.415	17.967	20.245
Unrest in parish in 1857-1863	216	0.259	0.439	0	1
Unrest in parish in 1864-1904	216	0.116	0.321	0	1

Table 5.2: Variable Summary, Kursk Province Study

Variable	Description	Source
Unrest in the parish, 1905-1906	Whether the given parish experienced disturbances in 1905-1906 or not (0: no; 1: yes)	Calculated using Miller 2013, Appendix B. "Villages Listing", pp. 367-383
Number of villages affected by unrest, 1905-1906	Number of villages taking part in disturbances in 1905-1906 in the parish	
Log workers per 1000 people in 1900, demeaned	Logarithm of the number of workers per 1000 people in the parish in 1900 (Box-Cox transformed: to the value of each observation added half of the minimum of the non-zero values of the variable before taking logarithm), demeaned and winsorized at 1%.	Parish-level industrial data is the aggregation of the enterprise-level data on the number of workers from the 1900 list of manufacturing enterprises Ministry of Finance. Department of Trade and Manufactories 1903. Parish population in 1882-1884 is from Kursk Gub. Statistical Bureau 1887
Log food workers per 1000 people in 1900, demeaned	Logarithm of the number of food workers per 1000 people in the parish in 1900...	
Log non-food workers per 1000 people in 1900, demeaned	Logarithm of the number of non-food workers per 1000 people in the parish in 1900...	
Sugar refinery(ies) in the parish in 1905	Dummy for the presence of sugar refineries in the parish (0: no; 1: yes)	Ministry of Finance. Department of Trade and Manufactories 1903, compared with Yezioranskii 1909
Log inverted distance to nearest sugar refinery	Logarithm of 1/(1+distance), where distance is from the parish centroid to the centroid of the nearest parish with a sugar refinery (in *km*).	

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Table 5.2: Variables Summary. Kursk Province Study (continued)

Variable	Description	Source
Share of allotment land, demeaned	Proportion of allotment land (in 1878) in the total amount of land in the parish (in 1882-1884). For several parishes, for which it slightly exceeds 1, the value of 1 is imputed	Allotment land: Kursk Gub. Statistical Bureau 1887; total land: TsSK MVD 1880
Share of former serfs	"The share of population in the formerly serf (or mixed-population) settlements taking only the largest settlement on which information is available."	Calculated on the basisi of TsSK MVD 1880
Fertile soil	Share of fertile soil in the district area. Following Brady and Weil 2002, as cited in Dower et al. 2018, fertile soils include chernozem, greyzem, histosol, kastanozem, phaeozem, and vertisol. The soil type names are given in accordance with the World Reference Base for Soil Resources, a classification used by FAO.	Soil type vector data source: Digital Soil Map of the World, https://worldmap.harvard.edu/data/geonode:DSMW_RdY. Parish polygons: created by the author by digitizing TsSK MVD 1892

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Table 5.2: Variables Summary. Kursk Province Study (continued)

Variable	Description	Source
Rairoad dummy	Whether a railroad passed throuh the given parish (no: 0; yes: 1)	Data on railroad construction: Verkhovskoi 1899, Ministry of Transportation 1914. Railroad vector data: Made with Natural Earth. Free vector and raster map data @ naturalearthdata.com. https://www.naturalearthdata.com/downloads/10m-cultural-vectors/railroads/. Contemporary vector railroad data were matched with the information on the historically built railroad segments. It is presumed that there has been no substantial changes in their location.
Post road dummy	Whether a post road passed throuh the given parish (no: 0; yes: 1)	Post road vector data: "Karta Kurskoi gubernii" (sost. N. Kudriavtsev), digitized by the author
Terrain ruggedness	Terrain Ruggedness Index, parish-level	Terrain elevation data: description in *Global Multi-Resolution Terrain Elevation Data 2010 (GMTED2010): U.S. Geological Survey Open-File Report 2011–1073* N.d.; can be downloaded at https://www.usgs.gov/centers/eros/science/usgs-eros-archive-digital-elevation-global-multi-resolution-terrain-elevation?qt-science_center_objects=0#qt-science_center_objects

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Table 5.2: Variables Summary. Kursk Province Study (continued)

Variable	Description	Source
River density	Length of rivers divided by the parish area	River data: DIVA-GIS Free Spatial Data, https://www.diva-gis.org/gdata
Forest share, 1881	Proportion of forest in the total district land, 1881	TsSK MVD 1884, author's calculations
Spring temperature deviation, 1905	Yearly deviation of the average spring temperature (March-May) from the 1879-1908 district-level average	Global Historical Climatology Network - Monthly (GHCN-M) Version 4 (Last Updated: 05/07/2019), https://www.ncdc.noaa.gov/data-access/land-based-station-data/land-based-datasets/global-historical-climatology-network-monthly-version-4, Menne et al. 2018; author's calculations
Spring temperature deviation, 1906	Yearly deviation of the average spring temperature (March-May) from the 1879-1908 district-level average	
Summer precipitation deviation, 1905	Yearly deviation of the average summer precipitation (June-August) from the 1879-1908 district-level average	
Summer precipitation deviation, 1906	Yearly deviation of the average summer precipitation (June-August) from the 1879-1908 district-level average	
District capital	Whether the district capital located in the parish (0: no; 1: yes)	
Kursk district	Whether the parish is located in the Kursk district (0: no; 1: yes).	
Police Uryadnik	Whether there is a police *uryadnik* in the parish (0: no; 1: yes)	Verzhbitskii 1892, Otdel III, pp. 69-82
Police Pristav	Whether there is a police *pristav* in the parish (0: no; 1: yes)	
Distance to nearest military unit	Distance from the parish centroid to the nearest centroid of the parish within which troops are located as of 1903 (in *km*)	Location of troops: P. Bolotov, "Karta Yevropeiskoi Rossii s graficheskim oboznacheniem dislokatsii voisk", 1903. http://retromap.ru/m/#1419038_z3

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Table 5.2: Variables Summary. Kursk Province Study (continued)

Variable	Description	Source
Concentration of serf ownership	Parish-level Herfindahl–Hirschman index of serf ownership concentration (sum of squared shares of owners in the parish) in 1858	Calculated using Kursk Gub. Stat. Com. 1863, pp. 109-286
Log number of villages, 1880	Logarithm of the number of villages	TsSK MVD 1880
Log population, 1880s	Logarithm of the parish population in 1882-1884	Kursk Gub. Statistical Bureau 1887
Log parish area	Logarithm of the parish area	Parish polygons: created by the author by digitizing TsSK MVD 1892
Unrest in parish in 1857-1863	Whether the given parish experienced unrest in 1857-1863	Chronicles of peasant movement: Okun and Sivkov 1963, Ivanov 1964
Unrest in parish in 1864-1904	Whether the given parish experienced unrest in 1864-1904	Chronicles of peasant movement: Nifontov and Zlatoustovskii 1960, Shapkarin 1959, Zaionchkovskii 1968, Anfimov 1998

Table 5.3: Unrest in Kursk Province in 1905–1906, Industrialization, and Allotment Land

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Dependent Variable:	bin unrest	bin unrest	bin unrest	bin unrest	bin unrest	bin unrest	#villages	#villages	#villages	#villages	#villages	#villages
Method:	OLS	Logit	OLS	Logit	OLS	Logit	OLS	Negbin	OLS	Negbin	OLS	Negbin
Log workers per 1000 people	0.039***	0.041***	0.037***	0.042**	0.038***	0.051**	0.164**	0.138***	0.150**	0.106**	0.209***	0.087***
	(0.013)	(0.015)	(0.014)	(0.017)	(0.014)	(0.020)	(0.074)	(0.053)	(0.069)	(0.048)	(0.076)	(0.032)
Share of allotment land			−0.258	−0.295	−0.331	−0.438			−0.810	−0.550	−1.118	−0.828
			(0.166)	(0.183)	(0.226)	(0.270)			(0.636)	(0.632)	(0.774)	(0.560)
Share of allotment land*Log workers per 1000 people			−0.117*	−0.154*	−0.091	−0.141			−0.759**	−0.593**	−0.635**	−0.328**
			(0.063)	(0.087)	(0.061)	(0.093)			(0.292)	(0.238)	(0.262)	(0.150)
Share of former serfs					0.121	0.151					0.388	0.482
					(0.117)	(0.153)					(0.382)	(0.329)
Fertile soil					0.274**	0.341**					1.344***	1.124***
					(0.111)	(0.144)					(0.441)	(0.284)
Forest share, 1881					0.024	0.029					0.270***	0.216***
					(0.023)	(0.026)					(0.081)	(0.055)
Rairoad dummy					−0.088	−0.109					−0.508**	−0.316*
					(0.068)	(0.086)					(0.249)	(0.185)
Post road dummy					−0.117*	−0.140*					−0.306	−0.251
					(0.069)	(0.084)					(0.269)	(0.181)
Terrain ruggedness					0.008	0.010					0.029	0.014
					(0.006)	(0.007)					(0.020)	(0.015)
River density					0.012	−0.077					1.656	1.350
					(0.690)	(0.955)					(2.585)	(2.256)
Spring temperature deviation, 1905					0.716*	0.873*					4.915***	3.492***
					(0.384)	(0.508)					(1.410)	(1.073)
Summer precipitation deviation, 1905					0.606	0.388					−1.808	−1.788
					(2.335)	(3.078)					(9.467)	(5.900)
Spring temperature deviation, 1906					−0.667**	−0.829*					−4.513***	−3.483***
					(0.319)	(0.432)					(1.105)	(0.830)
Summer precipitation deviation, 1906					−0.617	−0.376					1.845	1.814
					(2.503)	(3.308)					(10.201)	(6.317)
District capital					−0.161	−0.182					−1.045***	−0.625***
					(0.128)	(0.149)					(0.354)	(0.206)
Kursk district					−0.111	−0.161					−0.558	−0.367
					(0.156)	(0.198)					(0.579)	(0.358)
Police uryadnik					−0.023	−0.029					−0.256	−0.201
					(0.066)	(0.085)					(0.250)	(0.178)
Police pristav					0.137*	0.157*					0.372	0.392
					(0.075)	(0.091)					(0.294)	(0.242)
Distance to military unit					0.001	0.001					0.009	0.006
					(0.002)	(0.003)					(0.008)	(0.006)
Concentration of serf ownership					0.242	0.291					−0.146	0.235
					(0.196)	(0.253)					(0.725)	(0.484)
Log number of villages, 1880					−0.026	−0.035	0.057	0.039	0.002	−0.023	0.013	−0.013
					(0.064)	(0.076)	(0.162)	(0.156)	(0.158)	(0.146)	(0.183)	(0.161)
Log population, 1880s	−0.035	−0.038	−0.010	−0.019	0.037	0.035					0.585**	0.405**
	(0.058)	(0.062)	(0.064)	(0.069)	(0.076)	(0.104)					(0.286)	(0.174)
Log parish area					0.141	0.172					0.080	0.359
					(0.099)	(0.126)					(0.361)	(0.254)
Num. obs.	216	216	216	216	214	214	216	216	216	216	214	214
R^2	0.035		0.059		0.195		0.037		0.078		0.282	
Adj. R^2	0.026		0.041		0.098		0.028		0.061		0.196	
Log Likelihood		-145.812		-142.757		-124.925		-338.218		-335.369		-305.805
Deviance		291.624		285.514		249.850		209.719		210.909		216.697
AIC		297.624		295.514		297.850		684.437		682.738		661.610
BIC		307.750		312.390		378.633		697.938		702.990		745.760

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Heteroskedasticity-robust standard errors in parentheses.

Table 5.4: Unrest in Kursk Province in 1905–1906, Food and Non-Food Industries

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Method:	bin unrest OLS	bin unrest Logit	bin unrest OLS	bin unrest Logit	bin unrest OLS	bin unrest Logit	bin unrest OLS	bin unrest Logit	bin unrest OLS	bin unrest Logit	bin unrest OLS	bin unrest Logit
Log food workers per 1000 people	0.052***	0.056***	0.049***	0.057***	0.051***	0.072***						
	(0.014)	(0.017)	(0.014)	(0.018)	(0.014)	(0.023)						
Log non-food workers per 1000 people							−0.003	−0.003	−0.004	−0.004	−0.017	−0.022
							(0.030)	(0.030)	(0.029)	(0.031)	(0.029)	(0.038)
Share of allotment land			−0.246	−0.283	−0.324	−0.417			−0.302*	−0.311*	−0.413*	−0.497*
			(0.165)	(0.182)	(0.225)	(0.294)			(0.174)	(0.183)	(0.237)	(0.300)
Share of allotment land*Log food workers per 1000 people			−0.080	−0.121	−0.057	−0.102						
			(0.062)	(0.088)	(0.061)	(0.104)						
Share of allotment land*Log non-food workers per 1000 people									−0.191	−0.209	−0.095	−0.143
									(0.161)	(0.193)	(0.174)	(0.251)
Share of former serfs					0.109	0.143					0.095	0.126
					(0.117)	(0.146)					(0.117)	(0.141)
Fertile soil					0.269**	0.340**					0.234**	0.276*
					(0.113)	(0.147)					(0.112)	(0.141)
Forest share, 1881					0.025	0.030					0.025	0.028
					(0.023)	(0.028)					(0.023)	(0.027)
Rairoad dummy					−0.099	−0.124					−0.058	−0.070
					(0.067)	(0.084)					(0.068)	(0.082)
Post road dummy					−0.109	−0.134					−0.128*	−0.149*
					(0.070)	(0.086)					(0.070)	(0.082)
Terrain ruggedness					0.008	0.009					0.009	0.011
					(0.006)	(0.007)					(0.006)	(0.007)
River density					−0.099	−0.249					0.078	0.101
					(0.690)	(0.909)					(0.716)	(0.875)
Spring temperature deviation, 1905					0.715*	0.885*					0.666*	0.781*
					(0.380)	(0.503)					(0.393)	(0.475)
Summer precipitation deviation, 1905					0.804	0.536					0.895	0.866
					(2.320)	(2.835)					(2.411)	(2.871)
Spring temperature deviation, 1906					−0.668**	−0.855**					−0.589*	−0.692*
					(0.314)	(0.418)					(0.329)	(0.396)
Summer precipitation deviation, 1906					−0.836	−0.542					−0.918	−0.878
					(2.486)	(3.043)					(2.585)	(3.081)
District capital					−0.175	−0.204					−0.091	−0.101
					(0.124)	(0.137)					(0.140)	(0.166)
Kursk district					−0.094	−0.145					−0.113	−0.149
					(0.152)	(0.178)					(0.164)	(0.183)
Police uryadnik					−0.033	−0.045					−0.006	−0.014
					(0.066)	(0.084)					(0.069)	(0.086)
Police pristav					0.138*	0.163*					0.165**	0.187**
					(0.074)	(0.088)					(0.077)	(0.090)
Distance to military unit					0.001	0.001					0.001	0.001
					(0.002)	(0.003)					(0.002)	(0.003)
Concentration of serf ownership					0.271	0.330					0.335*	0.404*
					(0.187)	(0.239)					(0.187)	(0.227)
Log number of villages, 1880					−0.019	−0.025					−0.052	−0.061
					(0.064)	(0.087)					(0.063)	(0.078)
Log population, 1880s	−0.030	−0.035	−0.002	−0.010	0.052	0.046	−0.033	−0.033	−0.000	−0.000	0.046	0.051
	(0.058)	(0.063)	(0.063)	(0.069)	(0.076)	(0.101)	(0.061)	(0.061)	(0.067)	(0.068)	(0.077)	(0.095)
Log parish area					0.125	0.156					0.178*	0.221*
					(0.100)	(0.127)					(0.095)	(0.120)
Num. obs.	216	216	216	216	214	214	216	216	216	216	214	214
R^2	0.055		0.070		0.207		0.001		0.020		0.164	
Adj. R^2	0.046		0.053		0.111		-0.008		0.001		0.063	
junal Log Likelihood		-143.557		-141.436		-123.152		-149.560		-147.521		-129.249
Deviance		287.115		282.871		246.304		299.121		295.042		258.498
AIC		293.115		292.871		294.304		305.121		305.042		306.498
BIC		303.240		309.748		375.088		315.247		321.918		387.281

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Heteroskedasticity-robust standard errors in parentheses.

Table 5.5: Spatial Two-Stage Least Squares, Kursk Province Unrest in 1905–1906

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Dependent variable:	#villages	#villages	#villages	bin unrest	bin unrest	bin unrest	bin unrest	bin unrest	bin unrest	bin unrest	bin unrest	bin unrest
Log workers per 1000 people	0.038***	0.035***	0.039***	0.158**	0.143**	0.209***						
	(0.012)	(0.013)	(0.011)	(0.066)	(0.064)	(0.064)						
Log food workers per 1000 people							0.051***	0.048***	0.051***			
							(0.012)	(0.013)	(0.013)			
Log non-food workers per 1000 people										−0.004	−0.007	−0.013
										(0.024)	(0.022)	(0.024)
Share of allotment land		−0.278**	−0.277		−1.128*	−1.272		−0.281**	−0.258		−0.358**	−0.398
		(0.135)	(0.251)		(0.609)	(0.995)		(0.142)	(0.253)		(0.142)	(0.249)
Share of allotment land*Log workers per 1000 people		−0.116*	−0.100*		−0.730***	−0.648**						
		(0.062)	(0.055)		(0.272)	(0.260)						
Share of allotment land*Log food workers per 1000 people								−0.076	−0.069			
								(0.065)	(0.057)			
Share of allotment land*Log non-food workers per 1000 people											−0.204	−0.114
											(0.178)	(0.182)
Share of former serfs			0.116			0.359			0.103			0.092
			(0.129)			(0.534)			(0.129)			(0.134)
Fertile soil			0.264**			1.245***			0.255**			0.232*
			(0.131)			(0.458)			(0.129)			(0.134)
Forest share, 1881			0.011			0.186***			0.011			0.016
			(0.014)			(0.072)			(0.013)			(0.017)
Rairoad dummy			−0.084			−0.547**			−0.095			−0.052
			(0.075)			(0.235)			(0.075)			(0.079)
Post road dummy			−0.125**			−0.360			−0.117**			−0.138**
			(0.052)			(0.222)			(0.052)			(0.054)
Terrain ruggedness			0.008*			0.030*			0.008*			0.009**
			(0.004)			(0.016)			(0.004)			(0.005)
River density			−0.027			1.463			−0.140			0.039
			(0.712)			(2.844)			(0.700)			(0.734)
Spring temperature deviation, 1905			0.507**			3.657***			0.492**			0.492**
			(0.221)			(1.091)			(0.220)			(0.233)
Summer precipitation deviation, 1905			0.926			2.763			1.014			1.616
			(1.676)			(6.213)			(1.653)			(2.022)
Spring temperature deviation, 1906			−0.469**			−3.202***			−0.464**			−0.405**
			(0.190)			(0.991)			(0.187)			(0.190)
Summer precipitation deviation, 1906			−0.954			−2.994			−1.053			−1.690
			(1.791)			(6.665)			(1.767)			(2.169)
District capital			−0.141			−0.958***			−0.154			−0.074
			(0.129)			(0.269)			(0.127)			(0.131)
Kursk district			−0.081			−0.327			−0.067			−0.074
			(0.092)			(0.354)			(0.092)			(0.109)
Police uryadnik			−0.026			−0.269			−0.035			−0.012
			(0.076)			(0.229)			(0.077)			(0.079)
Police pristav			0.130*			0.311			0.132*			0.156**
			(0.072)			(0.337)			(0.071)			(0.069)
Distance to military unit			0.001			0.010			0.001			0.002
			(0.002)			(0.008)			(0.002)			(0.002)
Concentration of serf ownership			0.241			−0.177			0.274			0.313**
			(0.177)			(0.528)			(0.168)			(0.157)
Log number of villages, 1880	0.000	−0.012	−0.022		−0.023	−0.035	0.008	−0.015	−0.013	−0.002	−0.035	−0.056
	(0.047)	(0.049)	(0.063)		(0.143)	(0.184)	(0.048)	(0.047)	(0.063)	(0.050)	(0.049)	(0.061)
Log population, 1880s					0.116	0.577**	−0.028	0.020		−0.035	0.036	0.061
					(0.286)	(0.252)	(0.080)	(0.087)		(0.088)	(0.092)	(0.072)
Log parish area			0.156*			0.145			0.145			0.178*
			(0.089)			(0.365)			(0.090)			(0.091)
Spatial lag	0.023	0.039	0.042*	0.035	0.067	0.058	0.026	0.034	0.042*	0.012	0.043	0.046*
	(0.038)	(0.032)	(0.026)	(0.056)	(0.043)	(0.038)	(0.036)	(0.034)	(0.025)	(0.039)	(0.033)	(0.025)
Num. obs.	214	214	214	214	214	214	214	214	214	214	214	214
R^2	0.043	0.068	0.185	0.058	0.103	0.260	0.064	0.081	0.197	0.011	0.034	0.152

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Non-parametric heteroskedasticity and spatial autocorrelation errors (Kelejian and Prucha 2007, implemented via R package *sphet* (Piras et al. 2010)) in parentheses. Queen's case contiguity spatial weights matrix for the spatial lag, and Eucledian distance measure (up to the third tercile of closest parish centroids) for the variance-covariance matrix.

Table 5.6: Kursk Province Unrest in 1905–1906 and Sugar Refinery Location

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Dependent variable:	bin unrest	bin unrest	bin unrest	bin unrest	bin unrest	bin unrest	#villages	#villages	#villages	#villages	#villages	#villages
Method:	OLS	Logit	OLS	Logit	OLS	Logit	OLS	Negbin	OLS	Negbin	OLS	Negbin
Log inv. min. distance to sugar refinery	0.083***	0.090**	0.081***	0.088**	0.084***	0.112**	0.307*	0.248**	0.286*	0.243**	0.404**	0.228***
	(0.029)	(0.036)	(0.029)	(0.036)	(0.031)	(0.045)	(0.174)	(0.117)	(0.167)	(0.114)	(0.180)	(0.064)
Share of allotment land			0.120	0.158	−0.154	−0.097			−0.600	0.071	−2.224	−0.951
			(0.390)	(0.500)	(0.417)	(0.653)			(1.802)	(1.207)	(1.791)	(0.778)
Sh. allot. land*Log inv. min. dist. to sugar refinery			0.127	0.140	0.067	0.104			0.026	0.263	−0.314	0.053
			(0.126)	(0.158)	(0.129)	(0.194)			(0.597)	(0.458)	(0.570)	(0.268)
Log number of villages, 1880					−0.035	−0.044	0.068	0.063	0.046	0.052	−0.031	−0.039
					(0.065)	(0.076)	(0.163)	(0.165)	(0.167)	(0.174)	(0.188)	(0.178)
Log population, 1880s	−0.022	−0.022	0.017	0.018	0.077	0.089					0.792**	0.588***
	(0.060)	(0.062)	(0.063)	(0.066)	(0.077)	(0.105)					(0.328)	(0.187)
Controls	N	N	N	N	Y	Y	N	N	N	N	Y	Y
Num. obs.	214	214	214	214	214	214	214	214	214	214	214	214
R^2	0.035		0.048		0.187		0.028		0.033		0.249	
Adj. R^2	0.026		0.030		0.088		0.019		0.015		0.158	
Log Likelihood		-144.384		-142.957		-126.117		-337.691		-336.970		-307.514
Deviance		288.767		285.913		252.234		208.498		208.528		211.731
AIC		294.767		295.913		300.234		683.381		685.939		665.027
BIC		304.865		312.743		381.017		696.845		706.135		749.177

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Heteroskedasticity-robust standard errors in parentheses.

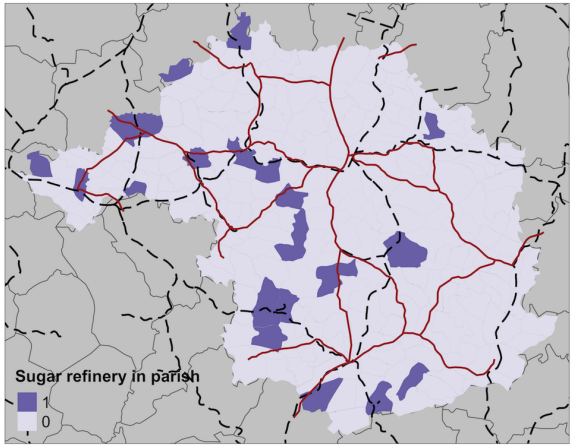

Figure 5.4: The Kursk province: parishes with sugar refineries in 1900. Albers equal-area conic projection.

Table 5.7: Unrest in Kursk Province in 1905–1906, Industrialization, and Past Unrest

Dependent variable:	(1) Unrest, binary, 1905–06	(2) Unrest, binary, 1905–06	(3) Log worker pc, 1900	(4) Log food worker pc, 1900	(5) Log worker pc, 1900	(6) Log food worker pc, 1900
Unrest in 1857–1863, binary	0.19*		0.59	0.66		
	(0.08)		(0.36)	(0.34)		
Unrest in 1864–1904, binary		0.06			1.05*	0.78
		(0.11)			(0.49)	(0.47)
Num. obs.	216	216	216	216	216	216
R^2	0.03	0.00	0.01	0.02	0.02	0.01
Adj. R^2	0.02	-0.00	0.01	0.01	0.02	0.01

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$. Heteroskedasticity-robust standard errors in parentheses.

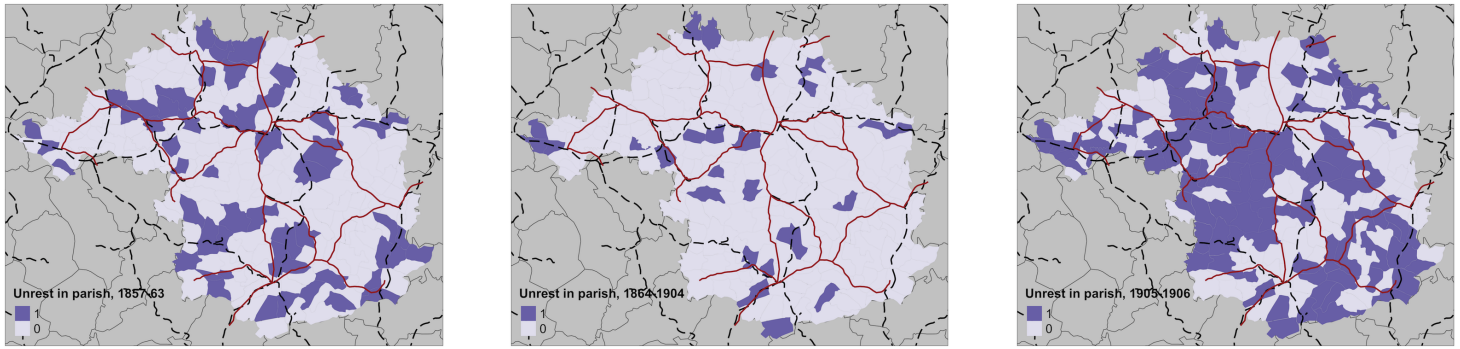

Figure 5.5: The Kursk province: comparison of peasant unrest occurrence across different periods: 1857–1863, 1864–1904, 1905–1906. Albers equal-area conic projection.

Conclusion

This dissertation offers a novel theory linking industrialization, land inequality, and peasant unrest and empirically tests it using quantitative data on the late Russian Empire. I develop my theory based on the historical and political economy literatures that are focused on problems of developing societies, a qualitative case study of a prominent peasant uprising in the Poltava and Kharkov provinces in 1902, and a formal model describing peasant-landlord relations in a stylized setting of a redistributional conflict.

I argue that at the local level industrialization can have an ambiguous effect on the rural conflict, and focus my attention on the two main causal mechanisms of its influence: the absorption of surplus labor relieving pressure on land and conflict potential on the one hand, and competition with peasant agriculture for scarce resources, such as arable land, forests and pastures, on the other hand. When the latter mechanism prevails, we can expect not only more unrest, but also a greater sensitivity of peasants towards land inequality. The document-based case of the Poltava–Kharkov uprising, among other factors caused by worsening land rent terms offered by large commercializing and industrializing estates surrounded by peasant communes dependent on subsistence farming, illustrates these mechanisms at work.

In order to test these theoretical implications I have collected an original dataset covering the years 1879–1913, which draws on a wide range of published historical sources, previously unexplored or only partly explored. It includes the district-level data on peasant unrest, coded from a multi-volume chronicle compiled in Soviet times; the number of industrial workers and output volume, aggregated from the lists of individual en-

terprises for various years; and land distribution from the 1877 and 1905 land censuses. My another dataset, building on Miller 2013, contains data on peasant unrest in 1905–1906, and a broad range of socio-economic and demographic indicators for the previous years for the Kursk province located in the fertile black-soil area in Southern Russia.

My quantitative analysis of the effect of land inequality and industrialization on peasant unrest using the district-level panel data for the European part of the Russian Empire in 1879–1904 and parish-level cross-sectional data for the Kursk province in 1905–1906 provides the following results: As expected theoretically, the association of land inequality and unrest is positive: a lower share of allotment land (in communal ownership of the peasants), as opposed to state and private land, is correlated with higher peasant unrest. The relationship between overall industrialization and peasant unrest is often negative, but typically insignificant, whereas its interaction with land inequality is positive, which means that it could decrease the negative association between allotment land and conflict, reducing the peasants' sensitivity towards the availability of land due to the prevalence of the labor absorption effect.

Disaggregation by industries lends support to the theoretical intuition concerning the relative importance of the mechanisms through which industrialization and inequality affect unrest. Using available statistical and anecdotal evidence, I develop a classification of industries with respect to their reliance on locally sourced raw materials for which they could compete with local agriculture. Estimation of regression models for various industries lends support to my theoretical conjectures. In particular, the presence of a food processing industry, more firmly embedded in the rural agricultural economy, and directly competing with the local peasants for land and other factors of production was positively associated with unrest, and its interaction with allotment land share was negative in many specifications. In contrast, the converse was true for the textiles industry, supplied by imported or Central Asian cotton. These two industries

together accounted for most of the output and employment in Russian manufacturing.

The results of the district-level study, due to their occasional weakness, lack of robustness to various specifications, inconsistency, and some unresolved identification problems provide substantial, but qualified support for my theoretical expectations. The design of the Kursk province study helps alleviate some of these issues, and its findings are in line with the main takeaways of my district-level analysis and theoretical implications. The fact that the two analyses deal with different units of observation and time periods, but still stand in broad agreement with each other, suggests strong support in favor of my theory and the causal interpretation of the observed relationships.

Assessing the importance of these results, it is necessary to acknowledge that ideas regarding the controversial influence of capitalist development on the agrarian sector are obviously not new. In Russia, the purported destabilizing effects of market-based development were perceived by both the elites and the educated society at large (Kingston-Mann 1998). Whereas Slavophiles, "populists", and many conservative government officials were in favor of the preservation of the institution of peasant land commune, be it for the purpose of sticking to the imagined organic tradition of the Russian people, direct transition to socialism, or maintenance of internal stability, Marxists, along with such proponents of capitalist development as Witte or Stolypin, hailed the commune's disintegration as a necessary part of economic, social, and political progress. Yet, there was strong awareness of the conflicts arising from the economic transformation in a slowly changing institutional context.[11]

[11]For example, the 1905–1907 mass peasant unrest made Lenin reconsider his views on the depth of the penetration of capitalism in the countryside. The fact that attacks of peasants on landlords, going back to the emancipation and pre-emancipation times, far surpassed conflicts among peasants, which were expected to be intensified by the socio-economic stratification produced by the development of capitalism, showed that older institutions and practices were persistent, and their interaction with market development could only amplify peasant discontent. As Lenin wrote, "... a new vampire—capital—steps on the Russian peasants under the conditions when the peasants' hands and feet are bound by serfowner-landlords, serfowner, landlord, Tsarist autocracy" (Lenin 1968 [1912], p. 197). During Stalin's rule the Soviet historical scholarship of the Russian Empire emphasized its high degree of capitalist "mat-

Similar ideas, bearing a relationship to Marxist thinking, were applied by various scholars in the analysis of the economic history of advanced Western Economies and ongoing processes in developing countries, and they are present in the works of Barrington Moore, James Scott, Eric Hobsbawm, Karl Polanyi, Samuel Huntington, and many others.

The novelty of my approach is to formulate a theory with observable implications, grasping the most important aspects of the relationships between industrialization and peasant farming at the local level, and to conduct a quantitative empirical test, involving rich data on peasant disturbances, industrialization, and land inequality. It is one of the first works directly engaging with historical scholarship on the analysis of rural conflict, while applying research methods adopted from modern social sciences in order to verify its conclusions.

I have shown that land redistribution and industrial development in the most advanced sectors, such as textiles, could have potentially stabilized the countryside in the Russian Empire. It makes sense to put these findings into the context of the discussion regarding the role of land reforms in promoting economic development, in particular, in Asian countries (e.g. Kay 2002, Studwell 2013, Grabowski 2002). The pre-industrialization land reforms in South Korea and Taiwan after World War II led to the effective elimination of large landlords and the creation of a large class of productive smallholders, which helped generate agricultural surplus in order to finance industrialization, maintain social stability, and provide a well-timed flow of labor from agricul-

uration" in order to prove the inevitability of the Socialist Revolution arising from objective social and economic processes, in the spirit of Lenin's earlier views. In the 1950s and 1960s "revisionist" Soviet historians developed a much more nuanced and better documented picture of "simultaneous co-existence, interaction, interweaving and competition of precapitalist, proto-capitalist and fully capitalist forms of economic organization and production—and their reflection in the increasing complexity of the fabric of social relations—that defined Russia's national profile on the very eve of the October Revolution" (Miller 2013, p. 21). The chronicles of the "peasant movement" used in this dissertation are one of the products of their extensive data collection and analysis effort.

ture to industry (Kay 2002). Massive post-World War II land redistribution in Japan and China had similar effects (although in China only in the years preceding farm collectivizaton in the second half of the 1950s, and then after 1978; see Studwell 2013).

Before land reform, much of the rural population of these countries faced problems similar to what is described in my dissertation: stagnating or slowly growing agricultural productivity; a large and expanding population of sharecropper tenants, depending on large landlords for their subsistence; insecure terms of rent and land rents rising due to increasing demand, which led to lower investment (Studwell 2013). This state of affairs not only perpetuated economic backwardness, but also sparked tensions and political and social instability in the countryside.

For example, by the mid-1940s South Korea, at that time a Japanese colony, was a predominantly agrarian country (4/5 of the population was rural) with heavily concentrated landholding: 5% of households owning about 40% of land, and the majority of the peasants living on sharecropping tenancy or hired labor for subsistence. By 1965, as a result of the program according to which "all tenants were entitled to ownership of the land they farmed" (Kay 2002, p. 1079), 70% of farm households owned land, and the tenancy rate fell to 7%.[12]

This transition to small-scale land ownership was accompanied by growing agricultural productivity (especially of rice), which occurred under strict political and economic control of the countryside by the state. By coercive introduction of improved seeds and agricultural techniques, and by keeping agricultural output sale prices low relative to inputs, the authorities accumulated a surplus which helped finance industrialization. Suppressed rural living standards stimulated the relocation of labor from agriculture to the booming industrial sector. Successful state-led export-oriented industrialization was

[12]However, it substantially increased thereafter, to 30.5% of all land in 1986, but Japan's and Taiwan's tenancy rates remained very low (Kay 2002, p. 1079).

able to accommodate this flow of workers and increase overall well-being. Even though large-scale capital-intensive farming could have reached higher productivity levels, it would have unduly neglected rural labor, an abundant factor of production (Studwell 2013), which could have enhanced disaffection on the part of the peasantry.

Most Latin American countries, with their lackluster and poorly timed land reforms stand in stark contrast to East Asia (Kay 2002). Since the 1930s Latin American, and since the 1950s Central American countries started to promote import substitution industrialization (ISI), but the outreach of the state in the countryside, typically dominated by large landowners relying on hired labor, was limited. Therefore, with the exception of Mexico and Bolivia, land reforms, which started in the 1960s, came after, not before industrialization and were restricted in scope and sometimes reversed. This development pattern had several negative consequences. First, rampant poverty, inequality and landlord-peasant conflict persisted, often taking violent forms. One of the recent examples is the land reform in Brazil, which started in 1988, and has been accompanied by numerous land invasions by the peasantry and organized violent responses by landowners (Albertus, Brambor and Ceneviva 2018). Second, the landlords not only successfully resisted land redistribution, but also aggravated the failure of ISI, preventing redistribution from the agricultural sector. Slow industrialization was unable to absorb rural-urban migration, which led to the proliferation of slums and unemployment.

Latin America provides a lot of useful evidence on interactions between development, disparity in land ownership and usage, and conflict. The dispossession of the peasantry due to the increasing commercial value of land, could also be found in late 19th century Mexico, where numerous agrarian conflicts were caused by "a process of anticipatory usurpation of Indian communal lands and of the public domain by the nation's latifundist, and increasingly entrepreneurial, ruling class" (Coatsworth 1981, p. 174). In Colombia's frontier, conflict between small-holder settlers on public lands and

large landowners and speculators interested in commercial export-oriented exploitation of land was strong in 1870s–1930s, and was only temporarily resolved by a compromise law in 1936 (LeGrand 1986). The most conflict-ridden regions were also prominent in the 1948–1965 civil and later guerilla movements, which seems to have come to an end only in recent years. Frontier zones, experiencing similar land disputes, were also in the center of conflict in other Latin American countries, including struggles in Central America, Cuba and Brazil.

Paige 1978 considers a broad array of cases from the developing world, arguing that relative positions of landlords and peasants are major determinants of political and social dynamics. The situation when the "upper agrarian classes" practice labor-intensive agriculture providing their workers with small subsistence plots (e. g. plantations in Brazil and El Salvador), allowing for a "combination of small independent cultivators and large estates in close proximity", or rely on sharecropping tenancy involving migrant laborers, can be particularly explosive. On the other hand, if agrarian elites engage in capital-intensive farming (e.g. plantations employing wage labor) or effectively move from land ownership to agrarian and commercial capital, with land getting owned by small landholders combining both cash and subsistence production (e. g., tobacco-growing regions of Puerto-Rico), then there is more opportunity for peaceful reform and sharing of profits from increasingly productive agriculture.

As Paige notes "[t]he sharecropper has no legal right to the land and may not even have a stable claim to occupy it in practice" (Paige 1978 p. 60). With an export market coming, sharecroppers can be exploited by landlords, middlemen, and moneylenders even more, as was experienced by peasants of Myanmar, Vietnam, India, and Indonesia.[13] My research shows that the insecurity of land tenure aggravated by industrial-

[13]Banerjee and Iyer 2005 consider the case of post-colonial India, and shows that the areas where the British in the colonial times preserved the landlord-based system of taxation and land tenure (in contrast to directly ruled individual smallholders) underinvested in "health, education, and agricultural technol-

ization and the commercialization of agriculture did provoke rural conflicts in the Russian Empire under conducive circumstances. It can be seen from the Poltava–Kharkov uprising case study that many peasants rented land on potentially even more burdensome terms than sharecropping—namely working part time on the landlord's land. At that time many large estates employed seasonal agricultural workers (Edelman 1987), but tensions with the local peasantry, who were neither independent smallholders nor landless agricultural workers, were sometimes strong enough to escalate into an open confrontation, theft and violence.

In the case of the Russian Empire, with its relatively weak state capacity, rural conflict turned out to be particularly pernicious and able to rise to extreme levels in a situation of political instability. Moreover, some forms of industrial development, such as, for example, building of sugar refineries, could interact with still prevalent subsistence farming and land inequality, producing peasant discontent and unrest.

The above comparisons do not aim to justify the expropriation of large landholders and the imposition of authoritarian state control,[14] but they do show the range of possible alternatives and their outcomes. Of course, the design and implementation of land reforms is unlikely to be exogenous. For example, in Japan, South Korea, and Taiwan, the ground for the overthrow of large landlords and their replacement with smallholders was prepared by previous agricultural commercialization and a successful social movement of tenants for better terms of leasing, which was facilitated by state-controlled mediation and other dispute resolution institutions (Grabowski 2002). By the end of World War II the landlords had already been considerably weakened as a class.

Russian large landlords enjoyed much less power and land property concentration

ogy" as a result of the persistent "conflictual environment" (p. 1191).

[14]Interestingly, Latin American and broader international experience demonstrates that massive land redistribution is more likely under authoritarian regimes, as a result of intra-elite conflict, rather than under democracies, which are unable to overcome the influence of large landowners (Albertus 2015).

than their Latin American counterparts, but that failed to ease rural conflict or create room for negotiations and compromise. The state was unwilling either to reinforce the landlords' influence in the countryside, or to reliably protect them from peasant incursions. The redistribution of large private landholding in favor of smallholders was also rejected by the elites. Another critical factor of successful land reform—high state capacity and motivated bureaucracy—was lacking, which additionally narrowed the range of viable policies. The commercialization and industrialization of the economy under these conditions served to intensify rural conflicts.

It should be emphasized that I do not claim that industrialization or its interaction with inequality should be considered the main explanation of peasant discontent and unrest in the late Russian Empire, which ended up in major social and political upheaval. Among the factors responsible for the genesis of the Russian revolution in the countryside we can name both structural determinants, such as weak fiscal, administrative, and policing capacity and rapid population growth, as well as contingent occurrences, such as exhausting and failed wars and inept responses of the ruling regime to popular claims. Even when we talk about modernization processes, one can claim that their main channel of influence was through the rising expectations and a growing sense of "relative deprivation," as a consequence of growing literacy, education, social mobility, and material well-being (Mironov 2012).

That said, there is ample historical, economic, sociological, and anthropological evidence of the validity of the issues considered in my dissertation with respect to the Russian Empire and in a much broader international context. There is no doubt that the problem of disparities produced by economic development and ensuing conflict both in historical perspective and in the contemporary world is worthy of more extensive study and discussion.

Bibliography

Acemoglu, Daron and James A Robinson. 2000. "Political Losers as a Barrier to Economic Development." *The American Economic Review* 90(2):126–130.

Acemoglu, Daron and James A Robinson. 2006. "Economic Backwardness in Political Perspective." *American Political Science Review* 100(1):115–131.

Acemoglu, Daron, Simon Johnson and James A Robinson. 2005. "Institutions as a Fundamental Cause of Long-run Growth." *Handbook of Economic Growth* 1:385–472.

Afonina, G. M. 1995. *Kratkiie svedeniia o razvitii otechestvennykh zheleznykh dorog s 1838 po 1990 g. [Concise Information on the Development of Domestic Railroads from 1838 to 1990]*. Moscow: MPS RF, TsNTBZhTR.

Aidt, Toke S and Raphaël Franck. 2015. "Democratization under the Threat of Revolution: Evidence from the Great Reform Act of 1832." *Econometrica* 83(2):505–547.

Aidt, Toke Skovsgaard, Gabriel Leon and Max Satchell. 2017. "The Social Dynamics of Collective Action: Evidence from the Captain Swing Riots, 1830-31.".

Albertus, Michael. 2015. *Autocracy and Redistribution*. Cambridge University Press.

Albertus, Michael. 2017. "Landowners and Democracy: The Social Origins of Democracy Reconsidered." *World Politics* 69(2):233–276.

Albertus, Michael. 2020. "Land Reform and Civil Conflict: Theory and Evidence from Peru." *American Journal of Political Science* 64(2):256–274.

Albertus, Michael and Oliver Kaplan. 2013. "Land Reform as a Counterinsurgency Policy: Evidence from Colombia." *Journal of Conflict Resolution* 57(2):198–231.

Albertus, Michael, Thomas Brambor and Ricardo Ceneviva. 2018. "Land Inequality and Rural Unrest: Theory and Evidence from Brazil." *Journal of Conflict Resolution* 62(3):557–596.

Anfimov, Andrei Matveevich, ed. 1961. *Zemel'naya arenda v Rossii v nachale XX veka [Land Rent in Russia in the Beginning of the 20th Century]*. Moskva: Izdatel'srvo Akademii Nauk SSSR.

Anfimov, Andrei Matveevich, ed. 1998. *Krestianskoye dvizheniie v Rossii v 1901–1904 gg.: Sbornik dokumentov [Peasant Movement in Russia in 1901–1904: Collection of Documents]*. Moskva: "Nauka".

Angrist, Joshua D and Jörn-Steffen Pischke. 2008. *Mostly Harmless Econometrics: An Empiricist's Companion*. Princeton University Press.

Asher, Abraham. 1988. *The Revolution of 1905. Vol. 1. Russia in Disarray*. Stanford.

Aston, Trevor Henry, Trevor Henry Aston and Charles HE Philpin. 1987. *The Brenner Debate: Agrarian Class Structure and Economic Development in Pre-Industrial Europe*. Vol. 1 Cambridge University Press.

Banerjee, Abhijit and Lakshmi Iyer. 2005. "History, Institutions, and Economic Performance: The Legacy of Colonial Land Tenure Systems in India." *American Economic Review* 95(4):1190–1213.

Bates, Robert H. 1981. *Markets and States in Tropical Africa: The Political Basis of Agricultural Policies*. University of California Press.

Bazzi, Samuel and Christopher Blattman. 2014. "Economic Shocks and Conflict: Evidence from Commodity Prices." *American Economic Journal: Macroeconomics* 6(4):1–38.

Besley, Timothy and Torsten Persson. 2009. "Repression or Civil War?" *American Economic Review: Papers and Proceedings* 99(2):292–297.

Brady, Nyle C. and Ray Weil. 2002. *The Nature and Property of Soils*. Upper Saddle River, NJ: Prentice Hall.

Brenner, Robert. 1976. "Agrarian Class Structure and Economic Development in Preindustrial Europe." *Past & Present* 70(1):30–75.

Buggle, Johannes C and Steven Nafziger. 2017. "The Slow Road from Serfdom: Labor Coercion and Long-Run Development in the Former Russian Empire." *Review of Economics and Statistics* pp. 1–46.

Burds, Jeffrey. 1998. *Peasant Dreams and Market Politics: Labor Migration and the Russian Village, 1861–1905*. University of Pittsburgh Press.

Caprettini, Bruno and Hans-Joachim Voth. 2019. "Rage Against the Machines: Labour-Saving Technology and Unrest in England, 1830-32.".

Castañeda Dower, Paul and Andrei Markevich. 2017. "Democratic Support for the Bolshevik Revolution: An Empirical Investigation of 1917 Constituent Assembly Elections." *Available at SSRN 3059131* .

Castañeda Dower, Paul and Andrei Markevich. 2019. "The Stolypin Reform and Agricultural Productivity in Late imperial Russia." *European Review of Economic History* 23(3):241–267.

Chernina, Eugenia, Paul Castañeda Dower and Andrei Markevich. 2014. "Property Rights, Land Liquidity, and Internal Migration." *Journal of Development Economics* 110:191–215.

Ciccone, Antonio. 2011. "Economic Shocks and Civil Conflict: A Comment." *American Economic Journal: Applied Economics* 3(4):215–227.

Cirone, Alexandra. 2018. "Under Pressure: Political Geography of Mobilization." Working paper.

Coatsworth, John H. 1981. *Growth against Development: The Economic Impact of Railroads in Porfirian Mexico*. DeKalb, Ill.:: Northern Illinois University Press.

Darrow, David W. 2018. *Tsardom of Sufficiency, Empire of Norms: Statistics, Land Allotments, and Agrarian Reform in Russia, 1700-1921*. McGill-Queen's Press-MQUP.

Davies, James C. 1962. "Toward a Theory of Revolution." *American Sociological Review* pp. 5–19.

Dennison, Tracy. 2011. *The Institutional Framework of Russian Serfdom*. Cambridge University Press.

Dmitriev, Sergei Nikolaevich. 1918. *Ekonomicheskaya geografiya Rossii. S risunkami i statisticheskimi tablitsami o transporte, promyshlennosti i torgovle. Izdaniie 4-e*. Moscow: Tipografiia T-va I. D. Sytina.

Domenech, Jordi and Francisco Herreros. 2017. "Land Reform and Peasant Revolution. Evidence from 1930s Spain." *Explorations in Economic History* 64:82–103.

Dower, Paul Castaneda and Andrei Markevich. 2018. "Labor Misallocation and Mass Mobilization: Russian Agriculture during the Great War." *Review of Economics and Statistics* 100(2):245–259.

Dower, Paul Castañeda, Evgeny Finkel, Scott Gehlbach and Steven Nafziger. 2018. "Collective Action and Representation in Autocracies: Evidence from Russia's Great Reforms." *American Political Science Review* 112(1):125–147.

Dubrovskii, Sergei Mitrofanovich. 1956. *Krestianskoye dvizhenie v revoluitsii 1905 – 1907 gg. [Peasant Movement in the Revolution of 1905 – 1907]*. Moscow: USSR Academy of Sciences.

DuPlessis, Robert S. 1997. *Transitions to Capitalism in Early Modern Europe*. Cambridge University Press.

Edelman, Robert. 1987. *Proletarian Peasants: the Revolution of 1905 in Russia's Southwest*. Cornell University Press.

Finkel, Evgeny and Scott Gehlbach. 2020. *Reform and Rebellion in Weak States*. Elements in Political Economy Cambridge University Press.

Finkel, Evgeny, Scott Gehlbach and Dmitrii Kofanov. 2017. "(Good) Land and Freedom (for Former Serfs): Determinants of Peasant Unrest in European Russia, March–October 1917." *Slavic Review* 76(3):710–721.

Finkel, Evgeny, Scott Gehlbach and Tricia D Olsen. 2015. "Does Reform Prevent Rebellion? Evidence from Russia's Emancipation of the Serfs." *Comparative Political Studies* 48(8):984–1019.

Foran, John. 2005. *Taking Power: On the Origins of Third World Revolutions*. Cambridge University Press.

Fraley, R Chris and Simine Vazire. 2014. "The N-Pact Factor: Evaluating the Quality of Empirical Journals with Respect to Sample Size and Statistical Power." *PloS One* 9(10):e109019.

Fresh, Adriane. 2018. "Industrial Revolution and Political Change: Evidence from the British Isles." Working paper.

Geloso, Vincent and Vadim Kufenko. 2019. "Can Markets Foster Rebellion? The Case of the 1837–38 Rebellions in Lower Canada." *Journal of Economic Behavior & Organization* 166:263–287.

Gerring, John. 2017. *Case Study Research: Principles and Practices*. 2 ed. Cambridge University Press.

Gerschenkron, Alexander. 1965. "Russia: Agrarian Policies and Industrialization, 1861–1917." *The Cambridge Economic History of Europe* .

Global Multi-Resolution Terrain Elevation Data 2010 (GMTED2010): U.S. Geological Survey Open-File Report 2011–1073. N.d.
URL: *https://pubs.usgs.gov/of/2011/1073/*

Gokmen, Gunes and Dmitrii Kofanov. 2019. "Career Incentives in Political Hierarchy: Evidence from Imperial Russia." *European Review of Economic History* .

Gornyi Uchenyi Komitet. 1886, 1892, 1896, 1903, 1910. *Sbornik statisticheskikh svedenii o gornozavodskoi promyshlennosti Rossii v ... godu. [The Collection of Statistical Data on Mining Industry in Russia in ...]*. Saint-Petersburg.

Grabowski, Richard. 2002. "East Asia, Land Reform and Economic Development." *Canadian Journal of Development Studies/Revue canadienne d'études du développement* 23(1):105–126.

Gregg, Amanda G. 2020. "Factory Productivity and the Concession System of Incorporation in Late Imperial Russia, 1894–1908." *American Economic Review* 110(2):401–27.

Gregory, Paul R. 1982. *Russian National Income, 1885-1913*. Cambridge University Press.

Gregory, Paul R. 1994. *Before Command: An Economic History of Russia from Emancipation to the First Five-Year*. Princeton University Press.

Greif, Avner. 2006. *Institutions and the Path to the Modern Economy: Lessons from Medieval Trade*. Cambridge University Press.

Greif, Avner and Murat Iyigun. 2013*a*. "Social Organizations, Violence, and Modern Growth." *American Economic Review: Papers & Proceedings* 103(3):534–38.

Greif, Avner and Murat Iyigun. 2013*b*. "What Did the Old Poor Law Really Accomplish? A Redux." *A Redux (May 6, 2013)* .

Grosfeld, Irena, Seyhun Orcan Sakalli and Ekaterina Zhuravskaya. 2020. "Middleman Minorities and Ethnic Violence: Anti-Jewish Pogroms in the Russian Empire." *The Review of Economic Studies* 87(1):289–342.

Gurr, Ted Robert. 1970. *Why Men Rebel*. Princeton University Press.

Haggard, Stephan and Robert R Kaufman. 1995. *The Political Economy of Democratic Transitions*. Princeton University Press.

Hainmueller, Jens, Jonathan Mummolo and Yiqing Xu. 2019. "How Much Should We Trust Estimates from Multiplicative Interaction Models? Simple Tools to Improve Empirical Practice." *Political Analysis* 27(2):163–192.

Hellman, Joel S. 1998. "Winners Take All: The Politics of Partial Reform in Postcommunist Transitions." *World politics* 50(2):203–234.

Hobsbawm, Eric J. 1962. *Age of Revolution: 1789-1848*. New York: Mentor Book.

Hoenig, John M and Dennis M Heisey. 2001. "The Abuse of Power: The Pervasive Fallacy of Power Calculations for Data Analysis." *The American Statistician* 55(1):19–24.

Huntington, Samuel P. 1968. *Political Order in Changing Societies*. Yale University Press.

Il'yinykh, Vladimir Andreevich. 2016. "KULAKI." *Bol'shaya rossiiskaya entsiklopediya* . **URL:** *https://bigenc.ru/domestic˙history/text/2120206*

Ivanov, L. M., ed. 1964. *Krestianskoye dvizheniie v Rossii v 1861-1869 gg.: Sbornik dokumentov [Peasant Movement in Russia in 1870-1880: Collection of Documents]*. Moscow: "Mysl"'.

Jia, Ruixue. 2014. "Weather Shocks, Sweet Potatoes and Peasant Revolts in Historical China." *The Economic Journal* 124(575):92–118.

Kafengauz, Lev. 1994. *Evoliutsiia promyshlennogo proizvodstva Rossii*. Moscow: Epifaniia.

Kapoor, Mudit, Harry H Kelejian and Ingmar R Prucha. 2007. "Panel Data Models with Spatially Correlated Error Components." *Journal of Econometrics* 140(1):97–130.

Kay, Cristóbal. 2002. "Why East Asia overtook Latin America: Agrarian Reform, Industrialisation and Development." *Third World Quarterly* 23(6):1073–1102.

Kelejian, Harry H and Ingmar R Prucha. 2007. "HAC Estimation in a Spatial Framework." *Journal of Econometrics* 140(1):131–154.

Khristoforov, Igor' Anatol'yevich. 2011. *Sud'ba reformy: Russkoye krest'yanstov v pravitel'stvennoi politike do i posle otmeny krepostnogo prava (1830-1890-ye gg.)*. Sobraniie.

Kingston-Mann, Esther. 1998. *In Search of the true West: Culture, Economics, and Problems of Russian Development*. Princeton University Press.

Komitet Obshchestva vspomoshchestvovaniia nuzhdayushchimsya studentam Kievskago Politekhnicheskago Instituta Imperatora Aleksandra II. 1913. *Spravochnik po sakharnoi promyshlennosti Rossiiskoi Imperii. Kampaniia 1911 – 1912 g. God izdaniia II-i.* Kiev.

Kotsonis, Yanni. 2014. *States of Obligation: Taxes and Citizenship in the Russian Empire and Early Soviet Republic*. Toronto: University of Toronto Press.

Koval'chenko, Ivan, ed. 1979. *Massovyie istochniki po sotsial'no-ekonomicheskoi istorii Rossii perioda kapitalizma [Mass Sources of the Socio-Economic History of Russia in the Period of Capitalis]*. Moscow: Nauka.

Kursk Gub. Stat. Com. 1863. *Trudy Kurskogo gubernskogo statisticheskogo komiteta. Vypusk Pervyi [The Works of Kursk Gubernia Statistical Committee. Issue One.]*. Kursk: Tipografiia Gubernskogo pravleniia.

Kursk Gub. Statistical Bureau. 1887. *Prilozheniia. Svodnyye tablitsy po uezdam Kurskoi gubernii*. Kursk: Tipographiia gubernskogo zemstva.

Kuznetsov, Igor Anatol'evich. 2018. *Ocherki istorii sel'skokhozyaistvennoi ekonomii v Rossii*. Moscow: Izdatel'skii dom Delo.

Lacroix, Jean. 2017. "Steam Democracy Up! Industrialization-Led Opposition in Napoleonic Plebiscites." *European Review of Economic History* 22(2):135–160.
URL: *https://doi.org/10.1093/ereh/hex021*

LeGrand, Catherine. 1986. *Frontier Expansion and Peasant Protest in Colombia, 1850-1936*. University of New Mexico Press.

Lenin, Vladimir Il'yich. 1968 [1912]. *Polnoye sobraniie sochinenii. Izdaniye Pyatoye*. Vol. 21. Dekabr' 1911 – Iyul' 1912 Moscow: Izdatel'stvo politicheskoi literatury.

Lindert, Peter H and Steven Nafziger. 2014. "Russian Inequality on the Eve of Revolution." *The Journal of Economic History* 74(3):767–798.

Litvak, B. G. 1989. *Krestianskoye dvizhenie v Rossii v 1775-1904. Istoriia i metodika izucheniia istochnikov [Peasant Movement in Russia in 1775-1904. History and Methods of the Study of Sources]*. Moscow:Nauka.

Los', Fyodor Yevdokimovich, I. P. Oleinik and V. I. Sheludchenko, eds. 1955. *Revoliutsia 1905 - 1907 gg. na Ukraine. Sbornik dokumentov i materialov v 2 t.* Vol. 2 Kiev: Arkhivnoye upravleniie USSR, Tsentral'nyi gosudarstvennyi istoricheskii arkhiv USSR, Gosudarstvennoye izdatel'stvo politicheskoi literatury USSR.

Mahoney, James. 2003. "Knowledge Accumulation in Comparative Historical Research." *Comparative Historical Analysis in the Social Sciences* pp. 131–174.

Malyavskii, Alexander. 1981. *Krest'ianskoye dvizheniie v Rossii v 1917 g., mart – oktyabr'*. Moscow: Nauka.

Markevich, Andrei and Steven Nafziger. 2017. State and Market in Russian Industrialization, 1870 - 2010. In *The Spread of Modern Industry to the Periphery since 1871*, ed. Kevin H. O'Rourke and Jeffrey Gale. Oxford: Oxford University Press chapter 3, pp. 33–62.

Menne, Matthew J, Claude N Williams, Byron E Gleason, J Jared Rennie and Jay H Lawrimore. 2018. "The Global Historical Climatology Network Monthly Temperature Dataset, Version 4." *Journal of Climate* 31(24):9835–9854.

Miguel, Edward, Shanker Satyanath and Ernest Sergenti. 2004. "Economic Shocks and Civil Conflict: An Instrumental Variables Approach." *Journal of Political Economy* 112(4):725–753.

Miller, Burton Richard. 2013. *Rural Unrest During the First Russian Revolution: Kursk Province, 1905-1906*. Central European University Press.

Ministerstvo Finansov. 1896. *Fabrichno-zavodskaya promyshlennost' i torgovlya Rossii. Izdanie 2-e*. Saint-Petersburg: Tipografiia I. A. Efrona.

Ministerstvo Finansov. 1900. *Yezhegodnik ministerstva finansov. Vypusk 1899 goda.* Saint Petersburg: Tipografiia V. Kirshbauma.

Ministerstvo Finansov. 1907. *Yezhegodnik ministerstva finansov. Vypusk 1906/7 goda.* Saint Petersburg: Tipografiia V. Kirshbauma.

Ministry of Finance. Department of Trade and Manufactories. 1897. *Perechen' fabrik i zavodov. Fabrichno-zavodskaya promyshlennost' Rossii [List of the Factories and Plants of Russia. Factory Industry of Russia].* Saint-Petersburg: Tipografiyya I. A. Efrona.

Ministry of Finance. Department of Trade and Manufactories. 1903. *Spisok fabrik i zavodov Yevropeyskoi Rossii [List of the Factories and Plants of the European Russia].* Saint-Petersburg: Tipografiyya V. Kirshbauma.

Ministry of Transportation. 1914. *Statisticheskii sbornik Ministerstva putei soobshcheniia. Dlina putei soobshcheniia Rossiiskoi Imperii i obsluzhivayemye imi prostranstva k 1 yanvarya 1911 goda [Statistical Yearbook of the Minsitry of Transportation Routes. The Length of Transportation Routes of the Russian Empire and the Spaces Served by Them by the January 1, 1911].* Saint-Petersburg: Tip. M-va Putei Soobshcheniia.

Mironov, Boris. 2012. *The Standard of Living and Revolutions in Imperial Russia, 1700-1917*. Vol. 55 Routledge.

Molinder, Jakob, Kerstin Enflo and Tobias Karlsson. 2019. More Power to the People: Electricity Adoption, Technological Change and Social Conflict. Technical report CEPR Discussion Papers.

Moon, David. 1999. *The Russian Peasantry 1600-1930: the World the Peasants Made*. New York: Longman.

Moon, David. 2014. *The Abolition of Serfdom in Russia: 1762-1907*. Routledge.

Moore, Barrington. 1966. *Social Origins of Democracy and Dictatorship*. Boston: Beacon.

MZGI Department of Agriculture. 1901. *Kratkiie Spravochnyye Svedeniia o nekotorykh russkikh khozyaystvakh, Vyp. 2, Izd. 2-e*. Saint Petersburg: Tipografiia V. Kirshbauma.

Nafziger, Steven. 2010. "Peasant Communes and Factor Markets in Late Nineteenth-Century Russia." *Explorations in Economic History* 47(4):381–402.

Nafziger, Steven. 2011. "Did Ivan's Vote Matter? The Political Economy of Local Democracy in Tsarist Russia." *European Review of Economic History* 15(3):393–441.

Neal, Larry and Jeffrey G Williamson. 2014. *The Cambridge History of Capitalism, Volume 2: The Spread of Capitalism: From 1848 to the Present*. Cambridge University Press.

Nifontov, Aleksandr Sergeevich and Boris Vladimirovich Zlatoustovskii, eds. 1960. *Krestianskoye dvizheniie v Rossii v 1881–1889 gg.: Sbornik dokumentov [Peasant Movement in Russia in 1881–1889: Collection of Documents]*. Moskva: Izdatel'stvo sotsial'no-ekonomicheskoi literatury.

Okun, S. B. and K. V. Sivkov, eds. 1963. *Krestianskoye dvizheniie v Rossii v 1857 - maye 1861 gg.: Sbornik dokumentov [Peasant Movement in Russia in 1857 - may 1861: Collection of Documents]*. Moscow: Izd-vo sothsial'no-ekonomicheskoi literatury.

O'Neill, Kelly. 2016*a*. "District Post Roads of the Russian Empire (1820s).".
URL: *https://doi.org/10.7910/DVN/HECVFH*

O'Neill, Kelly. 2016*b*. "Main Post Roads of the Russian Empire (1820s).".
URL: *https://doi.org/10.7910/DVN/C5XFMK*

O'Neill, Kelly. 2016*c*. "Provincial Post Roads of the Russian Empire (1820s).".
URL: *https://doi.org/10.7910/DVN/LZ3ECA*

Orlov, Petr Aleksandrovich, ed. 1881. *Ukazatel' fabrik I zavodov Yevropeiskoi Rossii s Tsarstvom Pol'skim i Vel. Kn. Finlyandskim [Index of the Factories and Plants of the European Russia with Tsardom of Poland and Great Duchy of Finland]*. Saint-Petersburg: Tipografiyya brat'ev Panteleevykh.

Orlov, Petr Aleksandrovich, ed. 1887. *Ukazatel' fabrik I zavodov Yevropeiskoi Rossii s Tsarstvom Pol'skim i Vel. Kn. Finlyandskim. Izdaniie vtoroye [Index of the Factories and Plants of the European Russia with Tsardom of Poland and Great Duchy of Finland. 2nd Edition]*. Saint-Petersburg: Tipografiyya R. Golini.

Orlov, Petr Aleksandrovich and S. G. Budagov, eds. 1894. *Ukazatel' fabrik I zavodov Yevropeiskoi Rossii. Izdaniie tret'ye [Index of the Factories and Plants of the European Russia. 3rd Edition]*. Saint-Petersburg: Tipografiyya V. Kirshbauma.

Paige, Jeffrey M. 1978. *Agrarian Revolution*. Simon and Schuster.

Pallot, Judith. 1999. *Land Reform in Russia, 1906-1917: Peasant Responses to Stolypin's Project of Rural Transformation*. Clarendon Press.

Passarelli, Francesco and Guido Tabellini. 2017. "Emotions and Political Unrest." *Journal of Political Economy* 125(3):903–946.

Perrie, Maureen. 1972. "The Russian Peasant Movement of 1905-1907: Its Social Composition and Revolutionary Significance." *Past & Present* (57):123–155.

Piras, Gianfranco et al. 2010. "sphet: Spatial Models with Heteroskedastic Innovations in R." *Journal of Statistical Software* 35(1):1–21.

Polanyi, Karl. 1944. *The Great Transformation: Economic and Political Origins of our Time*. New York: Rinehart.

Popkin, Samuel L. 1979. *The Rational Peasant: The Political Economy of Rural Society in Vietnam*. University of California Press.

Pravitel'stvennyi Vestnik. 1902. *Pravitel'stvennyi Vestnik* (192: September 3).

Przeworski, Adam. 1991. *Democracy and the Market: Political and Economic Reforms in Eastern Europe and Latin America*. Cambridge University Press.

Redaktsionnye Komissii. 1860. *Svedeniia o pomeshich'yikh imeniiakh*. Vol. VI Saint Petersburg: Tipografiia V. Bezobrazova i komp.

Rybakov, Yurii. 1976. *Promyshlennaya statistika Rossii XIX v. Istochnikovedcheskoye issledovaniie [Industrial statistics of Russia of the XIX century. Source-study research]*. Moscow: Nauka.

Sánchez, Fabio, María del Pilar López-Uribe and Antonella Fazio. 2010. "Land Conflicts, Property Rights, and the Rise of the Export Economy in Colombia, 1850–1925." *The Journal of Economic History* 70(2):378–399.

Scott, James C. 1977. *The Moral Economy of the Peasant: Rebellion and Subsistence in Southeast Asia*. Yale University Press.

Scott, James C. 1985. *Weapons of the Weak: Everyday Forms of Peasant Resistance*. Yale University Press.

Senchakova, Larisa Timofeevna. 1989. *Krestianskoe dvizhenie v revoliutsii 1905–1907 gg. [Peasant Movement in 1905–1907 Revolution].* Moskva: Nauka.

Shanin, Teodor. 1972. *The Awkward Class. Political Sociology of Peasantry in a Developing Society Russia 1910-1925.* London: Clarendon Press/Oxford: University Press.

Shapkarin, A. V., ed. 1959. *Krestianskoye dvizheniie v Rossii v 1890 - 1900 gg. Sbornik dokumentov [Peasant Movement in Russia in 1890 - 1900. Collection of Documents]*. Moscow: Isdatel'stvo sotsial'no-ekonomicheskoi literatury.

Shapkarin, A. V., ed. 1966. *Krestianskoye dvizheniie v Rossii. Iyun 1907 g.– Iyul 1914 g.: Sbornik dokumentov [Peasant Movement in Russia. June 1907 - July 1914: Collection of Documents]*. Moscow: "Nauka".

Sliusarskii, Anton Grigor'yevich, ed. 1961. *Krest'ianskoye dvizheniie v Poltavskoi i Khar'kovskoi guberniyakh v 1902 g. [Peasant Movement in Potava and Kharkov Gubernias in 1902: Collection of Documents]*. Khar'kovskoye knizhnoye izdatel'stvo.

Statisticheskoye biuro Poltavskogo gubernskogo zemstva. 1901. *Obzor sel'skago khozyaistva v Poltavskoi gubernii za 1900 god (po soobshcheniaym korrespondentov. God pyatnadtsatyi)*. Poltava: Tipo-litografiia I. A. Dokhmana.

Statisticheskoye biuro Poltavskogo gubernskogo zemstva. 1902. *Obzor sel'skago khozyaistva v Poltavskoi gubernii za 1901 god (po soobshcheniaym korrespondentov. God shestnadtsatyi)*. Poltava: Tipo-litografiia I. A. Dokhmana.

Strumulin, Stanislav. 1966. *Ocherki ekonomicheskoi istorii Rossii i SSSR*. Moscow: Izdatel'stvo "Nauka".

Studwell, Joe. 2013. *How Asia Works: Success and Failure in the World's Most Dynamic Region*. Open Road+ Grove/Atlantic.

Suvorin, Aleksei Sergeevich, ed. 1895. *Vsya Rossiya. Russkaya kniga promyshlennosti, torgovli, sel'skogo khozyaistva i administratsii. Torgovo-promyshlennyi adres-kalendar' Rossiiskoi Imperii, Otdel II [The Whole Russia. The Russian Book of Industry, Commerce, Agriculture, and Administration. Commercial-Industrial Address-Calendar of the Russian Empire, Section II]*. Saint-Petersburg: Izd-e A. S. Suvorina.

Svavitskii, Nikolai Andreevich and Zinaida Mikhailovna Svavitskaya, eds. 1926. *Zemskiie podvornyye perepisi 1880–1913: Pouyezdnyye itogi [Zemstvo Household Censuses of 1800–1913: Uezd-Level Results]*. Moskva: TsSU SSSR.

Tawney, Richard Henry. 1912. *The Agrarian Problem in the Sixteenth Century*. Number 13 Longmans, Green.

Terner, Fedor Gustavovich. 1896. *Gosudarstvo i zemlevladeniie*. S.-Peterburg: Tipografiia M. Stasyulevicha.

Tiukavkin, Viktor Grigorievich. 2001. *Velikorusskoye krestianstvo i Stolypinskaya agrarnaya reforma*. Moskva: Pamyatniki istoricheskoi mysli.

Tocqueville, Alexis de. 1856. *The Old Regime and the Revolution, trans. John Bonner*. New York: Harper & Brothers.

Troinitskii, Aleksandr Grigorievich. 1861. *Krepostnoe naselenie v Rossii po 10-i narodnoi perepisi: statisticheskoye issledovaniie [Serf Population in Russia According to the 10th Popular Census: A Statistical Study]*. Saint-Petersburg: Tip. Karla Vul'fa.

Troinitskii, Nikolai Aleksandrovich, ed. 1904. *Pervaya vseobshchaya perepis' naseleniia Rossiiskoi Imperii, 1897 g. Vyp. XXXIII. Poltavskaya guberniya*. Saint Petersburg: Tsentral'nyi statisticheskii komitet Ministerstva vnutrennikh del. Tipografiya "T-va Khudozhestvennoi Pechati".

Troshchinskii, Dmitrii A., ed. 1887. *Pamyatnaya knizhka i adres-kalendar' Poltavskoi gubernii na 1888 god.* Poltava: Tipo-litografiia L. Frishberga.

Tsentralnyi statisticheskii komitet MVD. 1893 - 1902. *Urozhai ... goda. I. Ozimyie khleba i seno*. Saint Petersburg: Tipografiia V. Bezobrazova.

Tsentralnyi statisticheskii komitet MVD. 1907. *Statistika zemlevladeniia 1905 g. Vyp 48. Poltavskaya guberniia.* Saint Petersburg: Parovaya Tipo-Litografiia N. L. Nyrkina.

Tsentral'nyi Statisticheskii Komitet MVD. 1905-1906. *Statistika zemlevladeniia 1905 goda, vyp. I - L, ... gubernia [Statistics of Land Ownership in 1905, Issues I - L, ... province]*. Saint-Petersburg.

TsSK MVD. 1866. *Statisticheskii vremennik Rossiiskoi Imperii, Vyp. I [Statistical Chronicle of the Russian Empire, Vyp. I]*. Saint-Petersburg.

TsSK MVD. 1880. *Volosti i vazhneishiye seleniia Yevropeiskoi Rossii. Vyp. I. Gubernii Tsentral'noi zemledel'cheskoi oblasti*. Saint-Petersburg.

TsSK MVD. 1884. *Statisticheskii vremennik Rossiiskoi Imperii, Ser. III, Vyp. 4. Raspredeleniie zemel' po ugod'yam v Yevropeiskoi Rossii za 1881 god [Statistical Chronicle of the Russian Empire, Ser. III, Issue 4. Distribution of Land by Use in European Russia in 1881]*. Saint-Petersburg.

TsSK MVD. 1886. *Statisticheskii vremennik Rossiiskoi Imperii. Sbornik svedenii po Rossii za 1883 god, Ser. III, Vyp. 8 [Statistical Chronicle of the Russian Empire. The Collection of Evidence on Russia in 1883, Ser. III, Vyp. 8]*. Saint-Petersburg.

TsSK MVD. 1892. *Volosti Kurskoi gubernii*. Saint-Petersburg.

TsSK MVD. 1905, 1909. *Yezhegodnik Rossii. ... god. [The Annual Yearbook of Russia]. The ... Year*. Saint-Petersburg.

TsSK MVD. 1907. *Statistika zemlevladeniia 1905 goda. Svod dannykh po 50-ti guberniyam Yevropeiskoi Rossii*. Saint-Petersburg.

Varzar, Vasilii Egorovich, ed. 1912. *Spisok fabrik i zavodov Rossiiskoi Imperii. Sostavlen po ofitsial'nym svedeniyam Otdela Promyshlennosti Ministerstva Torgovli i Promyshlennosti [List of the Factories and Plants of the Russian Empire. Compiled on the Basis of the Official Information of the Department of Industry of the Ministry of Trade and Industry]*. Saint-Petersburg: Tipografiyya V. Kirshbauma.

Verkhovskoi, V. M. 1899. *Istoricheskii ocherk razvitiia zheleznykh dorog v Rossii s ikh osnovaniia po 1897 g. vkliuchitel'no [A Historical Review of the Development of Railroads in Russia since Their Establishment]*. Saint-Petersburg: Tip. M-va Putei Soobshcheniia.

Verzhbitskii, T. I., ed. 1892. *Pamyatnaya knizhka Kurskoi gubernii na 1892 god. Izdaniie Kurskogo gubernskogo statisticheskogo komiteta [Memory Book of Kursk Gubernia in 1892. Published by Kursk Gubernia Statistical Committee]*. Kursk: Tipografiia Gubernskogo pravleniia.

Veselovskii, Boris Borisovich, ed. 1923. *Krest'ianskiie dvizheniya 1902 goda: (Novyye materialy) [Peasant Movements of 1902: (New Materials)]*. Tsentrarkhiv. Moskva-Petrograd. Gosudarstvennoye izdatel'stvo.

Vol'noye ekonomicheskoye obshchestvo. 1908. *Agrarnoye dvizheniie v Rossii v 1905 – 1906 gg. Chast' I. Trudy Imperatorskogo Vol'nogo ekonomicheskogo obshchestva. [Agrarian Movement in Russia in 1905 – 1906. Part I. Works of the Emperor Free Economic Society]*. Saint Petersburg: Tipographiia tovarishchestava "Obshchestvennya pol'za".

Voronkova, Svetlana. 1995. *Massovyie istochniki po istorii promyshlennosti Rossii kontsa XIX – nachala XX v. [Mass Sources of the History of the Industry of Russia of the late XIX – early XX century]*. Moscow: Izdatel'stvo Moskovskogo Universiteta.

Wade, Rex A. 2017. *The Russian Revolution, 1917*. Vol. 53 Cambridge University Press.

Wcislo, Francis William. 1990. *Reforming Rural Russia: State, Local Society, and National Politics, 1855-1914*. Princeton University Press.

Witte, Sergei Yulievitch. 1922. *Vospominaniia: Tsarstvovaniie Nikolaya II. Vol. 1*. Berlin: Slovo.
URL: *http://az.lib.ru/w/witte_s_j/text_0050.shtml*

Wolf, Eric R. 1969. *Peasant Wars of the Twentieth Century*. University of Oklahoma Press.

Yaney, George L. 1982. *The Urge to Mobilize: Agrarian Reform in Russia, 1861-1930*. University of Illinois Press.

Yatsunskii, Viktor. 1973. *Sotsial'no-ekonomicheskaya istoriia Rossii XVIII – XIX vv. [Socio-Economic History of Russia in XVIII – XIX centuries]*. Moscow: Nauka.

Yezioranskii, Leon Karlovich, ed. 1909. *Fabrichno-zavodskiie predpriyatiia Rossiiskoi Imperii*. Saint Petersburg: Izdaniie Torgovogo Doma A. Sroka i Ko.

Zaionchkovskii, P. A., ed. 1968. *Krestianskoye dvizheniie v Rossii v 1870-1880 gg.: Sbornik dokumentov [Peasant Movement in Russia in 1870-1880: Collection of Documents]*. Moscow: "Nauka".

Zaionchkovskii, Petr Andreevich. 1960. *Otmena krepostnogo prava v Rossii*. Gos. uchebno-pedagog. izd-vo.

Zyryanov, Pavel Nikolayevich. 1992. *Krestianskaya obshchina Yevropeiskoy Rossii. 1907–1914 gg.* Moscow: "Nauka".