UNIVERSITY OF CALIFORNIA
Los Angeles

Essays in Political Economy and Economic History

A dissertation submitted in partial satisfaction
of the requirements for the degree
Doctor of Philosophy in Political Science

by

Evgeniya Nazrullaeva

2020

ABSTRACT OF THE DISSERTATION

Essays in Political Economy and Economic History

by

Evgeniya Nazrullaeva
Doctor of Philosophy in Political Science
University of California, Los Angeles, 2020
Professor Miriam A. Golden, Chair

In my dissertation, I study labour market institutions and their effects on political behaviour, as well as economic forces behind discriminatory policies against ethnic minorities. In the first chapter, I study electoral intimidation in Russia during the most recent 2011–12 and 2016–18 electoral cycles using a novel and rich municipality- and company-level dataset. I find a robust relationship between employment concentration, turnout, and votes for the regime in parliamentary and presidential elections. I argue that a dominant employer in a municipality can coerce its employees to turn out and vote for the regime, because voters have limited options for outside employment. I identify a causal effect of employment concentration on turnout and voting.

In the second chapter, co-authored with Imil Nurutdinov, we study the political economy of discrimination against Jewish entrepreneurs in the late Imperial Russia. Prior to 1889, a large share of Russian private capital was invested in state and state-subsidized assets that yielded a fixed return and were deemed safe. After the government received access to new external sovereign debt markets with lower interest rates, it forcefully converted bonds on the domestic market. Combined with other policy changes between 1889 and 1894, this shock freed large amounts of domestic private capital that now had to be reinvested in the equity market. We explore the relationship between anti-Jewish restrictions in the equity market that began around the same time, in 1890, and capital intensity of 3-digit manufacturing industries (SIC). Russian law required all corporate charters to be approved by the central

government, which was also used as an opportunity to target specific corporations and to preclude Jews from creating and/or investing in them. Using the RUSCORP database of all manufacturing corporations created in 1891–1902 (Owen, 1992) and novel data on the universe of Russian factories in 1890, we find a positive relationship between capital intensity and the probability of restrictions. We address some of the possible alternative explanations for the observed pattern using the data on major merchant guilds and incorporated factories.

In the third chapter, I investigate the empirical relationship between land inequality, employment concentration, the percentage of state employees and electoral results in the 1907 parliamentary election in Imperial Russia. The electoral process was two-step and classified voters into four different groups: peasants, workers, urban residents, and landowners. What were the electoral manipulation strategies of the tsarist regime back then? I argue that the regime relied on the power of landed elites, industrialists, and state employees to manipulate turnout and deliver votes in the parliamentary elections. I find that land inequality is positively associated with the turnout of peasants, which indicates the power of landowners in rural areas. Higher employment concentration, which indicates the power of industrialists, does not appear to affect the turnout of workers directly. However, higher employment concentration is negatively associated with the percentage of failed elections at factories. The share of state employees is positively associated with urban voter turnout. This could indicate electoral pressure on the state employees by the tsarist regime.

The dissertation of Evgeniya Nazrullaeva is approved.

Daniel Simon Treisman

Daniel N. Posner

Barbara Geddes

Timothy Fry

Miriam A. Golden, Committee Chair

University of California, Los Angeles

2020

To Kirill

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ACKNOWLEDGMENTS

This dissertation would not have been possible without the help and mentorship of my committee chair Miriam Golden. I am very thankful to my committee members, Timothy Frye, Barbara Geddes, Daniel Posner, and Daniel Treisman. I would not have made it this far without their advice and support. I am grateful to the Department of Economics at the University of Warwick where I spent the last three years and benefited from being a part of the economic history and political economy groups. I am grateful to Yannick Dupraz, James Fenske, Bishnu Gupta, Mark Harrison, Arianna Ornaghi, and Claudia Rei for all the feedback, advice and support.

I thank Imil Nurutdinov for the permission to include our joint work as Chapter 2. Imil Nurutdinov and Eugenia Nazrullaeva were co-PIs and contributed equally. This research was supported by a grant from the Economic History Society. This joint project with Imil has kept me going through uncertain times and sparked my interest in economic history.

I am thankful to my family and friends who always believed in me and helped me through the ups and downs of the graduate school. I am especially grateful to my mom who inspired me to pursue my dreams ever since I can remember. Finally, I thank Kirill for all the happiness, love, and support he has given to me in all these years.

VITA

2005	BA in Economics, National Research University Higher School of Economics (HSE), Moscow, Russia
2007	MA in Economics, HSE
2007	MSc in Economics, Erasmus University Rotterdam, joint with HSE
2008	MA in Economics, New Economic School (NES), Moscow, Russia
2010	Candidate of Science in Economics, HSE
2019	MA in Political Science, University of California, Los Angeles

PUBLICATIONS

"Substituting Growth for Money: Intergovernmental Transfers and Electoral Support in the Russian Federation, 2000–2008", with Israel Marques II and Andrei Yakovlev. *Economics and Politics*, 2016, 28(1), 23–54

"Regional Elites and Moscow", with Nikolay Petrov. *The New Autocracy: Information, Politics, and Policy in Putin's Russia*, ed. Daniel Treisman, Brookings Institution Press, 2018, 109–136

CHAPTER 1

Employment Concentration and Voter Turnout in Russian Elections

1.1 Introduction

Electoral intimidation thrives in middle- and high-income autocracies, and continues to exist even in some established democracies. Why? Employer pressure is the main intimidation mechanism I study in this paper. Compared to positive inducements such as vote and turnout buying, employer pressure involves different forms of negative inducements. Examples of employer pressure include pay cuts, denials of job promotion, job dismissals and in extreme cases, violence.

The attractiveness of employer pressure is that it comes at a relatively low reputational cost for the dominant party (Baland and Robinson, 2008, 2012; Mares and Young, 2016; Frye et al., 2019a,b). Employer pressure is even less observable than vote or turnout buying, because effective threats of post-electoral intimidation never result in the actual exercise of intimidation (Mares and Young, 2016). Also, pressure may be more consequential from voters' point of view, because it affects their status quo, unlike vote or turnout buying when they get benefits if they vote in a certain way, and do not get anything when they refuse the deal (Mares et al., 2019).

In this paper, I study electoral intimidation in the workplace in Russia using rich municipality- and company-level datasets and focus on the economic forces underlying the employer pressure mechanism. I argue that intimidation is more effective when employment concentration is higher. In municipalities with a single dominant enterprise or a

small group of dominant enterprises the costs of employer pressure for the regime are lower. Employers can use credible threats of intimidation to coerce their employees to turn out to vote, because in municipalities with concentrated employment outside employment options are limited.

The limits to employer pressure come from the credibility of employers' threats and ability to infer employees' voting behavior. Do employers have enough power to compromise ballot secrecy? The following example shows how such an expectation is not unreasonable.

> Date: Dec 15, 2011. Location: the city of Taganrog (Rostov Oblast, Russia).[1]:
>
> "The leadership of the metallurgical plant and TagAZ[2] forced workers to take photos of their electoral ballots and demonstrate them later as a proof they voted for United Russia, otherwise – a layoff."

This is one of many cases of employer pressure that were documented during the 2011–12 and 2016–18 electoral cycles in Russia. Based on the data from the 'Map of Violations' (NGO "Golos"[3], kartanarusheniy.org), Frye et al. (2014) estimates 83% of the reports in 2011–12 to be related to electoral intimidation at the workplace.

Russia presents a unique opportunity to test the employer pressure mechanism because 28% of Russian municipalities in 2016 had a single dominant company with the employment share over 25%.[4] Moreover, recent studies show that the current regime in Russia engages in electoral fraud, voter intimidation, and vote buying (Enikolopov et al., 2013; Simpser, 2013; Frye et al., 2014; Harvey, 2016; Rundlett and Svolik, 2016; Forrat, 2018; Frye et al., 2019a,b). After the series of protests in 2011–12 which followed the fraudulent 2011 parliamentary

[1]Source: the 2011 State Duma Election (Dec 4, 2011), retrieved from kartanarusheniy.org/2011-12-04, the crowd-sourcing project with self-reported electoral irregularities. Created by the civil rights organization "GOLOS" (http://www.golosinfo.org/), which promotes fair elections.

[2]Taganrog Automobile Plant.

[3]The civil rights association which was created back in 2000 to protect citizens' electoral rights in Russia.

[4]Based on the author's data.

election the regime's menu of manipulation in the 2012 presidential election was limited. Electoral intimidation became one of the most attractive options.

I measure turnout and the incumbent's vote share in the parliamentary 2011/16 and presidential 2012/18 elections at the municipality level[5]. In addition, I use the Bureau van Dijk's company-level data to calculate employment concentration at the municipality level in 2010–16. There are 2,350 municipalities in Russia, with about 1,099 of them formally equivalent to cities, while the rest are municipal areas and can include several smaller settlements.

Existing studies of electoral intimidation in Russia suggest that companies with immobile assets and companies in the so called monoprofile cities (monocities) are more likely to practice pressure in order to make voters turn out and vote in election times (Frye et al., 2014, 2019a,b). In 2011, 335 cities in Russia held the monocity status (313 as of 2015). Formally, a monocity is an urban settlement dominated by a single industry or a single (core) enterprise.[6] This status is assigned to a city with a single dominant company if its employment share exceeds 25%. Using a regression discontinuity design, I demonstrate that what drives employer pressure is *the company-level employment concentration in a municipality*, and not the formal status of a monocity. In this sense, employer pressure in Russian elections is similar to employer pressure practiced in other former pro-Soviet countries like Romania and Bulgaria in 2013 (Mares et al., 2019).

To estimate the causal effect of employment concentration on electoral outcomes I need a source of exogenous variation in employment concentration that is exogenous relative to the 2011–18 electoral returns. I use the company-level employment data from the 1989 USSR census (the PlanEcon database) to measure the employment concentration at the municipality level. In addition, I use propensity score matching to predict the probability of having a monocity status based on the 1989 employment concentration and the presence of natural

[5]The incumbent is defined as the dominant party United Russia in 2011/2016, and Vladimir Putin in 2012/2018.

[6]Source: The World Bank in Russia: Russian Economic Report, June 16, 2010, No 22. Last accessed on March 13, 2019.

resources.

The main results are as follows. Across all federal elections, a sizeable increase in employment concentration (if a municipality becomes monoprofile) leads to 11–15 percentage points increase in voter turnout (with the baseline of over 60 percent), all else equal. This is a substantive effect, comparable to the effect of the election-day electoral fraud reported in Enikolopov et al. (2013). I also find that concentration increases the vote share of the dominant party by up to 9 p.p. and the vote share of Vladimir Putin by roughly 11 p.p. in 2011–12. Overall, these results show that employer pressure is an effective mechanism of electoral manipulation.

This paper proceeds as follows. Section 1.2 develops the theory behind the employer pressure mechanism of mobilization and outlines hypotheses tested. Section 1.3 describes the identification strategy and the municipality-level dataset which I compiled from multiple sources. Section 1.4 presents the main results. Section 1.5 concludes.

1.2 Electoral intimidation in the workplace

1.2.1 The employer pressure mechanism

When intimidation happens, voters are deprived of what they have been entitled to, which can be a powerful stimulus for loss-averse voters. Baland and Robinson (2008, 2012) develop a formal model which shows how employer pressure can occur when ballot secrecy is violated. The main agents in their model are political parties, employers, and employees. Parties decide on the price they are ready to pay to employers in exchange for votes. Employers offer take-it-or-leave-it contracts to employees, and sell votes to a party. In this case employers act as vote brokers: they are able to produce vote swings depending on which party offers a higher price. The employment contracts are based on employees' working efforts and their expected voting behavior. Employees vote and choose their level of effort. Then production occurs and some shock to the economy is realized and observed by parties and employers. At the last stage of the game, political parties and employers distribute rents, employees get

their wage and may be fired if they voted for a 'wrong' party. For the model to work, outside employment options should be either less attractive in terms of money or geographically distant.

When is employer pressure most effective? Following Mares (2015) and Mares and Young (2016), I expect that at the sub-national level the supply of employer pressure is mainly affected by economic concentration of an electoral district. I define economic concentration in terms of employment. The mechanism behind this testable implication is that in cities with high employment concentration employees have limited exit options, as in the formal model (Baland and Robinson, 2008, 2012). This mechanism is not directly testable with the aggregate municipality-level data, so I discuss proxies for limited outside options in Section 1.3. Exerting pressure on employees in municipalities with high employment concentration is less costly for employers because they do not expect their employees to quit. Given the repeated nature of interaction between an employer and employees and the limitedness of outside options, employers can credibly threaten to apply post-electoral punishment and employees do not risk voting against the incumbent. Everything else equal, higher employment concentration should lead to an increase in turnout and an associated increase in the incumbent's vote share. The question is to what extent we can attribute electoral performance of the regime in Russia to employment concentration.

1.2.2 Russia's political regime

Russia's political regime is a promising context to test the effects of employer pressure on electoral returns. Vladimir Putin has occupied the presidential office since 2000, with a brief period in 2008–2012 when he served de jure as prime minister, but de facto he has never relinquished his power. Putin's regime solidified with the emergence of the United Russia party in 2001. There is both qualitative and emerging quantitative evidence of the incumbent regime engaging in electoral fraud, vote and turnout buying, and electoral intimidation (Enikolopov et al., 2013; Simpser, 2013; Frye et al., 2014; Rundlett and Svolik, 2016; Harvey, 2016; Forrat, 2018; Frye et al., 2019a,b). Moreover, Russia is formally a high income country,

by the World Bank definition as of 2016, and it used to be defined as an upper middle income during the most recent electoral cycle. Studying employer pressure in Russian elections adds to a growing number of studies that show that electoral intimidation can be encountered at different levels of economic development. Finally, as Simpser (2013) mentions, these days Russia has enough geopolitical importance to make its elections worth studying.

Russia holds two types of federal level elections: presidential elections (every four years since 1996 and before 2012, now every six years) and legislative elections for the lower house of the parliament, the State Duma (every four years since 1995, and every five years since 2011). The president is chosen by a majority run-off. However, the only election with two rounds happened back in 1996 when Boris Yeltsin was re-elected. As for legislative elections, up to 2007 legislators were elected by the mixed-member electoral system, with both the proportional representation (PR) and the single-member district components (SMD). In 2007 this practice was changed, and the electoral system became fully proportional, but not for long. The 2016 election was based on the mixed-member system again. This decision at the time was viewed as one of the regime's concessions to political elites after the series of protests in 2011–12.

The persistence of electoral manipulation in Russia may seem surprising given the regime's heavy investments into Putin's popular support. In the media, Putin's name was closely associated with the party, although he was not formally its member. United Russia was able to enjoy popular support driven by Putin's personal popularity. The danger of this close association became apparent in 2011, when United Russia was labeled as the party of 'crooks and thieves' by Russian opposition leader Alexey Navalny.[7] The fear of losing the supermajority in the State Duma led to an extensive electoral fraud in the 2011 election.

A common explanation behind electoral manipulation is that the regime needs to win with "supermajorities" to signal its strength to political elites and masses (Magaloni, 2006; Simpser, 2013). Maintaining supermajorities in parliament was also crucial for the Russian regime to have the power to amend the constitution. A major amendment since the adoption

[7]The English term was introduced by Julia Ioffe in the 'Putin's Big Mistake" article on December 6, 2011. http://www.newyorker.com/news/news-desk/putins-big-mistake. Last Accessed: April 2, 2016.

of the constitution back in 1993 was lengthening a presidential term from four to six years in 2008. This amendment was passed by both houses of the parliament and regional legislatures in less than 50 days.[8] Rundlett and Svolik (2016) also suggests that local agents contributed to the oversupply of electoral fraud in the 2011 election. Enikolopov et al. (2013) estimated that the amount of fraud, based on ballot manipulation alone, was sufficient to ensure United Russia's electoral victory in 2011.

A series of large scale anti-government protests immediately followed the parliamentary election on December 4, 2011. Allegations of electoral fraud existed in previous electoral cycles, but an increasing role of social media (mainly, Facebook and Twitter) and civil rights organizations (specifically, "GOLOS"), which were politicized by the regime's opponents, led to more scrutiny from the masses (Robertson, 2017; Reuter and Szakonyi, 2015). This tied the regime's hands with respect to the amount of electoral fraud it could engage in in subsequent elections.

Direct measures of electoral fraud are unavailable in most contexts, but for the case of Russia's 2011–18 elections there exist self-reported data on the cases of electoral malpractice (the 'Map of Violations', kartanarusheniy.org). This is a crowdsourced project created by the NGO "GOLOS". A complaint of electoral malpractice can be filed online anonymously. Figure 1.1 suggests that more complaints of electoral irregularities were reported in the 2011–12 electoral cycle (up to 8,000 in 2011) compared to the 2016–18 cycle (up to 4,000).

1.2.3 Existing studies of voter intimidation in the workplace

The two existing studies by Frye et al. (2014) and Frye et al. (2019a) of a more general phenomenon – electoral intimidation – in Russia show that it works through the workplace locus. Frye et al. (2014) and Frye et al. (2019a) use surveys to test whether electoral intimidation is present in Russia. In the 2011–2012 electoral cycle 7.5% of respondents in their survey (designed as a list experiment) indicated that they expected negative consequences as a

[8]"Russia's Medvedev Signs Constitutional Amendment to Lengthen Presidential Terms" by Philip P. Pan, Dec 31, 2008. http://www.washingtonpost.com/wp-dyn/content/article/2008/12/30/AR2008123000839.html. Last Accessed: April 3, 2016.

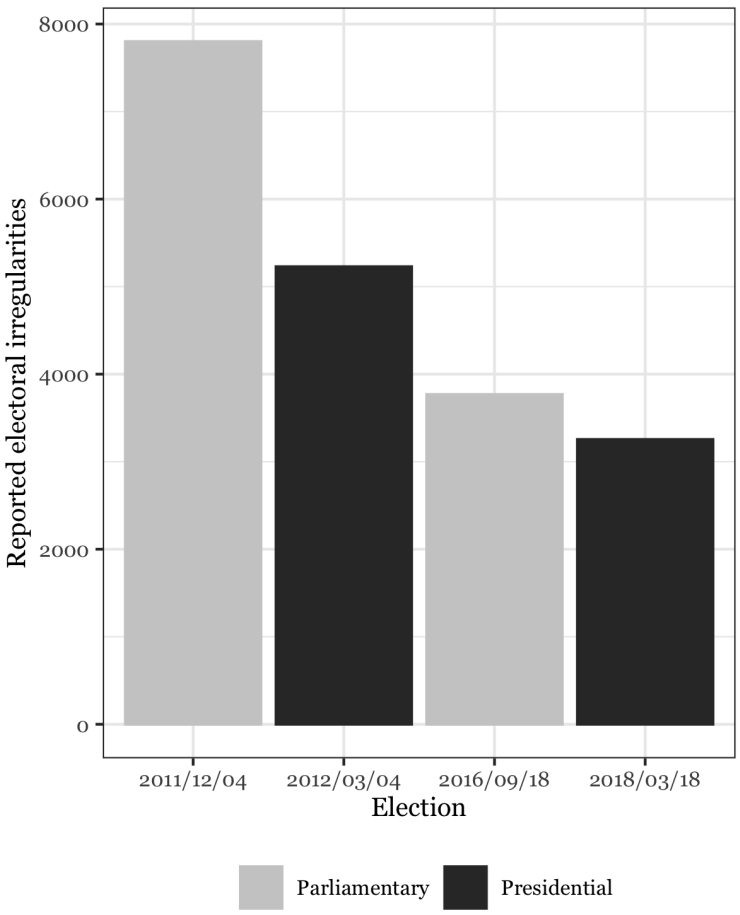


Figure 1.1: The number of self-reported electoral irregularities during the 2011–12 and 2016–18 electoral cycles. Source: Map of Violations, kartanarusheniy.org.

result of their voting behavior, and only 0.5% of respondents indicated that they encountered vote buying. Both of these studies have a potential issue in the form of an omitted observed confounder, which is employment concentration. Frye et al. (2019a) results are suggestive of employment concentration being at work, since in their survey data almost half of employees in Russian monocities reported electoral intimidation. Frye et al. (2019b) uses a survey experiment to demonstrate that voters are most responsive to electoral intimidation by employers compared to other types of voter brokers such as party officials.

To fully test how the employer pressure mechanism works through employment concentration one can conduct a survey experiment, with a specific design to elicit answers regarding sensitive issues related to electoral intimidation (Mares and Young, 2016; Mares et al., 2019;

Frye et al., 2019a,b). Mares et al. (2019) conducts a series of list experiments in pairs of localities in Bulgaria and Romania, which are similar in terms of their observable characteristics but different in terms employment concentration. They show that in localities with diversified economy there was no significant employer pressure effect, while in economically concentrated localities up to 20% of voters experienced some forms of political pressure and workplace pressure. The list experiments on employer pressure which were conducted in the Russian context are so far descriptive in their nature, and economic (or employment) concentration was not directly embedded into the design.

Employer pressure is also prevalent among the state employees (Mares (2015), Frye et al. (2014), Forrat (2018), Weitz-Shapiro (2012), Larreguy et al. (2017)). Forrat (2018) argues that governors at the regional level use school teachers as effective vote brokers for the regime during election times. The motivation to act as vote brokers may be coercion: qualitative evidence suggests that teachers can be forced by school principals to engage in mobilization and electoral manipulation (Forrat (2018), pp. 421–22). Therefore, electoral intimidation in the workplace can be observed both in private and public sectors, and apart from the direct effect on the votes of employees can have indirect network effects when these employees can mobilize other voters to provide even more votes to the regime. Forrat (2018) uses observational data on 79 Russia's regions to study the effect of electoral manipulation by teachers in the 2012 presidential elections and finds positive correlation between teacher density in 2011 and electoral support for Putin.

Harvey (2016) studies the menu of electoral manipulation available to the regime in Russia, and uses absentee voting — when voters cast their ballots not at the polling stations they are assigned to but at the polling stations at work — as a proxy for electoral intimidation in the workplace. Using the polling station data in the 2011 parliamentary election, Harvey (2016) shows that there is a positive association between United Russia's vote buying and voter intimidation efforts and United Russia's vote margin at the regional level, i.e. when the opposition closely monitors elections and can contest the results United Russia prefers not to engage in blatant electoral fraud and uses other more costly means of electoral manipulation instead.

This paper contributes to the existing literature on electoral intimidation in the workplace and the studies of electoral manipulation in Russia. I offer an empirical strategy based on observational data at the municipality level that allows me to estimate a causal effect of employment concentration on electoral outcomes in Russia during the 2011–18 electoral cycles.

In terms of empirical strategy, this paper is most closely related to the studies of elections in Prussia prior to 1914 by Mares (2015). Unlike Mares (2015), I study the actual electoral outcomes and not registered electoral complaints, to avoid selective reporting. Mares (2015) uses linear interpolation to estimate the effect of the change in employment concentration between 1895 and 1905, which is a very strong assumption given the scarce historical data. In addition, the empirical identification strategy in Mares (2015) does not address the problem of endogeneity between electoral complaints and concentration.

1.2.4 Alternative mechanisms and unobserved confounders

There can be other mechanisms that produce the same high levels of support for the incumbent in the municipalities with high levels of employment concentration. I address observable implications of several alternative mechanisms in my empirical identification strategy.

First, the incumbent can use *vote or turnout buying* rather than employer pressure. Both mechanisms ensure higher turnout in elections and the incumbent's electoral victory, but they operate through different channels. Vote/turnout may include a municipality or a dominant company receiving a grant from the incumbent before the election. Mares (2015) mentions that employers can distribute material (wage-related) and non-material benefits to their employees (vacation days, bonuses, etc.) as means of vote buying. Cities (municipalities) with a formal *monoprofile status* were entitled to financial support after the 2008–2009 economic crisis. In the empirical estimation strategy, I control for whether there is a monoprofile city in a given municipality. In addition, one can measure the regime's support of dominant employers through *public procurement contracts* awarded to companies in a municipality. I collected the data on public procurement contracts from Rosstat for a limited number of

years and municipalities, 2010–12. The data on public procurement is aggregated at the municipality level, and I control for the cost of public procurement contracts per capita.[9]

Second, the theory of retrospective economic voting predicts that in the municipalities with better economic situation the popular support for the incumbent should be higher (Fiorina, 1978; Ferejohn, 1986; Barro, 1973). Treisman (2011) shows that the president's popularity in Russia (at the aggregate national level) is largely driven by the public's economic perceptions, which are correlated with economic outcomes. Rosenfeld (2018) further suggests that the incumbent's popularity is related to economic performance at the sub-national level, and that individual voters in Russia are able to evaluate their region's performance despite information asymmetry and the existing media bias in favour of the incumbent regime. To take into account the mechanism of economic voting, I collected the data from Rosstat on total volume of taxable income per capita at the municipality level. There is no indicator equivalent to the gross regional product available at the municipality level. In addition, I control for the presence of natural resource deposits in a municipality. I expect that electoral support for the regime may be higher in municipalities that are rich in natural resources.

Forrat (2018) argues that governors at the regional level use schoolteachers as brokers for the regime during election times (similar to the argument introduced in Larreguy et al. (2017)). Forrat (2018) suggests that teachers deliver votes mostly through electoral fraud. In the 2012 election, Putin enjoyed higher support in regions with higher teacher density (the number of teachers per capita). As a proxy for the mechanism of electoral intimidation by state employees, I constructed an indicator of the public sector employment in 2010–16 based on the company-level data, and included it as a control variable in the regression analysis.

Finally, there is a concern that political elites might be able to produce higher electoral outcomes for the regime. Localities where mayors are co-partisans of the incumbent enjoy higher financial support delivering more votes to the incumbent in exchange (Bracco et al., 2013). In the Russian context by the 2016–18 electoral cycle most local elites were members of the ruling party (Reuter, 2010; Buckley et al., 2014). Since 2005, mayoral elections were can-

[9]I intend to identify public procurement contracts awarded to dominant employers in a municipality in the future iterations of this work.

celled in half of Russian municipalities. Buckley et al. (2014) finds minor differences in elected versus appointed mayors' background, based on their observable individual characteristics.

1.3 Data and empirical identification strategy

1.3.1 Causal identification: instrumental variables approach

To identify the causal effect of employment concentration on electoral returns I use a source of exogenous variation in the current levels of employment concentration (in the 2000s). My identification is based on Russian cities' historical legacy. About half of all contemporary Russian cities were founded during the Soviet era. New cities and municipal areas were created as territorial industrial complexes, which were characterized by a high degree of regional specialization and spatial isolation (Nefedova and Treivish, 2003). I use the company-level data from the last Soviet census of 1989 (the PlanEcon database) to construct a measure of employment concentration at the municipality level that I use as an instrument. I trace changes in the names of settlements from 1989, and aggregate the 1989 company-level data to the municipality level in the 2000s.

The causal mechanism behind the instrumental variable strategy is the following (see Figure 1.2): an instrument should directly affect a municipality's current employment concentration but not electoral outcomes (Wooldridge, 2010).

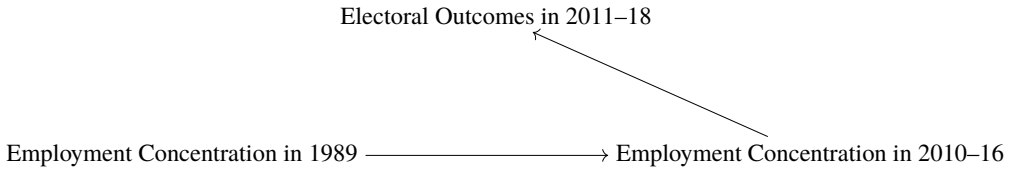


Figure 1.2: The instrumental variable strategy: employment concentration

First, an instrument should be relevant, i.e., correlated with employment concentration.[10] This condition can be tested directly (see Section 1.4). The company-level employment

[10]The violation of this condition is known as the weak instrument problem (Staiger and Stock, 1997; Stock and Yogo, 2005).

concentration observed back in 1989 is strongly correlated with the current levels of employment concentration. Second, the instrument should be valid, i.e. the exclusion restriction should not be violated (Figure 1.2). Employment concentration in 1989 should affect electoral outcomes through the current levels of employment concentration (after 2010) but not directly. One plausible channel of how the exclusion restriction might be violated for employment concentration in 1989 to have an effect of electoral returns in 2011–18 is through lower wages in municipalities with high employment concentration. The data on average wages at the municipality level is not available for the period of interest, therefore, I collected the data on taxable income per capita in 2010–17 from Rosstat.

1.3.2 Employment concentration

In this subsection I define the measures of employment concentration which are the main variables of interest. Since my argument is that employer pressure should be higher in municipalities with a single dominant employer or with a small group of large companies I measure employment concentration directly from the company-level data.

The data source for the company-level data in 2010–18 (around 800,000 registered entities total) is the Bureau van Dijk database "Orbis"[11]. The Bureau van Dijk cooperates with the Federal State Statistics Service (gks.ru) and the Federal Tax Service, and provides data on companies' registration and their financial statements, which include employment data. The main problem with company location data in Russia is that most companies are de jure registered in Moscow and Saint-Petersburg, but de facto operate in other cities. The main advantage of "Orbis" is that it provides de facto postal codes where known. I match de facto postal codes to the postal codes from the Russian Post Service database to infer municipalities where companies are located (vinfo.russianpost.ru). I used de facto company locations, and whenever de facto locations were missing I replaced them with de jure postal codes. As of 2011, most of the companies in the dataset come from the manufacturing sector

[11]Russian, Ukrainian, and Kazakh financial company information. Access was provided by the Rosenfeld Library at the UCLA Anderson School of Management in 2018, https://www.anderson.ucla.edu/rosenfeld-library/databases/business-databases-by-name/orbis

(which includes nonferrous metallurgy), with the second largest sector being mining. In almost 30% of all cities the dominant employer (with the maximum employment share) is from the mining or nonferrous metallurgy sectors.

Using company-level data, I calculate total employment in 2010–16 at the municipality level, and each company's employment share within a municipality.[12] I then use the company with the *maximum employment share* in each municipality as a proxy for the dominant employer. I also measure employment concentration using a more standard approach, by calculating the *Herfindahl-Hirschman Index* (HHI) for employment. The index is defined in the following way:

$$\text{HHI}_i = \sum_{j=1}^{J_i} \text{s}_{ij}^2, \tag{1.1}$$

where $\text{s}_{ij} \in [0, 1]$ is the share of people employed at the company j in municipality the i, and J_i is the total number of companies in the municipality i. The HH index ranges from $\frac{1}{J_i}$ to 1, where the value of 1 represents the monopoly power of the company, and the value of $\frac{1}{J_i}$ represents perfect competition.

In a similar way I construct the dominant employer's share and the Herfindahl-Hirschman Index of employment concentration at the municipality level from the 1989 Soviet company-level data (the PlanEcon database). I track changes in settlement names from 1989 to the 2000s, to ensure that the units of analysis are comparable.

Figure 1.3 shows employment concentration levels in the 2000s and in 1989. The median employment concentration (HHI) was 0.12 in 1989 and 0.06 in 2016. Measures of employment concentration, the dominant employer's share and the Herfindahl-Hirschman index of employment, are available for roughly 2,000 municipalities both in 2010–16 and 1989. Dominant employers in Russian cities mostly come from the private sector. Based on the available data that I collected, the share of state owned enterprises being dominant employers in 2010–16 was roughly 7%.

[12] 2016 was the last financial year provided in the Orbis database as of April 2018 when the dataset was collected.

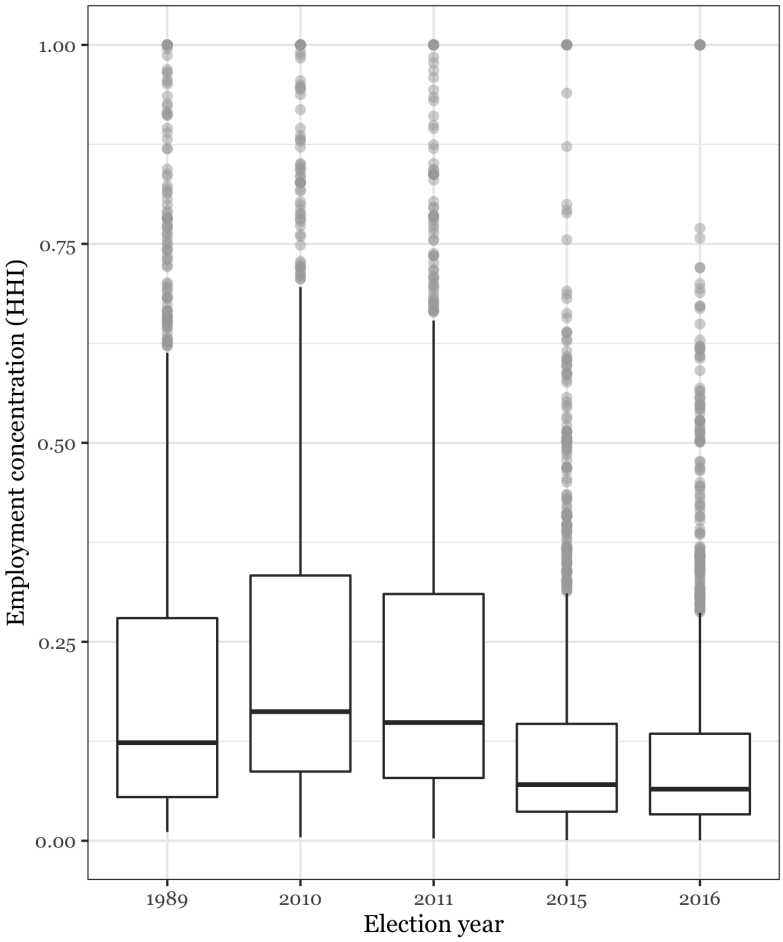


Figure 1.3: Employment concentration 1989 vs 2010–16. Source: the data from Orbis Bureau van Dijk and PlanEcon, author's calculations.

1.3.3 Electoral returns in 2011–18

The electoral data at the level of polling stations are available at the official website of the Central Electoral Commission (www.cikrf.ru). I used the federal-level electoral data for the 2011/16 parliamentary elections and the 2012/18 presidential elections from the stat.golos.org database created by Sergey Shpilkin from the official CEC data[13].

The electoral data are given at the level of electoral precincts, formally called *territorial electoral commissions* in Russia. In the 2011–12 and 2016–18 electoral cycles there existed over 2,500 electoral districts, comprised of over 90,000 polling stations. Electoral districts are

[13]See stat.golos.org.

formed on a permanent basis, but there are adjustments across election years. I recoded the data on electoral districts to the municipality level data. In most cases municipalities have a one-to-one correspondence to an electoral district. There are up to 500 *urban territorial electoral commissions* formally equivalent to largest cities in 2011–18, while the rest are municipal areas and can include several smaller settlements.

From the 2011 and 2016 electoral data at the municipality level I measure turnout (relative to the number of registered voters) and United Russia's vote share. The number of people who voted in the election is calculated as the sum of the number of valid and invalid ballots. The number of registered voters is available in the data. United Russia's vote share is calculated as the ratio of the ballots submitted for the party to the number of people who voted. Similarly, from the 2012 and 2018 electoral data I measure turnout and the vote share for the winning candidate Vladimir Putin. Figure 1.4 shows the distribution of electoral outcomes at the municipality level, and suggests that the median turnout is consistently higher in presidential than parliamentary elections. The 2016 parliamentary election was an outlier election with the median turnout below 50 per cent, in some municipalities turnout was as low as 25 per cent.

United Russia's vote margin in 2011/16 is calculated as the difference between United Russia's vote share and the vote share of the runner-up party. I construct Putin's vote margin in the 2012/18 elections in a similar way. The vote margin variables allow me to take into account that employer pressure may be applied to make employees turn out and vote for Putin or the United Russia, or instead to make employees who support the opposition party abstain or not vote for it. From Figure 1.4, vote margin is never negative in the 2000s in the presidential elections, that is Putin never lost elections at the municipality level, unlike United Russia that lost elections in some municipalities in 2011 and 2016.

In addition, for each election I calculate the ratio of absentee ballots to the number of registered voters in a given municipality. Qualitative evidence suggests that employers pressure their employees to take absentee ballots 60 days prior to an election and vote in their workplace, where turnout can be observed, instead of the polling stations where employees are assigned to vote (Frye et al. (2014) and 'Map of Violations'). Figure 1.4 shows that the

ratio of absentee ballots to the votes for the regime has a lot of outliers: in some cases the ratio is as high as 40 per cent, and the outliers are especially prominent in parliamentary elections. However, absentee ballots were abolished by the law passed in 2017, right before the 2018 presidential election. Currently, if a voter wants to vote at a polling station different to where she was assigned to, she needs to submit a formal petition 45 days prior. Therefore, there is no opportunity to identify voters who switched polling stations in the most recent elections.

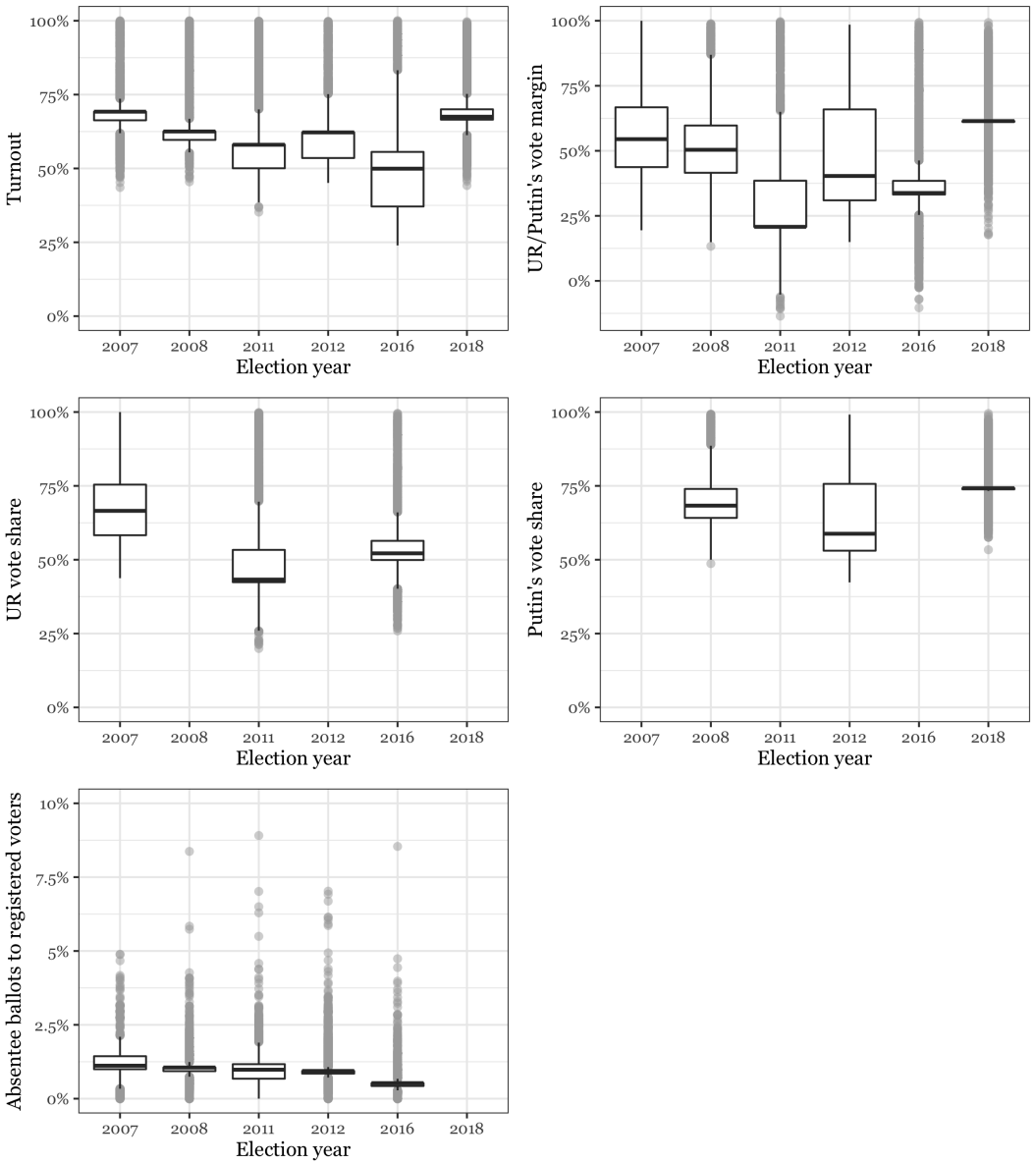


Figure 1.4: The distribution of electoral outcomes in the 2011/16 parliamentary and 2012/18 presidential elections. Source: author's calculations.

1.4 Empirical results

1.4.1 Model specification

The main parametric equation of interest is the following:

$$y_{ij} = \alpha + \beta \text{HHI}_{ij} + x'_{ij}\delta + \gamma_j + \varepsilon_{ij}, \tag{1.2}$$

where i indexes municipalities, j indexes regions, y_{ij} is the electoral return variable (turnout, a vote share), HHI_{ij} is a measure of employment concentration (the HH index of employment concentration), x_{ij} is the vector of controls, and γ_j is the set of region fixed effects. I cluster standard errors at the municipality level.

The observable implication of voter intimidation in the workplace is that higher employment concentration HHI_{ij} in the municipality j allows the dominant employer to pressure employees to turn out and vote in a certain way, therefore, the estimated coefficient β should be positive. The identification strategy I use to estimate the causal effect of employment concentration is based on the instrumental variable approach described in Section 1.3. I use the 1989 employment concentration as the instrument for the employment concentration levels in 2010–16.

x_{ij} includes several control variables. First, I control for the urban status of municipalities to avoid the effects being confounded by large cities. Voters in large cities can be more politically engaged, especially after the wave of 2011 protests. Vladimir Putin enjoyed popular support at times of economic growth (Treisman (2011)). Therefore, I include taxable income per capita in x_{ij} to take into account that voting decisions on election day can be based on economic considerations. Moreover, municipalities rich in natural resources have additional incentives to vote based on economic considerations. The source of the data on natural resources is the 2007 U.S. Geological Survey (USGS) dataset on Russia (minerals.usgs.gov). There were 345 mineral resource deposits in Russia as of 2007.At the same time, in municipalities with richer and more educated people one could expect lower support for the regime that engages in fraud and coercion to stay in power.

Public sector employment can be an alternative channel of electoral intimidation — teachers and doctors can act as vote brokers to the regime, as well as employers (Forrat (2018)). I measure public sector employment at the municipality level in 2010–16 from the Bureau van Dijk company-level data as the percentage of public sector employees relative to the total employment.

1.4.2 Results and discussion

1.4.2.1 Employment concentration

I first measure employment concentration as Herfindahl-Hirschman index. In Table 1.2 and Table 1.3 in Appendix 1.B, I present the estimation results for Equation (1.2) with different types of the outcome variable. I study the effect of employment concentration separately for the regime's electoral returns in the 2011/16 parliamentary elections and in the 2012/18 presidential elections. The regime's electoral returns in 2011/2016 are measured via turnout, United Russia/Putin's vote share, and United Russia/Putin's vote margin. If the employer pressure mechanism dominates in the data, I should see positive and significant coefficients for the HH index of employment concentration in the 2011–12 and 2016–18 electoral cycles, i.e., across model specifications in Table 1.2 and Table 1.3. For the sake of simplicity, the main results of interest for the effects of employment concentration are summarized in Figure 1.5 across Models 1.2.1–1.2.6 for the parliamentary elections and Models 1.3.1–1.3.6 for the presidential elections.

The instrumental variables strategy I use to identify causal effects of employment concentration suggests that the 1989 measures of employment concentration appear to be relevant instruments for the current levels of concentration (the first-stage F statistic is over 10 in all model specifications in Table 1.2 and Table 1.3). The exclusion restriction might be violated if employment concentration can influence electoral outcomes not through the current levels of employment concentration, but through other channels, e.g. lower wages as a consequence of monopsony in the labor market. I do not have the data on wages paid by dominant employers at the municipality level, however, in all regression specifications I control for taxable income

per capita (logged).[14]

In addition, I use an alternative measure of employment concentration, the employment share of the dominant employer in the municipality (Table 1.4 for parliamentary elections and Table 1.5 for presidential elections in Appendix 1.B). I expect to see a similar positive pattern, that is higher electoral returns in municipalities with a higher employment share of the dominant employer(s). The main results are summarized in Figure 1.5.

The results summarized in Figure 1.5 suggest that higher employment concentration leads to higher turnout both in parliamentary (2011 and 2016) and presidential elections (2012 and 2018). At the same time, in municipalities with higher employment concentration the vote shares of United Russia and Putin are also higher. These results are consistent with the empirical implication of employer pressure in the workplace: higher turnout produced by dominant employers should produce more votes for the regime. The results hold if I consider vote margin for United Russia and Putin as an outcome variable: in municipalities with higher employment concentration United Russia and Putin are more likely to win the election with a higher vote margin. Substantively, if a given municipality becomes monoprofile, that is, the HHI of employment concentration increases from its minimum value of 0.004 to its maximum value of 1, turnout rates in the 2011–12 electoral cycle would increase by roughly 11–15 p.p., all else equal. A similar increase in employment concentration would produce an increase in the UR vote share of 9 p.p. and an increase in Putin's vote share of 11 p.p. Enikolopov et al. (2013) estimates the size of electoral fraud on the election day in Moscow in 2011 was around 11 p.p. The pre-election day intimidation in the workplace can produce sizable vote swings, especially if we consider the baseline turnout and vote shares. The average turnout in 2011 (2012) was 65 (69) percent, and the average United Russia's (Putin's) vote share was 54 (68) percent. The effect sizes are higher in 2016–18 (around 20 p.p.). When I take into account standard deviations in employment concentration and in the electoral outcome variables, the standardized effect of employment concentration on turnout in 2011 is roughly similar to the

[14]Since there are missing values for taxable income per capita, the initial sample size decreases. In addition, I omit Moscow and Saint-Petersburg, as well as Crimea, the Chechen and Ingush Republics, from the estimation.

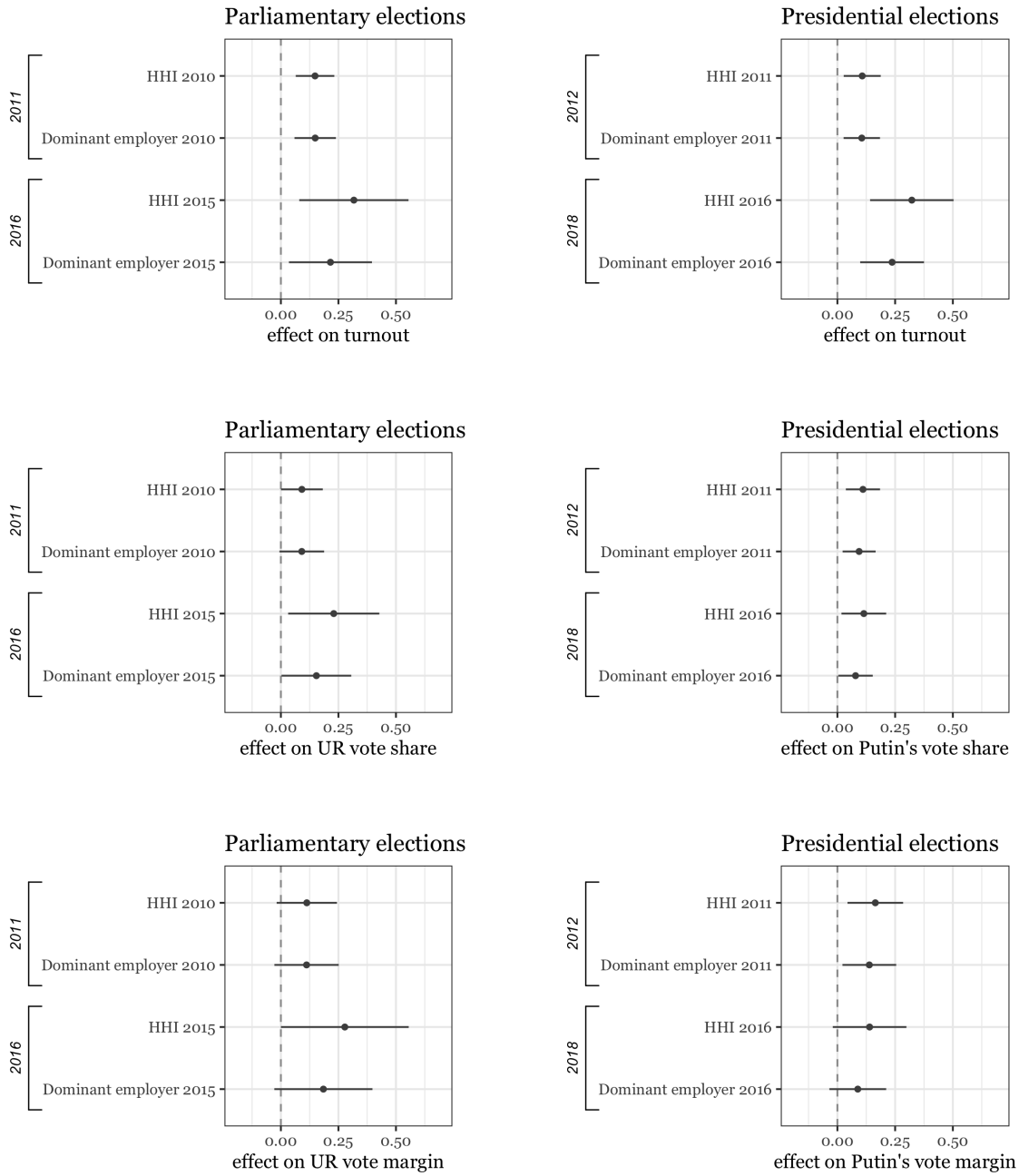


Figure 1.5: Summary of the main estimation results (with 95% confidence intervals). Source: Table 1.2–Table 1.3 and Table 1.4–Table 1.5 in Appendix 1.B.

effect on turnout in 2016. However, the standardized effect on the UR vote share is twice as large in 2016 compared to 2011. For the presidential elections, the standardized effect of concentration on turnout is twice as high in 2018 compared to 2012, while the standardized

effect on Putin's vote share is roughly the same in 2018 compared to 2012.

1.4.2.2 Robustness checks

There is a high degree of inertia in the electoral returns data at the aggregate level, so as a robustness check I include the electoral outcome during the previous electoral cycle as a control variable. I do not control for the lagged outcomes in the main regression specification, as the electoral returns in the previous electoral cycle can absorb the effects of other control variables that do not change over time. The biggest concern is that slowly changing employment concentration can be captured in the lagged outcome variable. At the same time, taking into account the lagged outcome allows me to mitigate some concerns of unobserved confounding variables, since I cannot include municipality-level fixed effects. A similar concern arises if I consider the municipality-level electoral data over the two consecutive electoral cycles in a two-period longitudinal dataset: slowly changing employment concentration can be collinear with municipality-level fixed effects. Table 1.6 and Table 1.7 show how the estimation results change if I include lagged election outcomes as additional controls. When the lagged election outcome in the previous cycle is included as a control variable (at $t-1$), the estimated coefficients for employment concentration show whether concentration can explain the change in turnout and vote shares in the current cycle (at t). The effects of employment concentration in presidential elections appear to be more robust, especially the effect on turnout in 2012, while similar effects in parliamentary elections are not statistically significant.

As a proxy for vote/turnout buying, I collected the data on the total value of public procurement contracts distributed within a municipality in a given year. The data is provided by Rosstat (gks.ru) at the municipality level in 2010–12, and does not cover all municipalities. I expect that municipalities with a higher volume of public procurement contracts demonstrate better electoral returns for the regime, i.e. higher turnout and higher vote shares for Putin and United Russia. In order to distinguish between employer pressure and vote/turnout buying, I include the proxy for the total cost of public procurement contracts per capita awarded to a municipality in the 2011–12 electoral cycle in Table 1.8 and Table 1.9, as the data for

the 2016–18 is not available from Rosstat. Although the sample size decreases, the main relationship between employment concentration and electoral returns remains unaffected in all specifications. There is indirect evidence in my data of vote/turnout buying at the municipality level: a higher volume of public procurement contracts per capita leads to higher turnout and vote shares for the regime in 2011–12 and 2016-18 electoral cycles. Compared to the effect of employment concentration (in terms of standardized coefficients), the effect of public procurement is smaller. In the 2011 parliamentary election, the standardized effects of public procurement on turnout and vote share for United Russia were around 0.7 of the standardized effects of employment concentration. In the 2012 presidential election, the effects of public procurement are around 1.5 of the effects of employment concentration. In 2016–18, substantive comparison of the effects is not very meaningful since I control for public procurement lagged by one electoral cycle due to the lack of more recent municipality-level data (as of 2019).

To check whether the main effects are driven by employees pressured to vote where they work instead of where they live, I construct the ratio of absentee votes to the total number of registered voters. I normalize the number of absentee votes by dividing by the number of registered voters as I want to control for the size of the municipality. If the practice to pressure voters to take absentee ballots so that they vote in the workplace is widespread, I expect to see a positive relationship between employment concentration and the ratio of absentee ballots. As it was mentioned previously, the data on absentee ballots is only available in 2011, 2012, and 2016. Since 2018, the use of absentee ballots was abolished. Table 1.10 presents the estimation results with the ratio of the absentee ballots as the outcome variable for the 2011 and 2016 parliamentary elections, and for the 2012 presidential elections. However, there seem to be no statistically significant relationship between the absentee votes and employment concentration. The results are similar if I construct the ratio of absentee votes to the total number of votes.

1.4.3 Is there a monocity effect?

Does the monocity status matter for employer pressure, or is there a general effect of employment concentration? Not all municipalities with high employment concentration have a formal monocity status. Moreover, if there is a small monocity in the otherwise economically heterogeneous municipality, then the outside employment options of the employees at the dominant firm in the monocity are not constrained. As of October 2019, the Ministry of Economy and the State Duma consider to pass the law to reduce the number official monocities from 321 to around 170.[15]

The caveat in testing the effect of a city's monocity status on electoral outcomes is that the status is not randomly assigned. To test the monocity effect on electoral outcomes I again need to find a source of exogenous variation.

According to the official rule which existed during the 2011–12 and 2016–18 electoral cycles (defined by the Ministry of Economy), the monocity must have a single enterprise with over 25% of employment. This formal rule allows me to use a regression discontinuity design. By studying a smaller sample of municipalities close to the 25% threshold (within the 5 per cent deviation) I can exploit the formal rule. The municipalities just above the threshold should be formally defined as monocities. The municipalities just below the threshold should not have this status. The regression discontinuity allows to estimate the local effect of the monocity status on turnout and the incumbent vote share. The maximum employment share of a single company is now the so-called running variable in the regression discontinuity analysis.

I define the local treatment in the regression discontinuity design as:

$$\mathrm{T}_i = I\left(\text{Normalized Maximum Employment Share}_i \geq 0\right), \tag{1.3}$$

$$\text{Normalized Maximum Employment Share}_i = \text{Maximum Employment Share}_i - 0.25. \tag{1.4}$$

[15]Source: https://www.rbc.ru/economics/29/10/2019/5db7981f9a7947a38ddd3537. Last accessed on Nov 13, 2019.

where i is a city around the 25% discontinuity. Maximum Employment Share$_i$ is the underlying running variable, 0.25 (25%) is the threshold. Normalized Max Employment Share$_i$ is the normalized running variable (as in Equation (1.4)). It is a common way to ensure that discontinuity is at zero. The local treatment T_i is equal to 1 for municipalities with a normalized maximum employment share above zero.

Figure 1.6 shows the graphs with discontinuities for the outcome variables of interest. I add a linear regression fit (with the interaction between T_i and the normalized running variable), along with the 95% confidence interval. If there is any significant local effect of a monocity status around the threshold, one should observe a 'discontinuity' at 25% (the vertical line at 0). According to Frye et al. (2019a), employer pressure is higher in monocities, so the intersection with the vertical line (at 0) of the regression fit below the threshold should be below the intersection with the vertical line of the regression fit above the threshold.

Figure 1.6 shows that the formal rule, although being predictive of the monocity status, does not perfectly assign cities to the monocity group (above discontinuity). At the same time, there are observations above discontinuity which are not monocities. There is a clear discretion in assigning the monocity status. The results from the regression discontinuity approach allow me to argue that the monocity status does not affect electoral returns in Russia on its own, it is employment concentration in cities that matters. There are no signs of the expected discontinuity at 25%, on the contrary, it is even more likely that turnout and votes in formally monoprofile municipalities are lower than in non-monoprofile ones.

1.5 Conclusion

In this paper I argued that electoral intimidation in the workplace is less costly when employment is concentrated in a single company or a group of large companies since employees have limited outside options. I study the electoral intimidation mechanism in the Russian context during the most recent 2011–18 electoral cycle. Existing studies convincingly argue that the current regime in Russia has an extensive manipulation menu, but this paper is the first one to test the causal effect of employment concentration on Russian regime's electoral

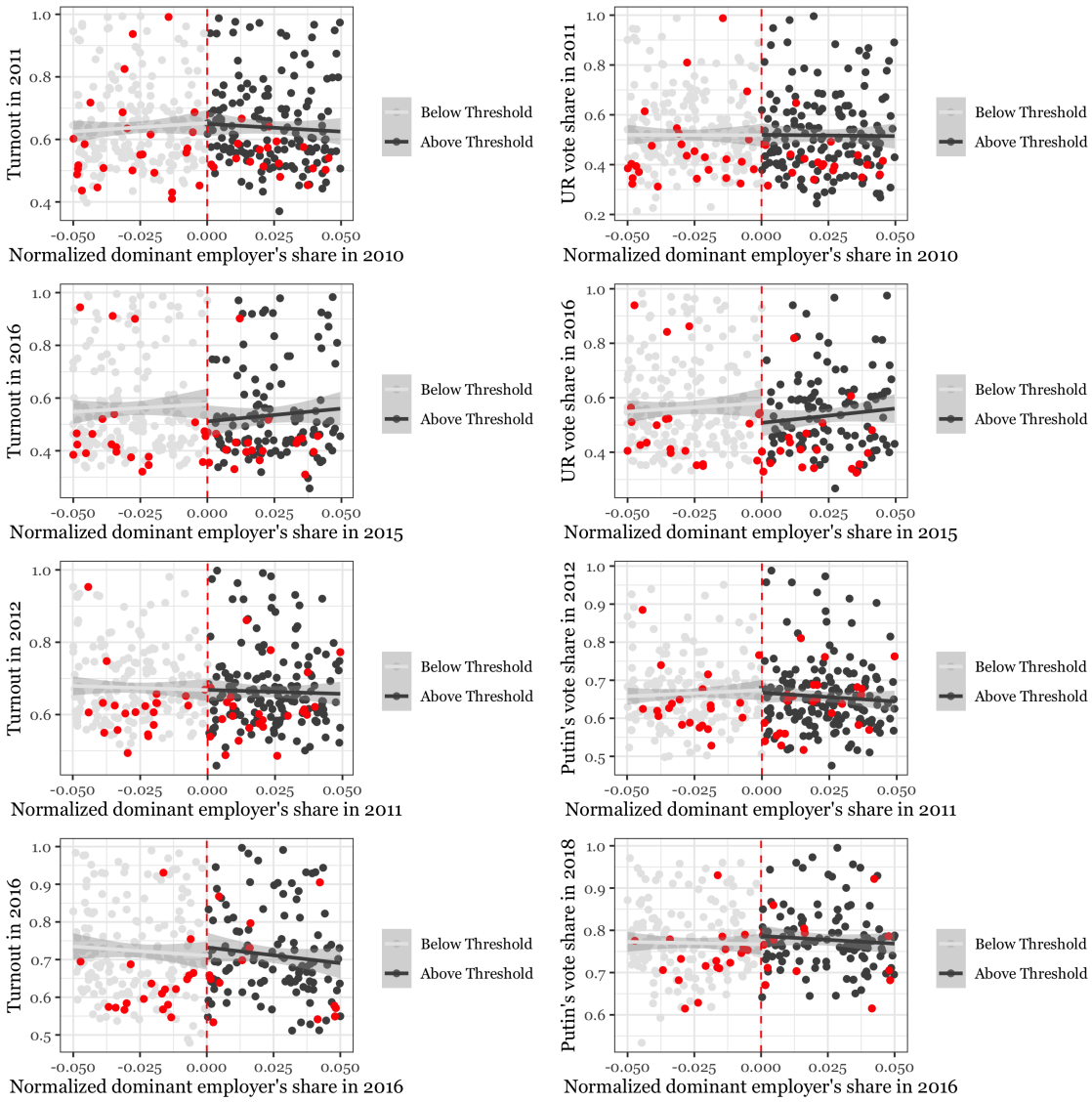


Figure 1.6: Dominant employer's share vs electoral returns: parliamentary (2011 and 2016) and presidential (2012 and 2018) elections

returns. To identify the causal effect of employment concentration I use the instrumental variables approach, based on the source of exogenous variation in employment concentration tied to cities' formation back in the Soviet era. I show that turnout and vote shares of United Russia and Vladimir Putin were substantively higher in municipalities with higher employment concentration.

1.A Appendix: Data sources

Data on firm-level employment: (i) the Bureau van Dijk database "Orbis" on Russian, Ukrainian, and Kazakh financial company information. Access was provided by the Rosenfeld Library at the UCLA Anderson School of Management in 2018, https://www.anderson.ucla.edu/rosenfeld-library/databases/business-databases-by-name/orbis; (ii) the 1989 USSR census (the PlanEcon database) kindly shared by Tatiana Mikhailova.

Electoral data on parliamentary and presidential elections in 2007/2008, 2011/2012, 2016, 2018: the stat.golos.org database created by Sergey Shpilkin from the official Central Electoral Commission data (the data is available at the polling station level).

Presence of natural resources (as of 2007): U.S. Geological Survey (USGS) dataset on Russia, minerals.usgs.gov.

Baza dannykh munitsipal'nykh obrazovaniy po sub'ektam Rossiyskoy Federatsii [Rosstat's database of the municipality-level indicators], gks.ru

Ob'ev social'nykh vyplat i nalogooblagaemykh denezhnykh dokhodov naseleniya v srednem na 1 zhitelya munitsipal'nogo rayona. [Rosstat's volume of social benefits and taxable income (personal income and the income of individual entrepreneurs.] Source: gks.ru.

Universitetskaya informatsionnaya sistema Rossiya: Bazy dannukh i analiticheskie publikatsii. Munitsipalitety. [UIS Russia database (MSU), the database on municipalities]. Naselenie: otsenka chislennosti naseleniya na 1 yanvarya tekuschego goda [Population as of Jan 1 in a current year], 2010–14. Source: uisrussia.msu.ru.

1.B Appendix: Descriptive statistics and empirical results

Table 1.1: Summary statistics

Statistic	N	Mean	St. Dev.	Min	Max
Turnout 2007	1,980	0.709	0.128	0.436	1.000
Turnout 2008	2,018	0.753	0.122	0.455	1.000
Turnout 2011	1,990	0.648	0.144	0.352	0.999
Turnout 2012	2,021	0.685	0.117	0.451	0.998
Turnout 2016	2,022	0.562	0.188	0.239	1.000
Turnout 2018	2,022	0.717	0.118	0.442	0.997
UR vote share 2007	1,980	0.696	0.112	0.438	1.000
UR vote share 2011	1,990	0.537	0.174	0.199	0.998
UR vote share 2016	2,022	0.558	0.161	0.259	0.995
Putin's vote share 2008	2,018	0.715	0.106	0.487	0.993
Putin's vote share 2012	2,021	0.676	0.109	0.423	0.991
Putin's vote share 2018	2,022	0.772	0.076	0.534	0.995
HHI 1989	1,902	0.215	0.238	0.011	1.000
HHI 2010	1,918	0.248	0.234	0.004	1.000
HHI 2011	1,917	0.234	0.229	0.003	1.000
HHI 2015	1,949	0.126	0.157	0.001	1.000
HHI 2016	1,949	0.119	0.158	0.001	1.000
Dominant employer's share 1989	1,902	0.320	0.244	0.035	1.000
Dominant employer's share 2010	1,918	0.358	0.240	0.018	1.000
Dominant employer's share 2011	1,917	0.344	0.238	0.015	1.000
Dominant employer's share 2015	1,949	0.227	0.182	0.012	1.000
Dominant employer's share 2016	1,949	0.215	0.181	0.010	1.000
Government employment 2010	1,918	0.069	0.144	0.000	1.000
Government employment 2011	1,917	0.067	0.139	0.000	1.000
Government employment 2015	1,949	0.058	0.108	0.000	1.000
Government employment 2016	1,949	0.059	0.108	0.000	1.000
Monocity in a municipality	2,022	0.111	0.315	0.000	1.000
Presence of natural resources	2,022	0.065	0.246	0.000	1.000
Public procurement 1,000 Rub p.c. 2010	1,234	3,127.482	18,272.780	0.015	540,743.900
Public procurement 1,000 Rub p.c. 2011	1,279	3,111.041	10,633.380	0.070	212,324.300
Public procurement 1,000 Rub p.c. 2012	1,231	3,260.547	9,648.610	0.006	201,117.400
Taxable income 1,000 Rub p.c. 2010	1,173	82.047	185.608	2.579	2,221.588
Taxable income 1,000 Rub p.c. 2011	1,085	89.159	176.809	3.327	2,302.292
Taxable income 1,000 Rub p.c. 2015	1,171	134.110	243.702	3.992	2,498.972
Taxable income 1,000 Rub p.c. 2017	1,171	130.373	224.068	4.131	3,134.415
Urban status (TIK)	2,022	0.092	0.290	0.000	1.000

Table 1.2: Election results and employment concentration: Parliamentary elections in 2011 and 2016

	2011	2016	2011	2016	2011	2016
	Turnout		UR vote share		UR vote margin	
	(1)	(2)	(3)	(4)	(5)	(6)
HHI 2010	0.148***		0.091*		0.113	
	(0.050)		(0.050)		(0.071)	
HHI 2015		0.317**		0.230*		0.278
		(0.148)		(0.121)		(0.171)
Monocity	−0.016*	−0.041***	−0.006	−0.030***	−0.003	−0.041***
	(0.009)	(0.010)	(0.009)	(0.008)	(0.013)	(0.011)
Natural resources	−0.009	−0.030***	−0.019	−0.027**	−0.023	−0.033*
	(0.011)	(0.011)	(0.014)	(0.011)	(0.017)	(0.017)
Government employment 2010	0.015		0.007		0.017	
	(0.024)		(0.021)		(0.029)	
Government employment 2015		−0.052		−0.058		−0.076
		(0.063)		(0.047)		(0.063)
City status (urban)	−0.041**	−0.102***	−0.117***	−0.062**	−0.171***	−0.067
	(0.018)	(0.032)	(0.024)	(0.031)	(0.033)	(0.043)
Taxable income p.c. 2010, log	−0.011**		−0.020***		−0.023***	
	(0.004)		(0.005)		(0.006)	
Taxable income p.c. 2015, log		−0.009*		−0.008*		−0.012**
		(0.005)		(0.004)		(0.006)
Region FE	✓	✓	✓	✓	✓	✓
First-stage F	25.497	19.47	25.497	19.47	25.497	19.47
N	1,122	1,127	1,122	1,127	1,122	1,127
R^2	0.698	0.735	0.741	0.729	0.713	0.730

Notes:

***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.
Standard errors, clustered by municipality, in parentheses.

Table 1.3: Election results and employment concentration: Presidential elections in 2012 and 2018

	2012	2018	2012	2018	2012	2018
	Turnout		Putin's vote share		Putin' vote margin	
	(1)	(2)	(3)	(4)	(5)	(6)
HHI 2011	0.107**		0.111**		0.164**	
	(0.050)		(0.044)		(0.070)	
HHI 2016		0.322***		0.114*		0.139
		(0.114)		(0.066)		(0.109)
Monocity	−0.023***	−0.026***	−0.006	−0.008**	−0.008	−0.009
	(0.007)	(0.007)	(0.007)	(0.004)	(0.010)	(0.006)
Natural resources	−0.011	−0.008	−0.007	0.001	−0.003	0.001
	(0.011)	(0.010)	(0.008)	(0.006)	(0.013)	(0.011)
Government employment 2011	0.008		−0.013		−0.022	
	(0.022)		(0.016)		(0.025)	
Government employment 2016		−0.029		−0.022		−0.028
		(0.050)		(0.024)		(0.034)
City status (urban)	−0.036*	−0.032*	−0.058***	−0.023***	−0.082***	−0.038***
	(0.021)	(0.016)	(0.014)	(0.007)	(0.023)	(0.012)
Taxable income p.c. 2011, log	−0.002		−0.010***		−0.008	
	(0.005)		(0.004)		(0.006)	
Taxable income p.c. 2017, log		0.004		−0.002		−0.002
		(0.004)		(0.002)		(0.004)
Region FE	✓	✓	✓	✓	✓	✓
First-stage F	41.275	19.765	41.275	19.765	41.275	19.765
N	1,030	1,127	1,030	1,127	1,030	1,127
Adjusted R^2	0.687	0.596	0.677	0.660	0.643	0.645

Notes:

***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.
Standard errors, clustered by municipality, in parentheses.

Table 1.4: Election results and dominant employer: Parliamentary elections in 2011 and 2016

	2011	2016	2011	2016	2011	2016
	Turnout		UR vote share		UR vote margin	
	(1)	(2)	(3)	(4)	(5)	(6)
Dominant employer's share 2010	0.149***		0.091*		0.112	
	(0.050)		(0.053)		(0.075)	
Dominant employer's share 2015		0.215**		0.154*		0.185
		(0.108)		(0.091)		(0.129)
Monocity	−0.021**	−0.046***	−0.009	−0.033***	−0.007	−0.045***
	(0.009)	(0.010)	(0.009)	(0.008)	(0.013)	(0.011)
Natural resources	−0.011	−0.031***	−0.020	−0.028**	−0.024	−0.034**
	(0.011)	(0.011)	(0.013)	(0.011)	(0.017)	(0.017)
Government employment 2010	0.016		0.007		0.017	
	(0.024)		(0.021)		(0.028)	
Government employment 2015		−0.032		−0.043		−0.058
		(0.048)		(0.037)		(0.050)
City status (urban)	−0.044**	−0.104***	−0.119***	−0.063**	−0.173***	−0.069
	(0.019)	(0.032)	(0.024)	(0.031)	(0.033)	(0.044)
Taxable income p.c. 2010, log	−0.011**		−0.020***		−0.023***	
	(0.004)		(0.005)		(0.007)	
Taxable income p.c. 2015, log		−0.010**		−0.009**		−0.013**
		(0.005)		(0.004)		(0.006)
Region FE	✓	✓	✓	✓	✓	✓
First-stage F	25.497	19.47	25.497	19.47	25.497	19.47
N	1,122	1,127	1,122	1,127	1,122	1,127
R^2	0.695	0.746	0.740	0.737	0.713	0.736

Notes:

***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.
Standard errors, clustered by municipality, in parentheses.

Table 1.5: Election results and dominant employer: Presidential elections in 2012 and 2018

	2012	2018	2012	2018	2012	2018
	Turnout		Putin's vote share		Putin' vote margin	
	(1)	(2)	(3)	(4)	(5)	(6)
Dominant employer's share 2011	0.106**		0.094**		0.138**	
	(0.047)		(0.041)		(0.065)	
Dominant employer's share 2016		0.237***		0.079		0.088
		(0.087)		(0.048)		(0.080)
Monocity	−0.026***	−0.031***	−0.008	−0.010**	−0.011	−0.012*
	(0.007)	(0.008)	(0.007)	(0.004)	(0.010)	(0.007)
Natural resources	−0.012	−0.008	−0.008	0.001	−0.005	0.0003
	(0.011)	(0.011)	(0.008)	(0.006)	(0.013)	(0.011)
Government employment 2011	0.009		−0.012		−0.020	
	(0.022)		(0.015)		(0.024)	
Government employment 2016		−0.017		−0.016		−0.020
		(0.038)		(0.019)		(0.027)
City status (urban)	−0.039*	−0.037**	−0.060***	−0.025***	−0.086***	−0.041***
	(0.021)	(0.016)	(0.014)	(0.007)	(0.023)	(0.012)
Taxable income p.c. 2011, log	−0.002		−0.010***		−0.010*	
	(0.005)		(0.004)		(0.006)	
Taxable income p.c. 2017, log		0.003		−0.002		−0.003
		(0.004)		(0.002)		(0.004)
Region FE	✓	✓	✓	✓	✓	✓
First-stage F	41.275	19.765	41.275	19.765	41.275	19.765
N	1,030	1,127	1,030	1,127	1,030	1,127
Adjusted R^2	0.682	0.612	0.683	0.671	0.649	0.653

Notes:

***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.
Standard errors, clustered by municipality, in parentheses.

Table 1.6: Election results and employment concentration: Parliamentary elections in 2011 and 2016, robustness checks. Lagged dependent variable as a control

	2011	2016	2011	2016
	Turnout		UR vote share	
	(1)	(2)	(3)	(4)
HHI 2010	−0.010		−0.022	
	(0.039)		(0.047)	
HHI 2015		0.147		0.005
		(0.216)		(0.154)
Monocity	−0.005	−0.030***	−0.005	−0.027***
	(0.009)	(0.010)	(0.010)	(0.009)
Natural resources	−0.012	−0.030*	−0.024**	−0.047***
	(0.012)	(0.017)	(0.010)	(0.014)
Government employment 2010	−0.033**		−0.066***	
	(0.015)		(0.021)	
Government employment 2015		0.020		0.028
		(0.063)		(0.044)
City status (urban)	−0.003	−0.025	−0.005	−0.016
	(0.014)	(0.028)	(0.026)	(0.024)
Turnout 2007	0.821***			
	(0.025)			
Turnout 2011		1.002***		
		(0.034)		
UR votes 2007			1.167***	
			(0.036)	
UR votes 2011				0.682***
				(0.029)
Taxable income p.c. 2010, log	−0.017***		−0.025***	
	(0.004)		(0.005)	
Taxable income p.c. 2015, log		0.017		0.015**
		(0.012)		(0.007)
First-stage F	10.937	18.388	10.937	18.388
N	1,120	1,125	1,120	1,125
R^2	0.641	0.585	0.628	0.571

Notes:
***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.
Standard errors, clustered by municipality, in parentheses.

Table 1.7: Election results and employment concentration: Presidential elections in 2012 and 2018, robustness checks. Lagged dependent variable as a control

	2012	2018	2012	2018
	Turnout		Putin's vote share	
	(1)	(2)	(3)	(4)
HHI 2011	0.092**		0.105**	
	(0.041)		(0.042)	
HHI 2016		0.032		−0.100
		(0.110)		(0.080)
Monocity	0.006	−0.025***	−0.003	−0.012**
	(0.008)	(0.008)	(0.008)	(0.005)
Natural resources	0.004	−0.018	−0.004	−0.023*
	(0.011)	(0.011)	(0.010)	(0.013)
Government employment 2011	−0.009		0.003	
	(0.015)		(0.025)	
Government employment 2016		0.049		−0.009
		(0.039)		(0.049)
City status (urban)	0.019	−0.030***	−0.033**	−0.006
	(0.015)	(0.012)	(0.014)	(0.009)
Turnout 2008	0.717***			
	(0.023)			
Turnout 2012		0.802***		
		(0.023)		
Putin's vote share 2008			0.679***	
			(0.026)	
Putin's vote share 2012				0.458***
				(0.026)
Taxable income p.c. 2011, log	0.007*		−0.005	
	(0.004)		(0.004)	
Taxable income p.c. 2017, log		0.001		0.002
		(0.004)		(0.003)
First-stage F	62.745	72.496	62.745	72.496
N	1,030	1,127	1,030	1,127
Adjusted R^2	0.593	0.563	0.533	0.372

Notes:
***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.
Standard errors, clustered by municipality, in parentheses.

Table 1.8: Election results and employment concentration: Parliamentary elections in 2011–2016 and public procurement contracts p.c. (log) as a control

	2011	2016	2011	2016
	Turnout		UR vote share	
	(1)	(2)	(3)	(4)
HHI 2010	0.163***		0.096*	
	(0.054)		(0.054)	
HHI 2015		0.361**		0.224
		(0.165)		(0.141)
Monocity	−0.017*	−0.041***	−0.012	−0.032***
	(0.010)	(0.012)	(0.010)	(0.010)
Natural resources	0.009	−0.018	−0.003	−0.022*
	(0.012)	(0.012)	(0.014)	(0.013)
Government employment 2010	0.002		−0.004	
	(0.025)		(0.023)	
Government employment 2015		−0.073		−0.062
		(0.073)		(0.053)
City status (urban)	−0.063***	−0.056*	−0.128***	−0.082*
	(0.020)	(0.033)	(0.039)	(0.047)
Public procurement p.c. 2010, log	0.007*		0.005	
	(0.004)		(0.004)	
Public procurement p.c. 2012, log		0.002		−0.003
		(0.005)		(0.004)
Taxable income p.c. 2010, log	−0.014**		−0.018***	
	(0.006)		(0.006)	
Taxable income p.c. 2015, log		−0.009		−0.007
		(0.006)		(0.005)
Region FE	✓	✓	✓	✓
First-stage F	21.278	13.436	21.278	13.436
N	902	850	902	850
R^2	0.733	0.773	0.744	0.747

Notes: ***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.
Standard errors, clustered by municipality, in parentheses.

Table 1.9: Election results and employment concentration: Presidential elections in 2012–2018 and public procurement contracts p.c. (log) as a control

	2012	2018	2012	2018
	Turnout		Putin's vote share	
	(1)	(2)	(3)	(4)
HHI 2011	0.127**		0.122**	
	(0.050)		(0.048)	
HHI 2016		0.363***		0.129*
		(0.138)		(0.076)
Monocity	−0.022***	−0.029***	−0.006	−0.010**
	(0.007)	(0.009)	(0.007)	(0.005)
Natural resources	−0.009	−0.005	−0.009	0.005
	(0.011)	(0.010)	(0.010)	(0.007)
Government employment 2011	0.003		−0.011	
	(0.024)		(0.018)	
Government employment 2016		−0.065		−0.028
		(0.061)		(0.030)
City status (urban)	−0.021	−0.061***	−0.059***	−0.032**
	(0.018)	(0.018)	(0.021)	(0.013)
Public procurement p.c. 2011, log	0.013***		0.012***	
	(0.004)		(0.003)	
Public procurement p.c. 2012, log		0.001		−0.0004
		(0.005)		(0.002)
Taxable income p.c. 2011, log	−0.007		−0.012**	
	(0.006)		(0.005)	
Taxable income p.c. 2017, log		0.005		−0.001
		(0.005)		(0.003)
Region FE	✓	✓	✓	✓
First-stage F	35.629	14.528	35.629	14.528
N	819	845	819	845
Adjusted R^2	0.745	0.587	0.691	0.646

Notes: ***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.
Standard errors, clustered by municipality, in parentheses.

Table 1.10: Election results and employment concentration: The ratio of absentee votes to registered voters in the parliamentary and presidential elections

	2011		2012		2016	
	(1)	(2)	(3)	(4)	(5)	(6)
HHI 2010	0.002					
	(0.003)					
HHI 2011			−0.002			
			(0.003)			
HHI 2015					0.008	
					(0.006)	
Dominant employer's share 2010		0.001				
		(0.003)				
Dominant employer's share 2011				−0.002		
				(0.003)		
Dominant employer's share 2015						0.005
						(0.005)
Monocity	0.00005	−0.00001	−0.0005	−0.0004	−0.0004	−0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.0004)	(0.0004)
Natural resources	−0.001	−0.001	0.002	0.002	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Government employment 2010	0.002	0.002				
	(0.002)	(0.002)				
Government employment 2011			−0.001	−0.001		
			(0.001)	(0.001)		
Government employment 2015					−0.005***	−0.004***
					(0.002)	(0.001)
City status (urban)	0.002	0.002	0.0005	0.0005	0.0003	0.0002
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)
Taxable income p.c. 2010, log	0.0001	0.0001				
	(0.0004)	(0.0004)				
Taxable income p.c. 2011, log			0.001***	0.001***		
			(0.0004)	(0.0004)		
Taxable income p.c. 2015, log					0.001***	0.001***
					(0.0003)	(0.0003)
Region FE	✓	✓	✓	✓	✓	✓
First-stage F	25.497	26.565	41.275	43.895	19.47	19.819
N	1,122	1,122	1,030	1,030	1,127	1,127
Adjusted R^2	0.349	0.349	0.342	0.339	0.301	0.323

Notes:

***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.
Standard errors, clustered by municipality, in parentheses.

CHAPTER 2

Discrimination, Market Entry Barriers, and Corporations in Imperial Russia

2.1 Introduction

In his seminal study, Gerschenkron (1962) argued that the lack of large-scale private capital was one of the main causes of Russia's underdevelopment before World War I. Recent scholarship has suggested that to the extent that such capital was available, it was under-utilized, because firms failed to adopt a corporate form of organization (Gregg, 2019). In this paper, we examine the political factors that likely contributed to this failure by focusing on how a specific group of economic agents, Jewish entrepreneurs, were restricted in their ability to create and invest in corporations due to discrimination.

In the Russian Empire, general incorporation law did not exist. Instead, every single corporate charter had to be reviewed and approved by local authorities and the central government on the case-by-case basis. At the end of this process, the charter was signed by the tsar. Further changes to charters also required the government's approval. If incorporation was so time-consuming and difficult, why did firms incorporate at all? Gregg (2019) emphasizes several benefits as the primary motives of incorporation in the Russian context. First, owners of corporations, unlike other enterprise forms, enjoyed full limited liability. Second, the corporate form made it easier to raise long-term capital, provided access to foreign and domestic stock and bond markets, and allowed to lock in capital to make capital investments.

Starting from 1890, some newly issued and updated charters contained discriminatory clauses that banned Jewish entrepreneurs from buying shares of such corporations and/or

purchasing property (see Figure 2.6 in Appendix 2.A for an example). What explains the timing of discriminatory restrictions against Jewish entrepreneurs? The rise in anti-Semitism alone fails to explain the variation in the number of discriminatory restrictions across different industries. Also, the government's decision to restrict incorporation for any particular group of agents is not theoretically obvious, assuming that it was concerned with maximizing tax revenue and capital invested in strategic sectors.[1] We argue that some producers sought to limit entry of new firms on the market by limiting the potential entrants' access to equity capital. To that end, they appealed to nationalist rhetoric and lobbied the government to impose restrictions on creation and investment in corporations by Jews.

What determined which industries were more likely to be affected by anti-Jewish discrimination? Shortly before the first discriminatory charter was issued, the inflow of capital unintentionally created competitive pressure among firms in capital-intensive industries. Prior to 1889, a large share of Russian private capital was invested in state and state-subsidized assets that yielded a fixed return and were deemed safe. In the 1880s, the government received access to new external sovereign debt markets with more favorable interest rates than on the domestic market. To decrease its outstanding obligations, the government forcefully converted bonds on the domestic market between 1889 and 1894, offering lower interest rates to investors in government securities than before. During the same period, the government forcefully repurchased shares of railroad companies, the rate of return on which was guaranteed and was comparable to government securities. These two policy changes freed large amounts of domestic private capital that now had to be reinvested in the private sector (the equity market in particular). Figure 2.1 summarizes this argument.

We exploit the variation in industries' pre-shock capital intensity to study the relationship between industry structure and discrimination. We use the RUSCORP database of all corporations whose charters were approved (Owen, 1992) and focus on the period between 1891–1902,[2] for which we have information on anti-Jewish restrictions at the corporation level

[1]Such as production of steel and heavy machinery, which are important for military purposes. This logic would work under the assumption that elites do not fear replacement, or if there are significant external threats (Acemoglu and Robinson, 2006).

[2]The first three corporate charters with anti-Jewish clauses were issued in 1890. We drop the 1890 cross

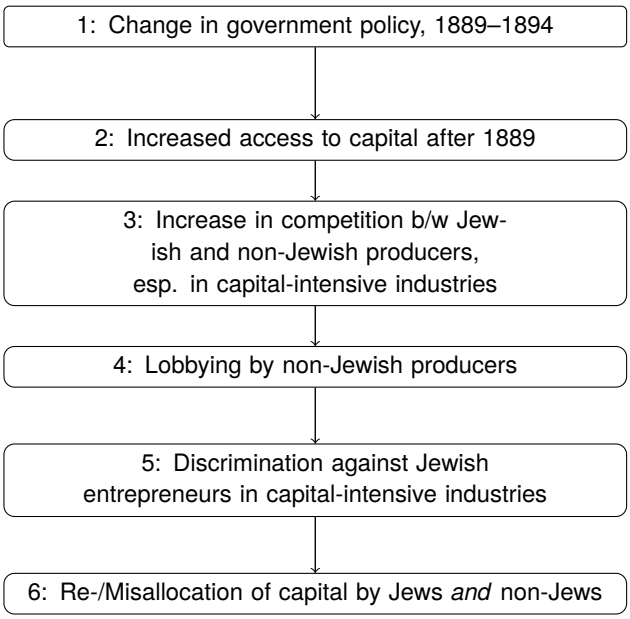


Figure 2.1: Steps of the theoretical argument

(from Levin, 1902). To construct a measure of capital intensity, we assemble a novel dataset on all factories in the Russian Empire in 1890. We manually classify every factory by 3-digit SIC (Standard Industrial Classification) industries. After that, we define an industry's capital intensity as the total machine power, the closest proxy for capital we can obtain, divided by the total number of workers. To cross-validate this measure, we construct an analogous measure of capital intensity for the U.S. using the 1890 Census of Manufacturers (although not all industries can be matched across the two datasets). Using a probit model with year fixed effects, we show that restrictions against Jewish entrepreneurs were more likely to be imposed in more capital-intensive industries.

We address two potential concerns related to our research design. A first is that the RUSCORP database does not include charters of would-be corporations that were not approved, which can lead to selection bias. Also, entrepreneurs might have been disincentivized from investing effort in creating a corporation due to the risk of rejection or red tape. To create a pool of counterfactual entrepreneurs, we utilize the fact that anyone seeking to

section from analysis because of the lack of variation in the dependent variable, and also because our main explanatory variables are measured in 1890.

establish a firm of a certain size, be it in a corporate or other legal form, had to first register with a merchant guild by purchasing a certificate in every city where it would have business activity. We collect information on all guild members registered in St. Petersburg, Moscow, and Odessa, the three major cities of industry and commerce, as of 1890. This dataset includes more than 11,000 individuals who had the legal right to establish a corporation in the respective city (although they did not necessarily use this right). Then, we match this sample with the data on those who actually established corporations between 1853 and 1913 (from the RUSCORP). Using the information on ethnicity and national origin of guild members and founders of corporations, we ask whether guild members from Jewish background were differentially less likely to create a corporation in any industry after 1890 in a differences-in-differences setting. If that were the case, our results from the pooled regression would rather be indicative of a more general discrimination trend than discrimination in a particular set of industries. However, we do not find evidence of Jewish guild members being overall less likely to incorporate after 1890. Instead, anti-Jewish restrictions seem to have been targeted against corporations in capital-intensive industries.

A second, related, concern is that we lack a counterfactual for would-be *targeted* corporations before the beginning of the capital shock in 1889. Because the first charter with anti-Jewish clauses was issued in 1890, we cannot directly estimate the "treatment effect" of the change in government policy at the industry level, holding unobserved time-invariant characteristics of industries fixed. Theoretically, discrimination could have been caused by some other process, correlated with capital intensity and other observable variables. The central question is whether the lack of discriminatory "pre-trend" before 1890 is evidence of Jewish entrepreneurs selecting into a different set of industries—compared to the post-1890 period—or the conditions that caused discrimination had not yet been in place before 1890, as we argue. We cannot answer this question directly given the available data, but to the extent that other market participants observed a differential treatment of Jewish entrepreneurs after 1890, that should have been reflected in market valuation of corporations in which Jews served as founders. Using the data on 155 corporations whose shares were traded at the St. Petersburg Stock Exchange between 1865 and 1913, we show that stock returns

of corporations founded by Jews outperformed stock returns of other corporations before 1890 but underperformed after. This finding suggests that discrimination against Jewish entrepreneurs was likely not anticipated by the equity capital market.

To further explore the nature of competition between Jewish and non-Jewish entrepreneurs, we test whether the former had a competitive advantage in technology and skills. Historians have argued that minority businessmen—Germans, Jews, and Poles—had higher levels of human and social capital because a disproportionately large share of these minority groups lived in cities, and also because they maintained tight-knit networks (e.g., Rieber, 1982). With such a competitive advantage, Jewish entrepreneurs would have disproportionately clustered in high capital-intensive industries before 1890. Therefore, they could have become targets of discriminatory policy for the reasons unrelated to the capital shock per se. We explore this possibility using a subsample of incorporated factories in 1890, for which we have information on ethnicity of their owners. Specifically, we test whether various measures of factory productivity—revenue per worker, total factor productivity of revenue (TFPR), and horsepower per worker—were systematically related to ethnicity of factory owners. We find that there were no statistically significant differences in productivity between factories owned by Jews and non-Jews in terms of revenue per worker and horsepower per worker; in terms of TFPR, factories owned by Jews were somewhat less productive. This result provides additional support for the hypothesis that discrimination against Jewish entrepreneurs originated in the capital shock rather than the technological "catch-up" of their non-Jewish competitors.

While being focused on Imperial Russia, this paper contributes to the broader political economy of development literature by documenting how certain firms and groups of agents can be selectively excluded from participating in capital markets. At the country-industry level, at least, there seems to be a positive association between how easy it is for firms to attract financial capital and the rate of industrial growth (Rajan and Zingales, 1998).[3] The "traditional" channel whereby legal systems influence the size of capital markets is investor protections (La Porta et al., 1997). In our context, the issue of protection of investors

[3]It should be noted that the existing firm-level evidence on the *independent* contribution of the corporate form to growth and productivity is limited (Gregg, 2019).

per se was less relevant considering that some investors—Jewish entrepreneurs and their partners—were legally restricted from entering capital markets in the first place. Therefore, our study further illuminates the potential mechanisms whereby political institutions and legal systems can shape capital markets and, therefore, economic development.

More generally, we are not aware of any other empirical research that explicitly examines political barriers to entry at the firm level.[4] The lack of empirical evidence in the modern context is not least because such barriers are not legal in most countries. Therefore, researchers have to rely on such indicators of the regulation of entry as the number of procedures, official time, and official cost as proxies for political barriers (Djankov et al., 2002); the main disadvantage of these measures is that they are typically the same for the entire industry or country. The absence of general incorporation law—and democratic norms—in the Russian Empire provides us with a unique research setting. Our main insight is the seemingly higher degree of short-sightedness of authoritarian rulers—the Russian tsars—compared to the "stationary-bandit" view of dictatorships (Olson, 1993; Acemoglu and Robinson, 2006). Acemoglu and Robinson (2006) argue that "external threats often make incumbents more pro-innovation" (p. 117); in this light, Russia's defeat in the Crimean War (1853–1856) was "the turning point in the attitudes of the Russian state to economic development" (p. 128). We disagree with this notion. Considering that anti-Jewish restrictions were more likely in more capital-intensive industries, we reach a paradoxical conclusion: capitalists were blocked from entering the industries where capital was most needed.[5] Rather, the fact that the government seemingly weighed the interests of certain producers against achieving the long-run developmental objectives is consistent with the "oligarchic" model (Acemoglu, 2008; Cheremukhin et al., 2017). In this model, the ruling elite deliberately creates entry barriers, impeding future innovation and growth, to secure current rents.

This paper also speaks to the growing number of studies on ethnic conflict and persecution of minority groups in various historical contexts. It has been argued that inter-ethnic relations

[4]Gregg and Nafziger (2017) and Gregg (2019) also study the process of incorporation in the Russian Empire, but they do not investigate anti-Jewish restrictions nor political barriers more generally.

[5]Russia's largely unsuccessful participation in World War I also demonstrated its technological inferiority.

are shaped by the long-run division of labor between groups (Jha, 2013). The established norms of co-existence can be adversely affected by external shocks that increase inter-ethnic competition (Becker and Pascali, 2019) or political uncertainty about the future (Grosfeld et al., 2018). The main difference between these papers and ours is that discrimination against the minority (the Jews) in our setting did not occur "spontaneously," at the grassroots level, but with direct involvement of the state. Although competition between Jewish and non-Jewish entrepreneurs does play a role in our explanation of anti-Jewish restrictions, it was ultimately the central government who decided the fate of each corporation. Curiously, tsarist policy towards Jews was more "rational" in that it seemed to ration the degree of discrimination from year to year and from industry to industry, in contrast to anti-Jewish pogroms in Germany and Russia, which once began, were uncontrolled (Becker and Pascali, 2019; Grosfeld et al., 2018).

The paper proceeds as follows. In Section 2.2, we provide a brief overview of the state of markets, social relations, and politics in late nineteenth-century Russia. In Section 2.3, we describe construction of the dataset. In Section 2.4, we present our main empirical findings and address some of the alternative mechanisms. The final section concludes.

2.2 Historical background

2.2.1 Capital and capitalists in late nineteenth-century Russia

The defeat in the Crimean War (1856) demonstrated the technological inferiority of Russia's then-feudal economy. The reforms initiated during the reign of Tsar Alexander II (1855–1881), including the emancipation of serfs (1861), were meant to accelerate industrialization. However, the Russian Empire remained a largely agricultural ("backward") economy by the turn of the century, with large-scale private capital being scarce (Gerschenkron, 1962). Cheremukhin et al. (2017) have put forward a different explanation for Russia's underdevelopment: high market entry barriers and monopoly power. This could explain why capital *appeared* more limited than it might actually have been—if it was under-utilized. The recent literature on

the Russian economic history has explored specific frictions that impeded firms' ability to borrow and expand, in particular, the highly politicized process of incorporation (Gregg and Nafziger, 2017; Gregg, 2019).

On the other hand, a number of historical and sociological accounts of late Imperial Russia have stressed the importance of anti-capitalist sentiments in Russian society, not least among the entrenched merchant class (Rieber, 1982; Rogger, 1986; Löwe, 1993). From this perspective, ethnic and religious minorities—Germans, Jews, Poles, and others—were viewed as unwelcome agents of change, whose "cosmopolitan" values, incompatible with paternalism, undermined the moral fabric of the Russian majority.

Before the late 1880s and early 1890s, the merchant class and nobility, the main owners of capital, did not find it in their best interest to invest in the private sector because of the hypertrophied state sector. The state diverted private investment by heavily subsidizing the construction of railroads, perceived as a strategic necessity, and by issuing bonds on the domestic market with a relatively high interest (up to 5%). While not being a direct owner nor manager of railroad corporations, the government guaranteed dividends payable to their stockholders, with the rate of return comparable to that of government bonds (5%). The following quote of a contemporary, who lived in the second half of the nineteenth century, reflects the prevailing business attitude of that age:

> A medium-size [sugar] factory requires up to 2 million rubles of basic capital, and almost as much is needed for operations. [...] However, this capital can be easily transformed into government bonds yielding a guaranteed return of 200 thousand rubles, allowing a fortunate owner of such capital to philosophically reflect on worldly matters under the sun of Biarritz [...] whereas investment in the sugar industry means randomness and insecurity. (Moshenskii, 2014, p. 216)

There were two major stock market booms (*azhiotazh*) in Russia during the nineteenth century. One occurred in 1857, when the government decreased the interest paid on deposits in state-controlled banks from 5% to 4%. After the devastating Crimean War, the government sought to decrease its obligations. At the same time, facilitating investment in non-state assets

was perceived as a benevolent goal by Tsar Alexander II and the finance minister (Shepelev, 1973, pp. 70–71). Unsurprisingly, these were the newly created railroad corporations that benefited from the market boom most. In 1857–1858, state banks lost 159 million rubles of private savings, while the government-guaranteed shares of the Russian Railroad Co. (1857) attracted 75 million rubles, which was an enormous emission at the time (Shepelev, 1973, pp. 74–75).

The second boom, which is the subject of this study, occurred in the 1890s. Like the previous one, it was caused by a change in government policy. By the 1880s, state-subsidized railroad corporations had proved to be corrupt and ineffective; the lack of uniform transportation standards increased the cost of operation, while the low density of the railroads network did not allow corporations to benefit from economies of scale. Instead of continuing to guarantee the 5% return on shares of these corporations, the government forcefully purchased them or exchanged for 4% government bonds. Most railroad corporations were repurchased between 1889 and 1894 (see Table 2.7 in Appendix 2.A and Figure 2.2 below). Around the same time, in 1889–1894, the government forcefully converted 5% bonds to 4% bonds, which happened shortly after the French sovereign debt market became the main creditor of the tsarist government. This took holders of Russian government debt by surprise, who, "having lost one-fifth of their revenue, had to [find a way to] increase it" (Moshenskii, 2014, pp. 117–118). To signify the scale of the policy change, of the 2,628 million rubles of new sovereign debt added during the tenure of Finance Minister Ivan Vyshnegradskii (1887–1892), only 899 million were financed domestically.

The net effect of government interventions in 1889–1894 was that former shareholders had incentives to seek for higher rates of return elsewhere, in particular, in the private equity market. As we argue, this inflow of capital likely created a political economy conflict between market incumbents and entrants, those who were more politically connected and those who were not. We expect that this conflict was particularly acute in relatively capital-intensive industries.

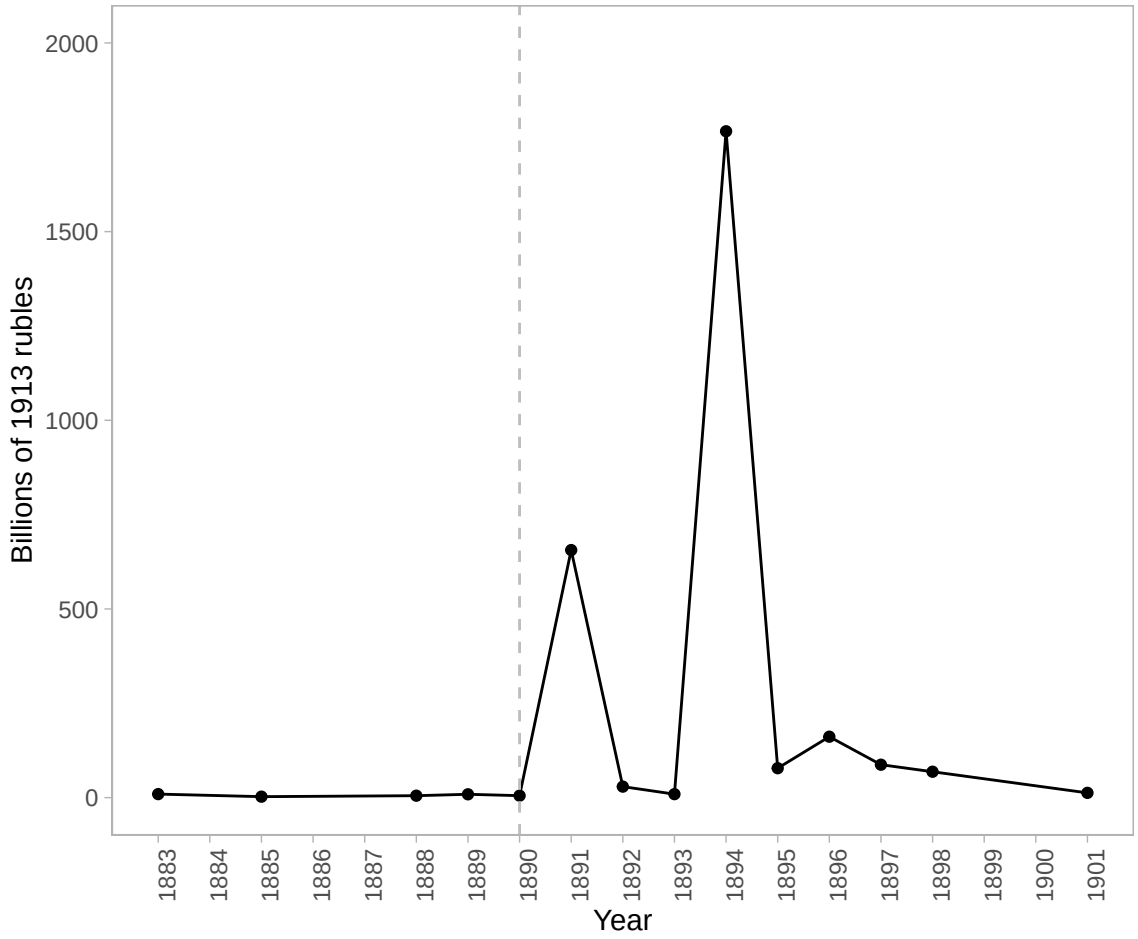


Figure 2.2: The dynamics of the government-initiated capital shock, 1883–1901. The dashed vertical line indicates the year when the first corporate charter with anti-Jewish restrictions was issued (1890). The ruble values are deflated to the 1913 level using the price index in Strumilin (1954). See text and Table 2.7 (Appendix 2.A) for additional information on how each observation is constructed.

2.2.2 Russian corporate law

Incorporation is an important way for firms to attract external capital. Besides issuing equity, the legal entity status, separate from any of its participants, allows corporations to lock in the assets, which in turn provides them with the advantage of being able to invest in long-term, highly specific projects (Blair, 2003). Limited liability of equity investors, a third distinguishing feature of corporations as compared to other enterprise forms, further facilitates inflow of capital, in particular from small investors who do not play an active role in governance (Easterbrook and Fischel, 1985).

The Russian Corporate code, which was enacted in 1836, remained in place, with certain revisions, until the end of the monarchy in 1917 (Owen, 1991). Despite the numerous attempts to reform the Code by the finance ministers from Reutern to Witte to Kokovtsov, its main provision was left intact: prospective entrepreneurs were required to seek permission of the central and local government to establish a new corporation; the tsar himself approved incorporation by signing the corporate charter.[6] It is no surprise that the concession system of incorporation gave rise to bureaucratic arbitrariness (*proizvol*) (Owen, 1991). The processing time could vary from six months, as in the case of the Ramiba Bentwood Furniture Company of Penza (Gregg, 2019, p. 10), to the sixteen years that it took the Poznanski Cotton Company of Lodz to receive a new charter (see Figure 2.3). In 1900, Minister of Finance Sergei Witte wrote to Tsar Nicholas II:

> Even if corporations receive charters ... these charters often restrict participation by foreigners and Jews ... which makes it impossible for these corporations to have enough starting capital. Many manufacturing industries are overseen by other Ministries, [such as] the Ministry of Defense. [...] Regardless of general regulation of enterprises, their fate is at the mercy of numerous local officials, from lower-ranked police officers to general-governors. (Quoted in Shepelev, ed, 1999, p. 357)

[6]The system of incorporation by registration (*iavochnaia sistema*) was only introduced on April 1, 1917 by the new Provisional Government (Owen, 1991, p. 190).

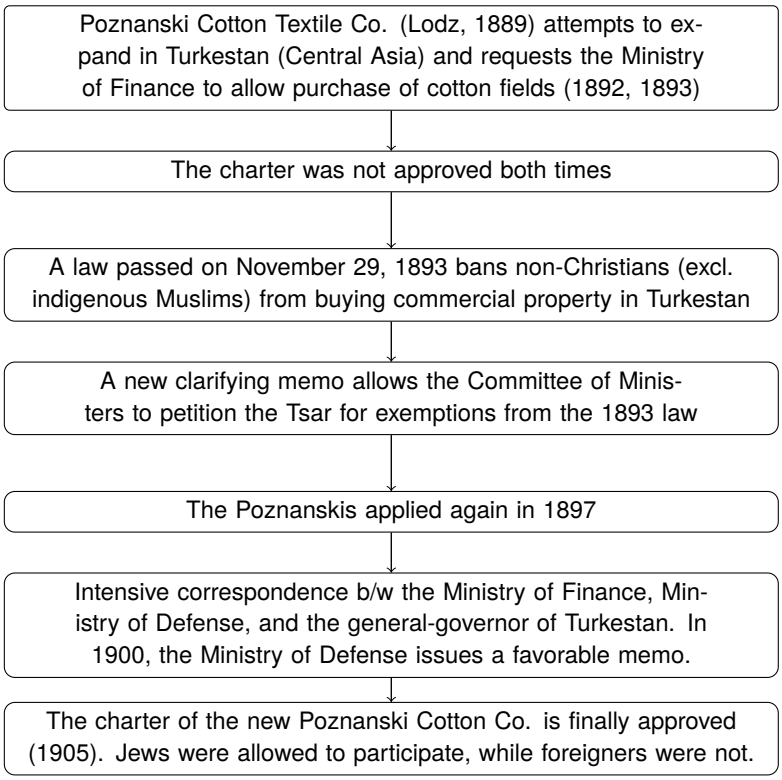


Figure 2.3: Example of the incorporation process: Poznanski Cotton Co. (1905). The Poznanski brothers had Jewish background. The information is from Laverychev (1974, pp. 59–60).

Not only draft charters went through the bureaucratic maze—so did initiatives to reform the system. In 1892, the Department of Trade and Manufacture of the Ministry of Finance created a committee to "explore the possibility of removing barriers to incorporation" (Shepelev, 1981, p. 231). In 1894, the committee's proposal was sent to governors, municipal and rural (*zemskiie*) governments, and advisory councils on trade and manufacturing. The further development of the proposal stalled; in 1899, the Ministry explained the delay by the "diverse interests that would be affected by this legislation" (Shepelev, 1981, p. 232).

The subsequent proposals in the early twentieth century failed as well. The negative impact of the concession system on the industrial growth was well understood by all ministers—the disagreement was primarily due to the fact that incorporation by registration would make it harder to impose ad-hoc restrictions (Shepelev, 1981, p. 234). Under the concession system, every charter was legislation in its own right, and as such it could override the existing regulations and decrees pertaining to a given industry. Therefore, by blocking the initiatives of the Ministry of Finance certain ministers and interest groups sought to reserve the right to decline a charter or to include arbitrary provisions in it.[7]

2.2.3 Jews in the Russian Empire

2.2.3.1 Imperial policy

After annexing large portions of Poland in the late 18th century, Russia became home to the largest Jewish diaspora in the world. By the decrees of 1791, 1804, and 1835, the government restricted their legal residence to the Pale of Settlement. As Gessen (1911) wrote, "the Pale of Settlement was the result of the lobbying efforts of Moscow and Smolensk merchants who feared competition with Jews" (p. 91).

Imperial policy towards Jews was not coherent nor consistent, while its enforcement was not thorough and instead was arbitrary. On multiple occasions, certain tsarist ministers

[7] Owen (1991) seems to disagree with our assessment of the role played by the finance ministers: "The most enlightened ministers, including Reutern, Bunge, and Witte, all preferred the old way: rigid laws tempered by arbitrary exceptions for favored petitioners" (p. 210).

attempted to improve the status of Jews, or weaken the enforcement of the previously passed discriminatory laws. The most important for the subject of this paper is the decree of 1859 that allowed Jewish entrepreneurs—merchants of the first guild—to permanently reside in any imperial city outside the Pale.[8] As a result, the two centers of Russian commerce, Moscow and St. Petersburg, experienced a dramatic increase in the Jewish population (Nathans, 2002).

In 1862, Minister of Finance Michael Reutern introduced a new legislation advocating for an even more comprehensive equalization of rights of Jews and non-Jews. In particular, he questioned that Jews were driving the Russians out of commerce. Instead, "society would be better off under the improved allocation of human capital, decreased smuggling, with simultaneous growth in the manufacturing sector."[9] Such initiatives, though often futile, were not uncommon among high-level officials even at the height of the "official" anti-Semitism in the 1880s (during the reign of Alexander III). In other cases, legislation that sought to soften discrimination was lobbied by local administration due to the negative economic consequences of anti-Jewish restrictions (Raskin, 1993, p. 70). Figure 2.4 depicts the overall dynamics of imperial legislation pertaining to Jews from 1810–1917.

2.2.3.2 Jewish entrepreneurship

Who were Jewish entrepreneurs and how did they differ from the average inhabitant of the Pale of Settlement? Rubinow (1975) points out that "notwithstanding a few individual cases, the number of great Jewish capitalists [in the Pale of Settlement] is small, and that the majority of the Jewish manufacturers are people of moderate means" (p. 541). Since only relatively wealthy individuals, regardless of their background, could become members of the first guild and establish corporations, these are the "individual cases" that we focus on in this paper.

[8]Jewish merchants of the second guild were allowed to reside in the "inner" provinces temporarily. In addition, first- and second-guild members were able to obtain an honorable citizen (*pochetnyi grazhdanin*) status, which also gave the path to legal residence outside the Pale.

[9]As quoted in Ulianova (2010, pp. 324–325).

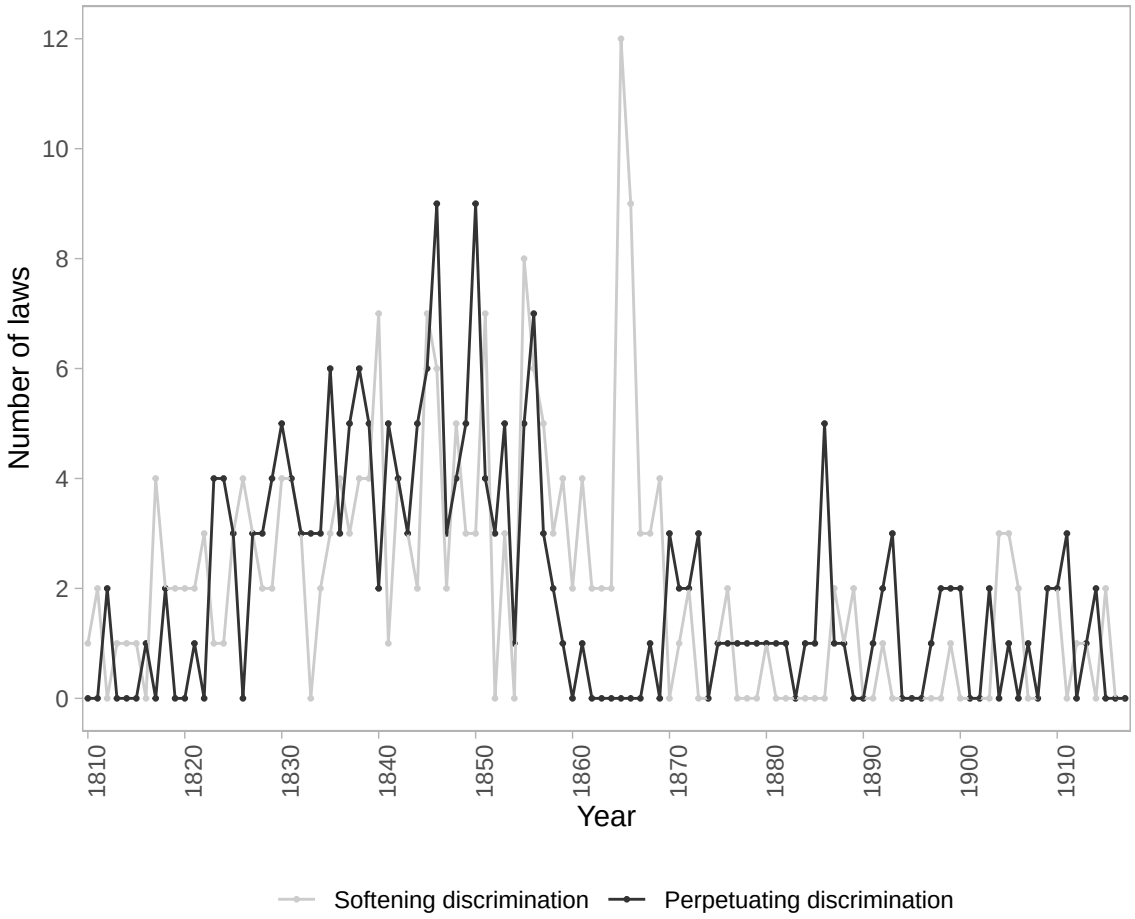


Figure 2.4: Laws concerning the status of Jews, passed by different branches of the central government between 1810 and 1917. The plot is constructed based on the information in Table 1 in Raskin (1993).

Despite the unfavorable legal status of the Pale of Settlement, where Jewish entrepreneurs accumulated capital initially, its geographic proximity to Western Europe was advantageous: "Non-Russian merchants not only reaped commercial and investment advantages from their close and constant contact with foreigners in the ports and frontier towns but also benefited from easy access to Western technology and know-how" (Rieber, 1982, p. 75).[10] Kahan (1983) argues that foreign trade was one of the major sources of Jewish capital, at least in the first half of the nineteenth century (p. 108). External financing was also crucial:

> [T]he Jewish banks made a special effort to attract savings from non-Jews and to borrow from Jewish banks abroad [...] the banks were capable of paying high interest and dividends and their connections with the Jewish banks in Germany and later in France, resulted in capital imports and transfers to Russia. (Kahan, 1983, p. 110)

Over time, Jewish banking grew so important for attracting foreign capital that in 1913 Trade and Manufacture Minister Sergei Timashev warned of the possible harmful impact of anti-Jewish discrimination:

> [B]anning Jews from boards of directors would be quite harmful as corporations not only would be able to attract less Jewish capital [...] but less foreign capital as well. The latter is invested in our manufacturing sector not directly but via private banks, whose directors, in many cases, are Jews. Therefore, prohibiting Jews to oversee individual corporations [in the capacity of members of boards of directors] would decrease foreign capital attracted by the affected corporations. (Quoted in Shepelev, 1987, p. 206)

Historians have pointed out that entrepreneurial activity of Jewish capitalists was not confined to few industries, both in the Pale and beyond (Rubinow, 1975; Kahan, 1983).[11]

[10] We explore whether Jewish-owned factories were indeed more productive below.

[11] "One could have encountered them at the oil wells of Baku, in the gold mines of Siberia, on the fisheries of the Volga or Amur, in the shipping lines on the Dnepr, in the forests of Briansk, on railroad construction sites anywhere in European or Asiatic Russia, on cotton plantations in Central Asia, and so forth" (Kahan, 1983, p. 111).

2.2.3.3 Jewish entrepreneurs in Moscow

To illustrate the complex relations between the central government, local authorities, and Jewish entrepreneurs, we consider the case of Moscow in the 1890s.

In 1891–1905, the governor general of the Moscow region was Grand Duke Sergei Alexandrovich, who was the brother of Tsar Alexander III and uncle of his successor, Nicholas II. Historians have argued that, unlike his predecessor, Sergei Aleksandrovich had strong prejudice against Jews (Aizenberg, 2003, p. 337). Shortly after taking office, in 1891–1892, the general governor issued a decree that prohibited Jewish artisans from residing in the Moscow region. By some estimates, 86% of Jews were expelled from Moscow over the course of few months (Aizenberg, 2003, p. 338). Jewish guild merchants, including owners of factories and corporations, were allowed to stay. Moreover, during the 1890s the number of Jewish merchants in Moscow's first guild increased steadily, reaching 267 (30%) in 1898. Supported by Russian guild members who feared the growing (albeit exaggerated) influence of Jews, in 1899 the Moscow general governor lobbied the tsarist government to impose a 33% cap on Jewish membership in the first guild (Aizenberg, 2003, p. 354). This restriction remained in place until the 1917 Revolution.

2.2.3.4 Anti-Jewish clauses in corporate charters

Jews that moved from the Pale to the "interior" provinces of Russia following the liberalization in 1859 "met with the resistance of entrenched economic interests. [...] There were indeed complaints about the new ways of doing business introduced by the Jews, which did not sit well with old regulated forms of trade stemming from a corporate organization and many local regulations against the Jews applied" (Löwe, 1993, p. 58).

Starting from 1890, upon approval by the government, certain corporate charters received additional clauses that restricted management and ownership of the respective companies and their property by Jews. Even if such clauses did not ban Jews altogether, they often made their participation economically meaningless. For example, e.g., if a textile company owned by Jews was not allowed to purchase or lease property in rural and/or cotton-growing areas,

it could not successfully compete against corporations that did not face such restrictions. The first charter issued with such discriminatory clauses was that of the Zarozhan Mfg. Co. (1890), headquartered in Odessa. It said, "Jews can be neither shareholders, nor members of the Board of Directors, nor real estate managers. This condition must be indicated on the shares" (as quoted in Levin, 1902, p. 223).

Not all Jewish entrepreneurs faced discrimination. Wealthiest entrepreneurs, such as Goratsii Günzburg, were creditors to the Tsar and were granted a nobility status.

2.3 Construction of the dataset

2.3.1 Incorporations and restrictions

Our main data source on corporations is the RUSCORP database (Owen, 1992), which contains information on firms whose charters were accepted by the Ministry of Finance. The "legislative" nature of each corporate charter is reflected in the fact that it was eventually published in the Complete Collection of Laws (*Polnoe sobranie zakonov Rossiiskoi Imperii*). These charters record characteristics of corporations at inception, such as the amount of basic capital; their functions; restrictions, if any, on their operations; basic information on their founders. While the compiler of the RUSCORP himself acknowledges that distinguishing new corporations from re-chartered ones may be challenging (and in our experience we have identified corporations that received charters but are not included in the RUSCORP),[12] this database has been used as the main reference in the literature (Hillmann and Aven, 2011; Gregg and Nafziger, 2017; Gregg, 2019).

The RUSCORP also codes anti-Jewish restrictions contained in corporate charters (the variables PROP, OWN, and MAN), albeit using this information poses certain challenges. The first is that restrictions against Jews and foreigners, though possibly different in nature, were not clearly separated when assigning the codes.[13] Second, Owen (1992) notes that PROP

[12]Some of these corporations are listed in Levin (1902).

[13]Additionally, the OWN variable in the database contains restrictions with code 7, which is not mentioned

and OWN "often appear in charters in an inverse relationship to one another" (Codebook, p. 5). In the database itself, they *always* do, which we believe is an artifact of compilation and does not necessarily reflect the nature of the historical administrative process. Third, with the exception of Turkestan, the RUSCORP fails to specify whether restrictions in a certain area or industry were idiosyncratic (i.e., Jews had full legal rights otherwise) or whether a given corporation was discriminated according to general legislation. Fourth, by comparing records in the RUSCORP and actual charters we have detected coding errors.[14]

Given these challenges, our preferred source on anti-Jewish restrictions is Levin (1902), who lists all corporations that were created by July 1902 and whose charters contained discriminatory clauses. Despite the shorter time span (the RUSCORP extends to 1913), the information provided in Levin (1902) is more complete and less ambiguous for our purposes. Levin (1902) classifies all charters by three groups. The first one includes corporations whose charters had unconditional restrictions against Jews regardless of where a given corporation operated. Those were restrictions that did not allow Jews to be managing directors, and, in most cases, shareholders as well. The second category includes certain corporations in the Pale of Settlement, in which Jews could not be shareholders and managing directors. The last category includes those corporations that allowed Jewish ownership but could not purchase property in the Pale of Settlement.

For the sake of comparison, we collapse all three types of restrictions from Levin (1902)[15] and the variables PROP, OWN, and MAN from the RUSCORP with at least some reference to Jews (see Figure 2.7). In what follows, we use what Levin codes as restrictions of the "first type" as our outcome variable. Figure 2.8 shows the intensity of these restrictions by province. As one can see, in some provinces more than half of all new corporate charters

in the Codebook.

[14]For instance, the Kerting Bros. Machinery Co. (1904) would have been coded as having no anti-Jewish capital restrictions according to the RUSCORP. However, the note to paragraph 3 of the charter says that Jews and foreigners cannot own or lease property in certain areas. The charter can be accessed at https://dlib.rsl.ru/viewer/01004732097.

[15]Excluding the ones applied retrospectively, which are missing in the RUSCORP.

contained anti-Jewish clauses, while in others discrimination was absent.[16]

2.3.2 Stock returns

To test whether the change in government policy was expected by the market, we use the database on the prices of stocks traded at the St. Petersburg Stock Exchange in 1865–1913 assembled by Goetzmann and Huang (2018). We have calculated monthly returns (for two consecutive months), as well as annual returns (the average of monthly returns in a given year). We have merged the stock returns data with the RUSCORP using corporations' names. The resulting number of the matched corporations is 155. We use this data to test whether the stocks of corporations owned by Jews differentially underperformed after 1890, which would imply that the stock market did not expect the change in government policy (otherwise, the stock prices would have adjusted prior to the shock, and we would see no differential performance after 1890).

2.3.3 Factories and industries

Our main source on industry-level variables is Orlov (1894), who compiled official data from the Department of Trade and Manufacture (Ministry of Finance) for the year 1890. Using Orlov (1894), we have collected information on all factories in European Russia and manually classified them by 3-digit SIC (Standard Industrial Classification) industries.[17] Exclusion of the so-called miscellaneous industries,[18] which are too broad to be meaningful, restricts our sample to 85 and 19313 factories. Of these, we further exclude the industries where there were no incorporations between 1891 and 1902 (according to the RUSCORP), as well as the factories lacking the information on machine power and/or the number of workers. The resulting sample that we use in the main part of our analysis includes 73.

[16]It should be noted that Figure 2.8 does not reflect the significant variation in the total number of all incorporations across provinces.

[17]Use of 3-digit SIC codes is common in the literature (e.g., Atack et al., 2008).

[18]They have the SIC codes of the form "XX99."

For each industry, we measure capital intensity as the ratio of total horsepower (almost exclusively, steam engine power) and the total number of workers. Ideally, to measure capital intensity, we would prefer to use the ratio of aggregate capital and aggregate wages. To the best of our knowledge, there is no reliable data that goes back to the nineteenth century that would allow us to calculate such measures—not only for the Russian manufacturing sector, but also for industries in Western Europe and North America. Great Britain, for example, conducted its first Census of Production in 1907. The U.S. Census of Manufacturers was first carried out in 1850, and it reported the aggregate capital used until 1919. In the subsequent years this information was not provided because that it was "so defective as to be of little value except as indicating very general conditions. [...] While there are some establishments whose accounting systems are such that an accurate return for capital could be made, this is not true of the great majority, and the figures, therefore, do not show the actual amount of capital invested" (Flux, 1924, p. 356).

We acknowledge the possible weakness of our measure of capital intensity, namely that the differential adoption of steam engines across industries can reflect the differences in the production process (technological level) rather than capital intensity per se.[19] Somewhat reassuringly, using the 1850–1880 U.S. Census of Manufacturers data, Atack et al. (2008) find a strong correlation between capital intensity and the percent of factories using steam or water power.

We deflate all the money variables (output in rubles, the amount of basic capital) to the 1913 level using the price index in Strumilin (1954).

2.3.3.1 Comparison with the U.S. census of manufacturers

To cross-validate our measure of capital intensity, we use the information on fixed assets, wages paid, and the number of workers in each industry from the 1890 U.S. Census of Manufacturers. We code the U.S. industries using the same industrial classification as in

[19] E.g., Franck and Galor (2017) use the adoption of steam engines in France in the late nineteenth century as a measure of technological progress.

Table 2.1: Cross-validation of the capital intensity measure

	Horsepower per worker	Fixed assets per $1 of wages	Fixed assets per worker
Capital Intensity, Russia	0.54	0.33	0.33

Notes:
This table displays correlations between the capital intensity measure we calculate for Russian industries using Orlov (1894), and analogous measures for U.S. industries, calculated using the data from the 1890 Census of Manufacturers.

Russia's case. Because of the way the data was aggregated and reported in the Census, we are not able to match a number of industries.[20]

We expect the measures of capital intensity for the U.S. and Russian industries to be positively correlated. Table 2.1 suggests that there is indeed a positive, if modest, correlation. Unsurprisingly, the capital intensity index for the U.S. industries measured the same way—total horsepower per worker—has the highest correlation (0.54). The correlation of our index for Russian industries with the ratio of fixed assets and total wages is 0.33 (in the U.S. data, this correlation equals 0.49).

2.3.4 Founders

We match founders from the RUSCORP database by their first, last, and middle names and dates of incorporation (i.e., we ensure that the time span between the creation of a pair of corporations by the same individual is not too large). For the manufacturing and banking sectors, we have identified 7,052 unique founders (out of 8,639). Overall, 66 percent of corporations had more than one founder. There is one instance when a corporation had 77 shareholders, but on average there were roughly 3 founders per corporation. This pattern is not surprising, since only 155 corporations had their shares publicly traded at the St. Petersburg stock exchange. According to the RUSCORP data on corporations founded between 1835 and 1913, the proportion of female founders was 6 percent. 11 percent of founders were Jewish.

[20]Unfortunately, disaggregated data from the 1890 Census no longer exists because it was destroyed by a fire in 1921.

2.3.5 Guild members

Traditionally, members of merchant guilds constituted a separate privileged estate. However, by the 1890s, the status of a guild member ceased to be hereditary and was instead an instrument of fiscal and administrative control. All owners of factories, that had steam-powered machinery or employed more than sixteen workers, had to obtain a first- or second-guild certificate (Owen, 1991, p. 61). To become a member of either guild, one was not required to obtain permission of other guild members—only to purchase a certificate (i.e., pay an annual membership fee), the cost of which varied by location. Such location was defined as the place the corresponding business activity took place. First-guild certificates were more expensive but they also allowed their holders to run larger businesses. If one's total annual production exceeded 15,000 rubles, or if he or she engaged in wholesale trade, purchase of a first-guild certificate was required.

We have collected data on all members of the first and second merchant guilds (as of 1890) in three major commercial and industrial centers of the Empire—St. Petersburg, Moscow, and Odessa—11,172 in total. We are not aware of similar data sources for other cities around 1890. While by necessity we omit other important centers, such as Kiev, Riga, and Warsaw, we believe that this only affects the interpretation (external validity) of our analysis and not internal validity.[21] Also, due to the capitals' disproportionately large economic and political role, many merchants residing elsewhere sought to join the first and second merchant guilds of St. Petersburg and Moscow. 6 percent of all merchants were Jewish.

2.4 Empirical analysis and discussion

2.4.1 Hypotheses and empirical strategy

We expect a positive relationship between an industry's capital intensity and the probability of anti-Jewish capital restrictions in that industry in the aftermath of the change in government

[21] With more than one million inhabitants according to the 1897 Imperial Census, St. Petersburg and Moscow were the two largest cities. Warsaw was the third-largest city (684,000), Odessa fourth (404,000), Riga sixth (282,000), Kiev seventh (248,000).

policy, which we define as the period from 1891 onward. While the government began repurchasing shares in railroad corporations and converting government bonds earlier, we do not expect these measure to have taken full effect until later in the 1890s, not least because the incorporation process was time-consuming. The first recorded charters with anti-Jewish clauses—three in total—are dated 1890, and we drop them from analysis. Additionally, we are only able to measure capital intensity as of 1890.

Because the timing of our "treatment"—increased investment activity in response to the abrupt change in government policy—coincides with the beginning of anti-Jewish restrictions, we are not able to use a differences-in-differences framework and to control for the unobserved time-invariant characteristics of industries.[22] Instead, we rely on identifying variation at the *firm* level.

In each cross-section, all incorporations were either existing establishments (factories) or new enterprises. The former could rely on cash flow from operations and were less dependent on external finance than new enterprises. Conditional on that they *already* operated in the market, they were a lesser threat to their competitors than entrants. Additionally, all else equal, owners of existing factories likely had greater political weight. Therefore, we expect that discrimination against corporations that were new enterprises was more frequent. We test this proposition using a pooled probit model with year fixed effects.

2.4.2 Stock returns

Using the St. Petersburg Stock Exchange data, we estimate the following process for stock returns:

$$\begin{aligned} R_{ijmrt} = {} & \beta_1 JewishFounder_{ijrt} + \beta_2 JewishFounder_{ijrt} \times PostShock_{mt} \\ & + \gamma' x_{ijrt} + \delta_j + \psi_m + \xi_t + \nu_r + \varepsilon_{ijmrt}, \end{aligned} \tag{2.1}$$

where m is month, t year, j industry, i corporation, r region. R_{ijmrt} are stock returns. $JewishFounder_{ijrt}$ is the indicator variable equal to one if one of the i-th corporation

[22] In other words, the left-hand side part would be zero for all industries before 1890.

founders was Jewish (based on the RUSCORP data). $PostShock_{mt}$ is the indicator variable equal to one after January 1890, when we observe the first anti-Jewish restriction in the charters data. The corporation-level characteristics we control for, x, are whether the corporation i has a high-status founder (a nobleman or senior official), a Jewish founder, or a foreign founder. δ_j, ψ_m, ξ_t, and ν_r are the full sets of fixed effects: industry, month, year, and region. Region fixed effects roughly control for market access, based on the geographic location of a corporation's operations (from the RUSCORP).[23] We cluster the standard errors at the corporation level.

We test whether stock returns of corporations owned by Jews outperformed stock returns of other corporations before 1890 but underperformed after. The estimation results are presented in Table 2.2. The empirical pattern we observe is consistent with the explanation that the market did not expect discrimination against Jewish entrepreneurs prior to the change in government policy. Corporations with Jewish founders had higher stock returns before 1890 and lower returns after 1890, and the pattern holds both for the monthly and annual data.[24]

We cannot estimate a more sophisticated model—with a separate process for volatility of stock returns—because of the highly unbalanced nature of the panel. Another caveat is that we can only calculate returns for the stocks traded at the St. Petersburg Stock Exchange due to the data availability. Therefore, the results in Table 2.2 should be viewed as suggestive.

2.4.3 Capital intensity: validity check

As a next step, we investigate how accurately our measure of capital intensity reflects the underlying differences across industries. We use the following intuitive benchmark. We test

[23]The region is an aggregate variable equal to one of the following categories: the Central region, West, North, South, Baltic, Volga-Ural, Poland, Finland, Siberia, and Caucasus. An additional category, defined in the RUSCORP as the "entire Empire," is for corporations that operated in all regions.

[24]We use annualized returns to address the high volatility of monthly returns.

Table 2.2: Stock returns at the St. Petersburg Stock Exchange do not predict capital restrictions against Jews pre-1890

	Dependent variable: Stock return			
	Monthly		Annual	
	(1)	(2)	(3)	(4)
Jewish founder	0.279*	1.220***	0.186	1.096***
	(0.148)	(0.207)	(0.210)	(0.287)
Jewish founder × Post-1890		−1.070***		−1.153***
		(0.255)		(0.363)
Foreign founder	0.287**	0.308**	0.308	0.340*
	(0.135)	(0.129)	(0.197)	(0.194)
High-status founder	−0.151	−0.173	0.033	0.001
	(0.114)	(0.113)	(0.172)	(0.168)
Industry FE	✓	✓	✓	✓
Month FE	✓	✓		
Year FE	✓	✓	✓	✓
Region FE	✓	✓	✓	✓
Corporations	155	155	155	155
N	3,547	3,547	851	851
R^2	0.138	0.142	0.270	0.279

Notes:

***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.
Standard errors, clustered by corporation, in parentheses.
Monthly returns are based on two consecutive months.
Annual returns are averages across monthly returns.

whether a corporation's basic capital is correlated with capital intensity of its industry:

$$log(Basic\ capital)_{ijrt} = \beta CI_{jr,1890} + \gamma' x_{ijrt} + \lambda_t + \delta_r + \gamma_j + \varepsilon_{ijrt}, \tag{2.2}$$

where $log(Basic\ capital)_{ijrt}$ is the basic capital of the corporation i (in 1913 rubles); $CI_{jr,1890}$ is capital intensity of the industry j in the region j in 1890; λ_t, δ_r, and γ_j are the full sets of year, region, and industry fixed effects; ε_{ijrt} is an unobserved error. Year fixed effects absorb common shocks, such as recessions. Similar to Equation (2.1), we control for corporation-level characteristics x_{ijrt}: whether the corporation i has a high-status founder (a nobleman or senior official), a Jewish founder, or a foreign founder. Controlling for social status is important because lobbying for restrictions could be more successful when the founder of the new firm had connections in the government. We cluster standard errors at the industry level.

Reassuringly, the results in Table 2.3 seem to be consistent with the notion that corporations in relatively high capital-intensive industries tend to have larger basic capital. Also, this relationship appears to be monotonic. In other words, our measure of physical capital—total horsepower per worker—predicts the amount of financial capital reasonably well. We estimate Equation (2.2) separately for all incorporations (models (1)–(2), Table 2.3) and for new corporations only (models (3)–(4), Table 2.3). In baseline models (1) and (3) we do not include region and industry fixed effects, since a corporation's location, as well as its choice of industry, may be endogenous. Including both region and industry fixed effects does not change our main result: capital intensity at the industry/region level remains positively correlated with basic capital.

2.4.4 Capital intensity: probability of restrictions

For corporation i formed in industry j, and year t, we estimate the following regression:

$$Pr(y_{ijt} = 1) = \Phi(\beta CI_{j,1890} + \gamma' x_{ijt} + \lambda_t). \tag{2.3}$$

Here, y_{ijrt} is a dummy that equals 1 if a capital restriction is imposed (the first category

Table 2.3: Measured capital intensity is correlated with financial capital

	Dependent variable: log(Basic capital)			
	All incorporations		New enterprises	
	(1)	(2)	(3)	(4)
Capital intensity	0.474***	0.362***	0.742**	0.643**
	(0.172)	(0.118)	(0.299)	(0.281)
Joint-stock company	0.375***	0.355***	0.534***	0.518***
	(0.066)	(0.087)	(0.166)	(0.186)
High-status founder	−0.133**	−0.051	0.039	0.153
	(0.055)	(0.061)	(0.141)	(0.153)
Jewish founder	0.309***	0.312***	0.517***	0.569***
	(0.107)	(0.099)	(0.190)	(0.173)
Foreign founder	0.052	0.034	−0.001	0.001
	(0.058)	(0.054)	(0.108)	(0.087)
Year FE	✓	✓	✓	✓
Region FE		✓		✓
Industries	73	73	73	73
Regions	11	11	11	11
N	936	936	269	269
R^2	0.154	0.239	0.264	0.362

Notes:

***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.
Standard errors, clustered by industries, in parentheses.
Basic capital is measured in thousands of 1913 rubles.

as classified in Levin, 1902, i.e., unconditional restrictions against Jews, regardless of where a corporation operated). $CI_{j,1890}$ is capital intensity of the industry j in the region j in 1890. We include a set of control variables at the industry j level, such as the size of the industry and whether this industry had an excise tax. For each corporation, we control for whether its headquarters were located in the Pale of Jewish Settlement, whether at least one of the founders had a noble status, and whether it was a joint-stock company. In addition, we include a dummy for whether at least one of the founders was also a founder of a bank,[25] which we use as a proxy for capital.

Table 2.4 displays the results of estimating Equation (2.3) using a probit model with year fixed effects. The standard errors are clustered at the industry level. The first panel (models (1) and (2)) in Table 2.4 shows the results for all incorporations. In the second panel (models (3) and (4)), we estimate Equation (2.3) using the subsample of new enterprises. In Figure 2.5, we plot predicted probabilities and conditional marginal effects of capital intensity for all incorporations (model (2)) and separately for new enterprises (model (4)), along with their 95% confidence intervals.

It is easy to see that Equation (2.3) is plagued by a selection problem: given the high procedural costs of incorporation, Jewish entrepreneurs could have rationally chosen not to incorporate if they anticipated being discriminated against. Also, discrimination may have had an *indirect* effect on Jews by deterring non-Jews from collaborating with them and thus decreasing the odds of successful incorporation.[26] In either case, selection would bias our estimates downwards; therefore, the findings we report here are conservative.

If a corporation increases its capital intensity from 0.08 (the lower 25th percentile of the capital intensity distribution, i.e., low capital intensity) to 0.28 steam horsepower per capita (the upper 25th percentile of the distribution, i.e., high capital intensity), the predicted probability of a capital restriction increases roughly from 5.9 to 7.4 percent. The baseline probability of facing a capital restriction is 12.8 percent (model (2) in Table 2.4), therefore,

[25]Such overlap is possible because our main sample only includes manufacturing corporations.

[26]See Hillmann and Aven (2011) for suggestive evidence along these lines.

Table 2.4: Capital restrictions are relatively more common in more capital-intensive industries (manufacturing, 1891–1902)

	Dependent variable: Pr(Restriction against Jews=1)			
	All incorporations		New enterprises	
	(1)	(2)	(3)	(4)
Capital intensity	0.547**	0.569**	0.982**	0.979**
	(0.249)	(0.264)	(0.483)	(0.487)
Log(Industry size)	−0.037	−0.033	0.019	0.034
	(0.047)	(0.046)	(0.084)	(0.084)
Industry with an excise tax	0.904***	0.873***	0.699	0.562
	(0.205)	(0.208)	(0.458)	(0.474)
Inside the Pale	0.329***	0.324***	0.412	0.437
	(0.122)	(0.120)	(0.267)	(0.267)
Joint-stock company	−0.140	−0.169	−0.539*	−0.579
	(0.169)	(0.185)	(0.308)	(0.398)
High-status founder	0.169	0.189	0.176	0.294
	(0.156)	(0.160)	(0.272)	(0.298)
Founder banker		0.597**		0.654
		(0.292)		(0.574)
Pr(Y=1)	0.128	0.128	0.123	0.171
Year FE	✓	✓	✓	✓
Industries	73	73	47	47
N	936	910	269	263
Log Likelihood	−304.074	−286.081	−93.701	−87.761

Notes:

***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.
This table displays the maximum likelihood estimates for Equation (2.3).
Standard errors, clustered by industries, in parentheses.
For each industry, capital intensity is defined as horsepower per worker.

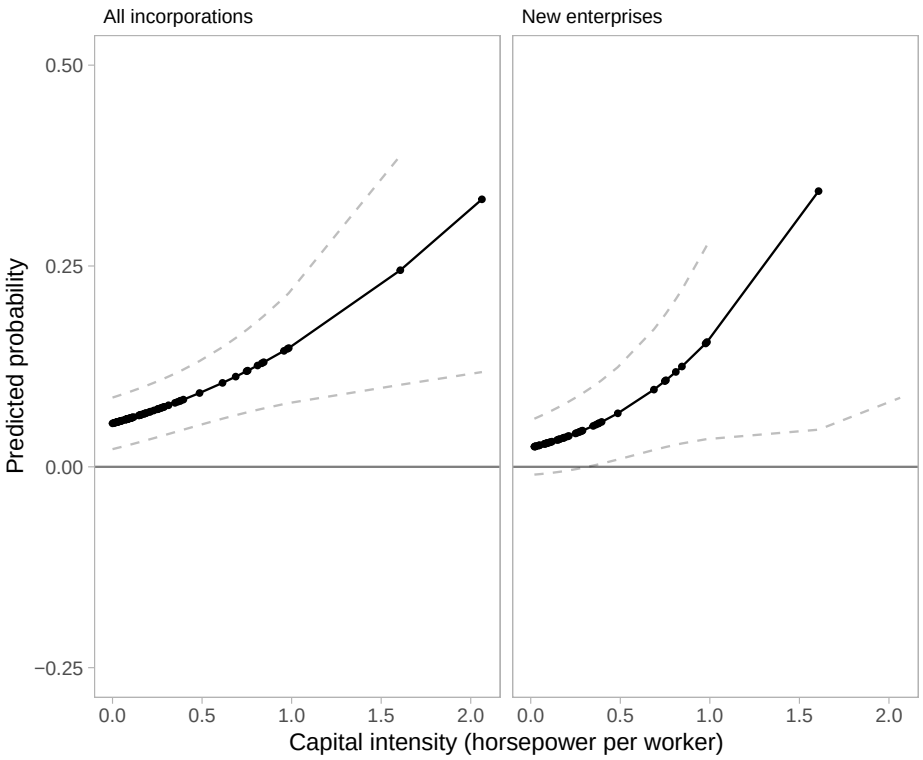


Figure 2.5: Predicted probabilities for capital intensity (models (2) and (4) in Table 2.4)

the 1.5 p.p. increase is a substantively large effect. The risk of anti-Jewish restrictions in a high capital-intensive industry was almost 11.7 percent higher than in a low capital-intensive industry.

Whether a given industry had an excise tax could be an important confounding factor, at least as far as the government's interests are concerned. There are three such industries: production of wine, tobacco, and sugar. On the one hand, the government may have favored the creation of monopolies and therefore sought to limit competition. In the wine industry, the government introduced its own monopoly in 1894. In the sugar industry, producers formed a formal government-approved syndicate in 1895. The tobacco industry was highly concentrated in the late 1890s, although the formal syndicate was only formed in 1914. On the other hand, the stream of excise tax revenues should have remained high enough, therefore, it was in the government's industry to facilitate industrial growth by allowing Jews to invest and create corporations. Which consideration prevailed is ultimately an empirical question. For model (2) in Table 2.4, the average marginal effect of moving from an industry without

an excise tax to an industry with an excise tax is 15 p.p. (10 p.p. for model (4)). The average marginal effect of having a founder who was also a founder of a bank is 10 p.p. in model (2) and 12 p.p. in model (4). Combined, these patterns are consistent with the notion that non-Jewish entrepreneurs sought to limit inflow of capital into their industries.

2.4.5 Factory productivity

An alternative explanation for the mechanism of discrimination we suggest could be that factories owned by Jews were more productive, and therefore Jewish entrepreneurs threatened their competitors on the market. Higher productivity could stem from superior technology or better management practices, which would be consistent with certain historical accounts of Jewish entrepreneurs and entrepreneurs from other minority backgrounds, such as Germans and Poles (Rieber, 1982; Owen, 1991). We believe that was not the case. If anti-Jewish capital restrictions had been due to the differences in productivity alone, they would have been in place before 1890, unless non-Jewish entrepreneurs experienced a "catch-up" around 1890.

For a subsample of incorporated factories, i.e., those that were property of corporations, we can test this proposition explicitly thanks to the information on founders' ethnicity in the RUSCORP. By merging our main factory dataset with the RUSCORP, we identify 457 factories that belonged to 321 unique corporations (some corporations owned multiple factories). Although incorporated factories were not representative—they were, on average, larger and more productive (Gregg, 2019)—the richer information on such factories allows us to test hypotheses that would be difficult to test otherwise. Additionally, this bias would strengthen our previous results if we were to find that incorporated factories owned by Jews were no more productive than those owned by non-Jews.

We estimate the following equation:

$$log(Productivity_{pij}) = \alpha + \beta JewishFounder_{ij} + x'_{ij}\delta + \varepsilon_{ij}, \tag{2.4}$$

where factory p is owned by corporation i in industry j; x_{ij} is the vector of control variables.

We cluster standard errors by corporations, since one corporation could own several factories in the same industry.

First, following Gregg (2019), we use revenue per unit of labor as a proxy for a factory's productivity. We also calculate firm-level productivity as total factor productivity of revenue (TFPR), based on the approach in Hsieh and Klenow (2009). Under the assumption of the Cobb-Douglas production technology in each industry, TFPR can be calculated as follows:

$$TFPR_{pij} \approx (MRPK_{pij})^{\alpha_j} (MRPL_{pij})^{1-\alpha_j}, \tag{2.5}$$

where $MRPK$ is a marginal product of capital, $MRPL$ is a marginal product of labor.

Finally, following Franck and Galor (2017), we use horsepower per worker as another proxy for advanced technology (48 factories out of 457 did not have a steam engine).

Table 2.5: Differential factory productivity by owners' ethnicity (incorporated factories sample, 1890)

	TFPR	Revenue per worker	Horsepower per worker
	(1)	(2)	(3)
Jewish founder	−0.255**	−0.178	−0.056
	(0.117)	(0.124)	(0.050)
Foreign founder	−0.188**	0.056	0.127***
	(0.091)	(0.086)	(0.035)
Joint-stock company	0.185*	0.220**	0.185***
	(0.106)	(0.105)	(0.042)
High-status founder	0.032	0.058	0.085**
	(0.102)	(0.099)	(0.040)
Constant	1.474***	1.558***	0.255***
	(0.063)	(0.060)	(0.024)
N	297	410	410
Adjusted R^2	0.029	0.007	0.084

Notes:
***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.
Standard errors, clustered by corporations, in parentheses.
Revenue per worker is the total annual output (in 1913 rubles) per worker.
We use the inverse hyperbolic sine transformation of the dependent variable.

If the alternative explanation about the superior business practices and higher productivity of Jewish entrepreneurs holds, we should observe a positive effect of having at least one

Jewish founder on the factory's productivity. The results in Table 2.5 suggest that factories owned by Jews had similar productivity in 1890 compared to the productivity of the factories owned by non-Jews (in terms of revenuer per worker and horsepower per worker). The only statistically significant difference in productivity that we find is for the TFPR measure. We can see in Table 2.5 that for TFPR the effect goes in the opposite direction: productivity in 1890 was lower for factories owned by Jews compared to factories owned by non-Jews.

2.4.6 Guild members: decision to incorporate

We examine the decision to create a corporation at the individual level estimating the following equation:

$$Pr(y_{ijt} = 1) = \sum_{T=-6}^{4} \beta_T Jewish_{ij} \times \mathrm{I}\{t = T\} + \delta_i + \lambda_t + \psi_j t + \varepsilon_{ijt}, \tag{2.6}$$

where δ_i and λ_t are the sets of individual (merchant-specific) and time fixed effects. $Jewish_{ij}$ is the dummy variable whether the ith merchant in the jth city is Jewish. $\mathrm{I}\{t = T\}$ is the dummy variable for a 5-year interval in the period 1860–1913 (1885–1890 is a baseline 5-year period). We also add city-specific time trends, $\psi_j t$. If the discriminatory policies introduced by the tsarist government after 1890s had a deterrence effect on Jewish merchants, we expect to see negative coefficients β_T after 1890.

The results in Table 2.6 suggest that there is no evidence in favor of the deterrence effect: Jewish merchants were not less likely to incorporate compared to their non-Jewish competitors after the first anti-Jewish restriction was introduced in 1890. In fact, we observe the opposite effect: Jews were more likely to incorporate than non-Jews in 1860–1885, and even right after the restrictions were introduced, in 1895–1900. These results should be viewed as suggestive. The overall percentage of the merchants who incorporated during the period 1860–1913 is only 4.1 percent, therefore, if we look at the probability of incorporation for a given merchant over time it becomes an extremely rare event.

Table 2.6: Incorporation by merchants of the first and second guild

	Dependent variable: Pr(Incorporation=1)			
	All		First guild	Second guild
	(1)	(2)	(3)	(4)
Jewish × 1860–5	0.001**	0.001**	0.002**	0.0001***
	(0.0004)	(0.0004)	(0.001)	(0.00005)
Jewish × 1865–70	0.001*	0.001*	0.002**	−0.00003
	(0.0004)	(0.0004)	(0.001)	(0.0001)
Jewish × 1870–5	0.001	0.001	0.0002	0.002
	(0.001)	(0.001)	(0.002)	(0.002)
Jewish × 1875–80	0.002**	0.002**	0.002	0.002*
	(0.001)	(0.001)	(0.001)	(0.001)
Jewish × 1880–5	0.002*	0.002*	0.005*	0.0004
	(0.001)	(0.001)	(0.003)	(0.001)
Jewish × 1890–5	0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.002)	(0.001)
Jewish × 1895–1900	0.003**	0.003**	0.006*	0.003*
	(0.002)	(0.002)	(0.004)	(0.001)
Jewish × 1900–5	0.0001	0.0001	0.00003	0.0003
	(0.001)	(0.001)	(0.002)	(0.0005)
Jewish × 1905–10	0.001	0.001	0.002	0.0001
	(0.001)	(0.001)	(0.002)	(0.001)
Jewish × 1910–13	0.001	0.001	0.004	−0.00002
	(0.001)	(0.001)	(0.002)	(0.001)
Pr(Y=1)	0.000842	0.000842	0.00288	0.000585
Year, merchant FE	✓	✓	✓	✓
City-specific trends		✓		
Merchants	11,172	11,172	1,256	9,916
Merchants incorporated	415	415	139	276
N	603,288	603,288	67,824	535,464
Adjusted R^2	0.012	0.012	0.022	0.006

Notes:

***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.
Standard errors, clustered by merchant, in parentheses.
The reference period is 1885–1890.

2.5 Conclusion

In the Russian Empire, the incorporation process was highly politicized. Starting from 1890, the Russian government selectively restricted investment and ownership of corporations by Jews. This paper explores the determinants of this discriminatory policy. We argue that the cross-industry variation in anti-Jewish restrictions can be explained by increased competition between Jewish and non-Jewish entrepreneurs in the capital market. Between 1889 and 1894, the government forcefully converted bonds and repurchased shares of railroad companies, decreasing the rate of return on the assets that were previously deemed as safe and attractive investments. As a result of this intervention, large amounts of private capital were freed and had to be reinvested elsewhere.

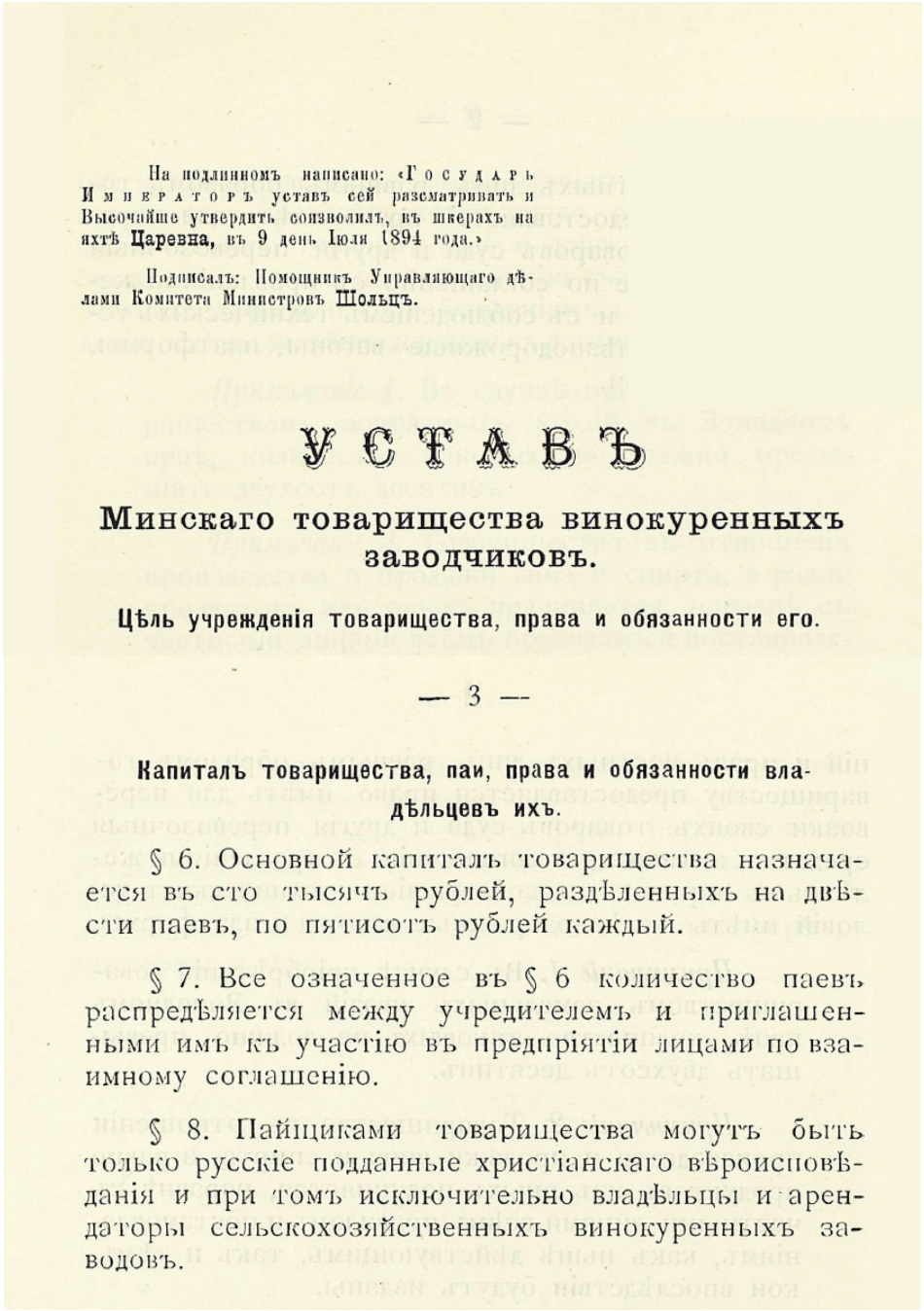
Using the St. Petersburg Stock Exchange data, we find that the capital market did not anticipate anti-Jewish discrimination that followed the shock. In particular, stocks of corporations founded by Jewish entrepreneurs outperformed the market before 1890 and underperformed after. Consistently with the argument that the tsarist government sought to limit influx of capital into certain industries, we find that anti-Jewish restrictions were more likely in more capital-intensive industries, as well as the industries with a special fiscal regime (production of wine, tobacco, and sugar). In addition, to define the pool of potential market entrants, we assemble novel datasets on members of major merchant guilds in 1890. We do not find evidence that Jewish entrepreneurs were overall less likely to incorporate after 1890. Finally, we do not find support for the hypothesis that anti-Jewish discrimination was driven by the differences in factory productivity between Jewish and non-Jewish entrepreneurs.

2.A Appendix: Descriptive information and summary statistics

Table 2.7: Main government's interventions on the domestic capital market, 1883–1901

Year	Operation	Value, millions of rubles	Interest decreased?
1883	Purchase of Tambov-Saratov Railway	7.5	Yes
1885	Purchase of Putilov Railway	1.0	Yes
1885	Purchase of Murom Railway	0.9	Yes
1887	Purchase of Ural Railway	14.5	No
1888	Purchase of Riazhsk-Morshansk Railway	3.5	Yes
1889	Purchase of Transcaucasia Railway	8.5	No
1889	Purchase of Riazhsk-Viazemsk and Morshansk-Syzran Railways	6.2	Yes
1890	Purchase of Tambov-Kozlov Railway	3.5	Yes
1891	Conversion of domestic sovereign debt	70.0	Yes
1891	Conversion of domestic sovereign debt	194.0	Yes
1891	Conversion of domestic sovereign debt	190.0	Yes
1891	Purchase of Kursk-Kharkov-Azov Railway	7.8	Yes
1891	Purchase of Libava-Romny Railway	4.6	Yes
1892	Purchase of Oryol-Griazi Railway	11.6	Yes
1892	Purchase of Orenburg Railway	10.1	Yes
1893	Purchase of Donetsk Railway	6.9	Yes
1894	Conversion of domestic sovereign debt	1120.0	Yes
1894	Purchase of Riga-Dvinsk Railway	9.5	Yes
1894	Purchase of Oryol-Vitebsk Railway	11.4	Yes
1894	Purchase of Russian Railroad Co. (RRC)	113.6	Yes
1894	Purchase of Riga-Mitava Railway	1.4	Yes
1894	Purchase of Dvinsk-Vitebsk Railway	19.1	Yes
1895	Purchase of Moscow-Kursk Railway	54.8	Yes
1895	Purchase of Lozovo-Sevastopol Railway	1.7	Yes
1896	Purchase of Warsaw-Terespol Railway	8.4	Yes
1896	Purchase of Moscow-Brest Railway	11.7	Yes
1896	Conversion of domestic sovereign debt	97.3	Yes
1897	Purchase of Baltiiskaia Railway	24.3	Yes
1897	Purchase of Privislinskaia Railway	7.6	Yes
1897	Purchase of RRC bonds	31.1	Yes
1898	Purchase of Iugo-Zapadnye Railway	50.8	Yes
1898	Conversion of domestic sovereign debt	2.7	Yes
1901	Purchase of Ivangorod-Dombrova Railway	10.0	Yes

Notes:
This table displays the major activities of the Ministry of Finance and the Committee of Ministers on the domestic securities market between 1883 and 1902. Purchases of railway lines and bonds of railroad companies refer to forceful purchases of these lines and bonds using cash or government-issued bonds. The ruble values in column (3) are expressed in nominal terms for the indicated date. Column (4) indicates whether government-issued bonds used in the respective operation offered a lower rate of return to the holders of the assets being replaced. Payments in cash are coded as lower-interest bonds. Source: compiled by authors using Ministerstvo Finansov (1902), Kislinskii (1902), and Migulin (1903). See Appendix for the full references.



На подлинномъ написано: «Государь Императоръ уставъ сей разсматривать и Высочайше утвердить соизволилъ, въ шкерахъ на яхтѣ **Царевна,** въ 9 день Іюля 1894 года.»

Подписалъ: Помощникъ Управляющаго дѣлами Комитета Министровъ **Шольцъ.**

УСТАВЪ

Минскаго товарищества винокуренныхъ заводчиковъ.

Цѣль учрежденія товарищества, права и обязанности его.

— 3 —

Капиталъ товарищества, паи, права и обязанности владѣльцевъ ихъ.

§ 6. Основной капиталъ товарищества назначается въ сто тысячъ рублей, раздѣленныхъ на двѣсти паевъ, по пятисотъ рублей каждый.

§ 7. Все означенное въ § 6 количество паевъ распредѣляется между учредителемъ и приглашенными имъ къ участію въ предпріятіи лицами по взаимному соглашенію.

§ 8. Пайщиками товарищества могутъ быть только русскіе подданные христіанскаго вѣроисповѣданія и при томъ исключительно владѣльцы и арендаторы сельскохозяйственныхъ винокуренныхъ заводовъ.

Figure 2.6: Example of a charter: Minsk Distilling Co. (1894). Source of the image: the Russian State Library website (http://www.rsl.ru). The preamble on the top image says, "Emperor reviewed and approved this charter on the *Tsarevna* yacht on July 9th, 1894." According to Section 8 of the charter (bottom image), "Only Russian subjects of the Christian faith who are the owners and leasers of the distilling factories can be shareholders of this corporation."

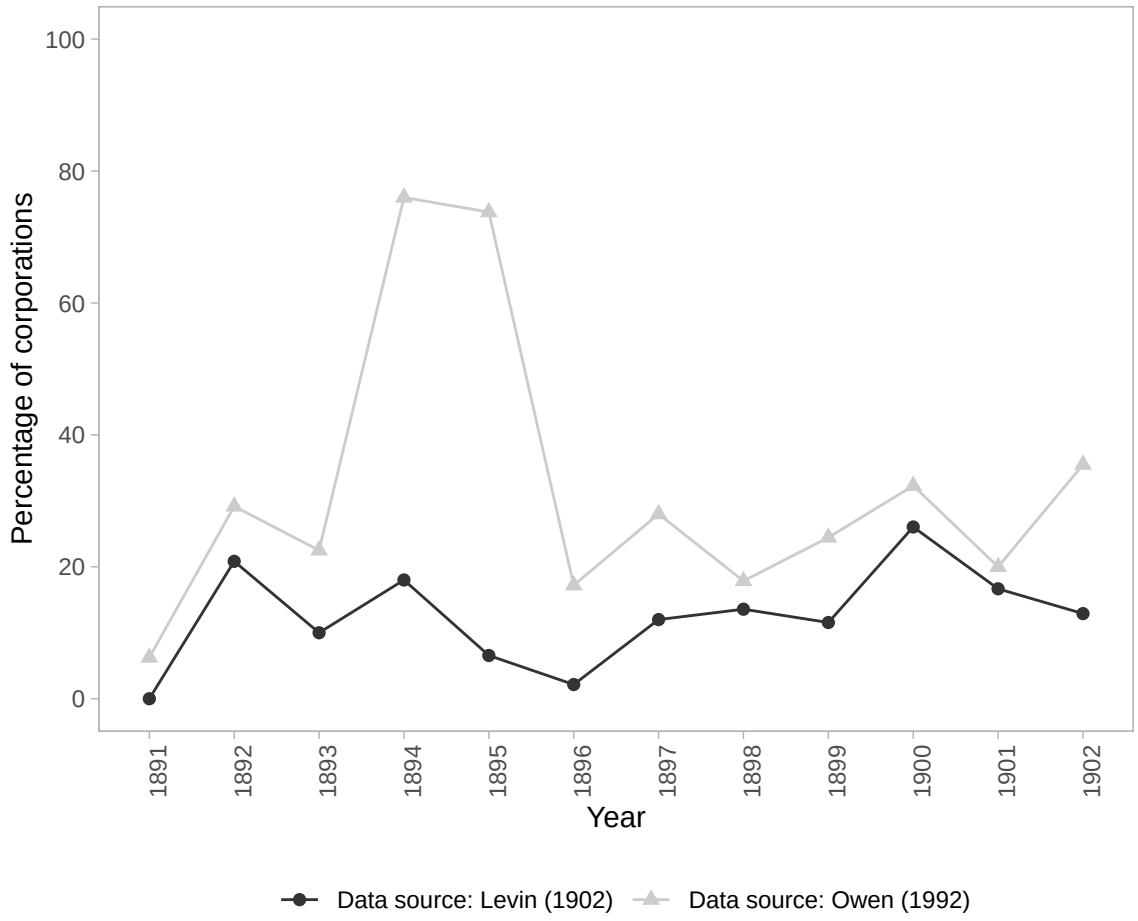


Figure 2.7: Capital restrictions against Jews (all incorporations)

Table 2.8: Summary statistics: Manufacturing corporations (new charters), 1891–1902

Statistic	N	Mean	St. Dev.	Min	Max
Capital restrictions against Jews (Owen)	936	0.30	0.46	0	1
Capital restrictions against Jews (Levin)	936	0.13	0.33	0	1
Industry with an excise tax	936	0.23	0.42	0	1
Inside the Pale	936	0.43	0.50	0	1
Joint-stock company	936	0.68	0.47	0	1
New enterprise	936	0.29	0.45	0	1
Basic capital, ths of 1913 rubles	936	1,464.59	2,333.10	124.53	27,742.75
Foreign founder	936	0.18	0.38	0	1
High-status founder	936	0.23	0.42	0	1
Jewish founder	936	0.18	0.39	0	1
Founder banker (matched founders only)	910	0.04	0.18	0.00	1.00

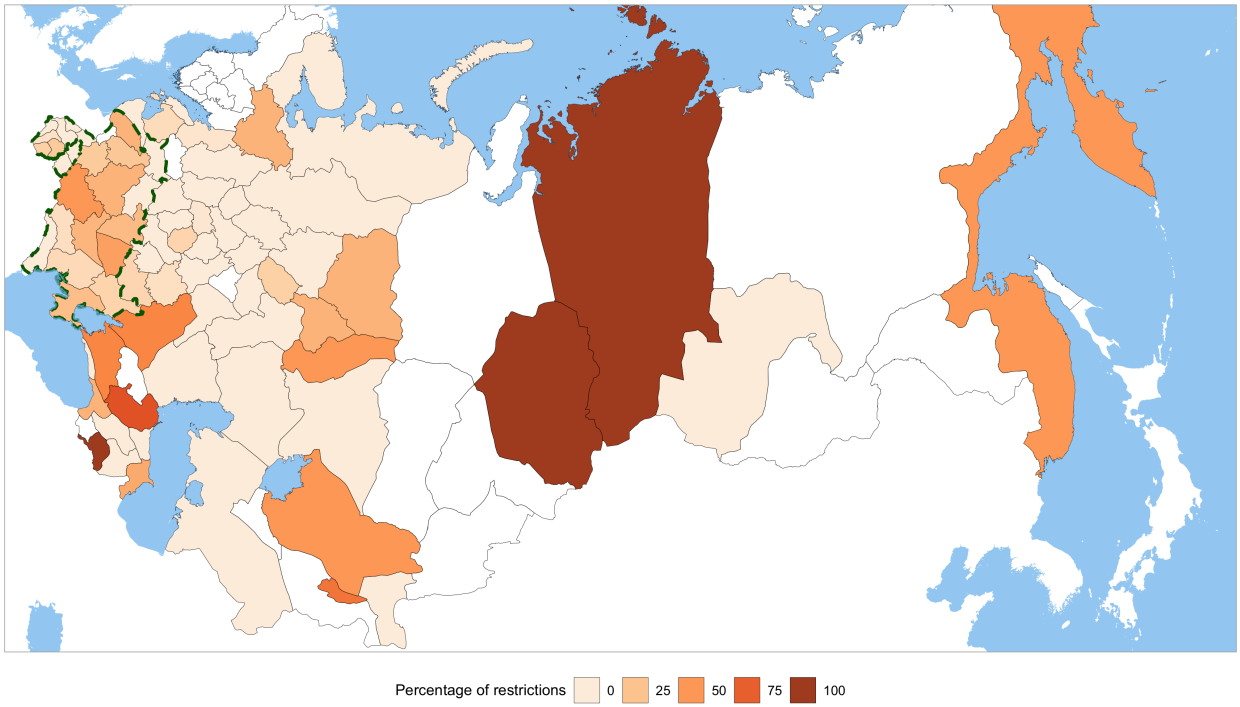


Figure 2.8: Capital restrictions against Jews by province in 1891–1902. Source of the incorporations data: Owen (1992). Source of the restrictions data: Levin (1902). The white color indicates zero incorporations during 1891–1902. The dashed green line displays the border of the Pale of Jewish Settlement.

Table 2.9: Summary statistics: Incorporated factories

Statistic	N	Mean	Median	St. Dev.	Min	Max
Revenue, ths of 1913 rub	457	1,646.93	740.74	2,564.41	2.68	20,148.15
Number of workers	457	661.63	342	1,265.64	2	17,252
Presence of a steam engine	457	0.89	1	0.31	0	1
Horsepower	457	255.26	91	673.26	0	6,952
Revenue per worker	457	4.29	1.94	16.28	0.09	325.93
Horsepower per worker	457	0.40	0.26	0.49	0.00	3.40
Jewish founder	410	1.14	1.00	0.35	1.00	2.00
Foreign founder	410	1.39	1.00	0.49	1.00	2.00
Joint-stock company	410	1.20	1.00	0.40	1.00	2.00
High-status founder	410	1.26	1.00	0.44	1.00	2.00

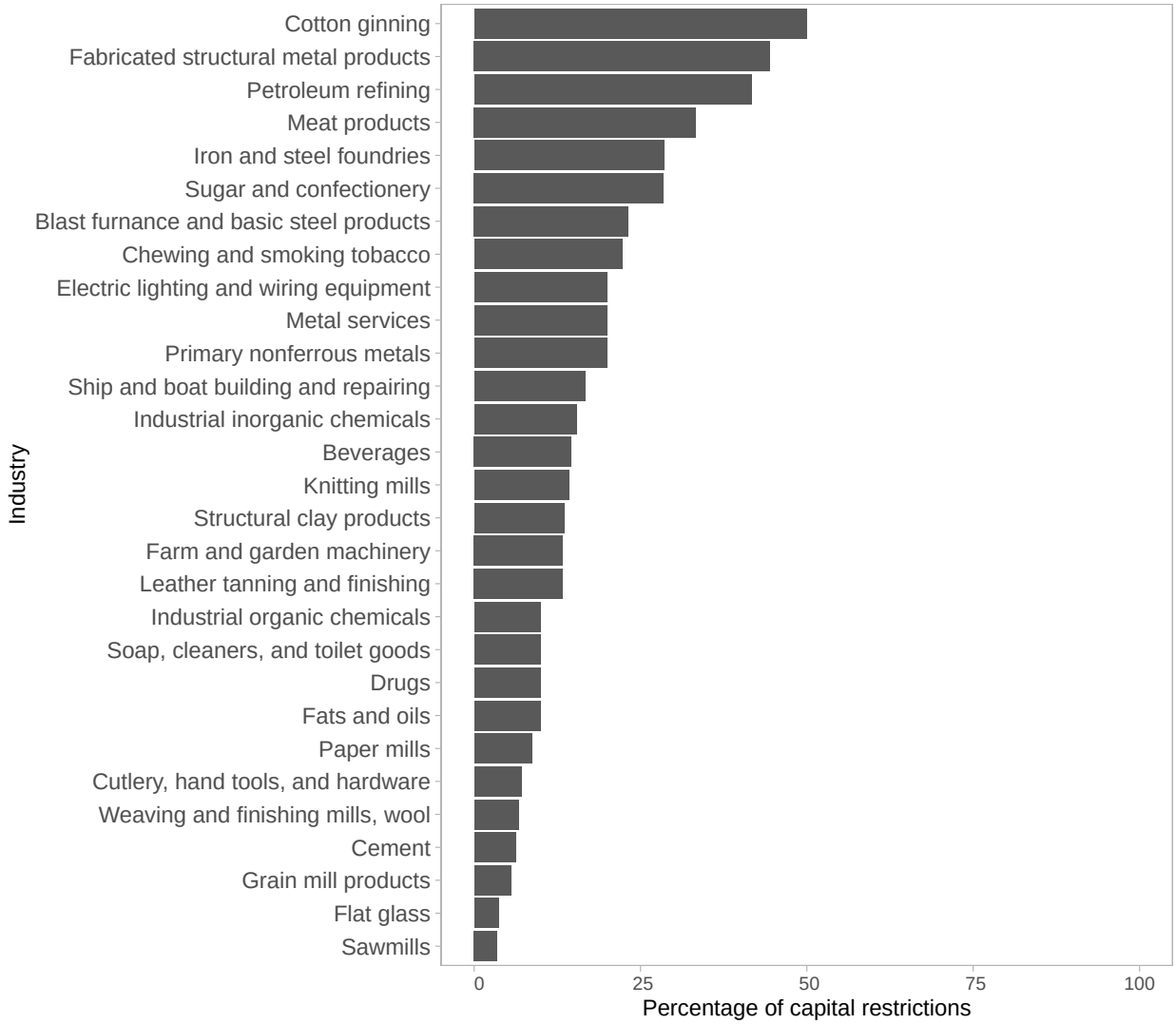


Figure 2.9: Capital restrictions against Jews by industry (percentage of corporations with discriminatory clauses in charters)

Table 2.10: Summary statistics: Industries

Statistic	N	Mean	Median	St. Dev.	Min	Max
Number of factories	73	235.67	46	588.16	1	3,799
Total output, ths of 1913 rub	73	22,525.47	4,122.11	52,903.56	48.89	285,243.60
Number of workers, total	73	11,562.84	2,585	25,465.17	32	157,433
Horsepower, total	73	3,386.14	382	9,020.76	0	57,335
Capital intensity (horsepower per worker)	73	0.28	0.15	0.37	0.00	2.06

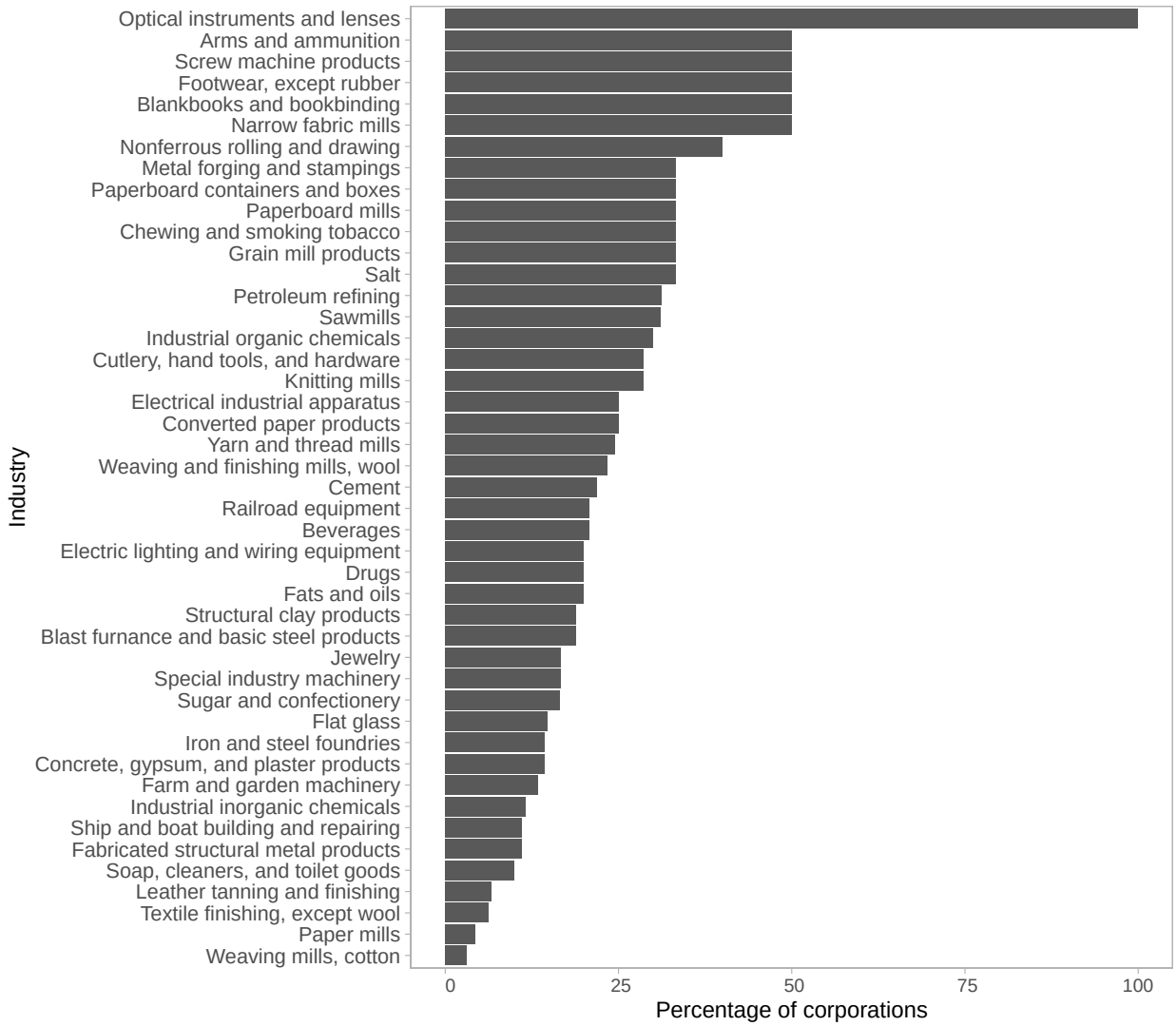


Figure 2.10: Jewish founders by industry (percentage of corporations with at least one Jewish founder)

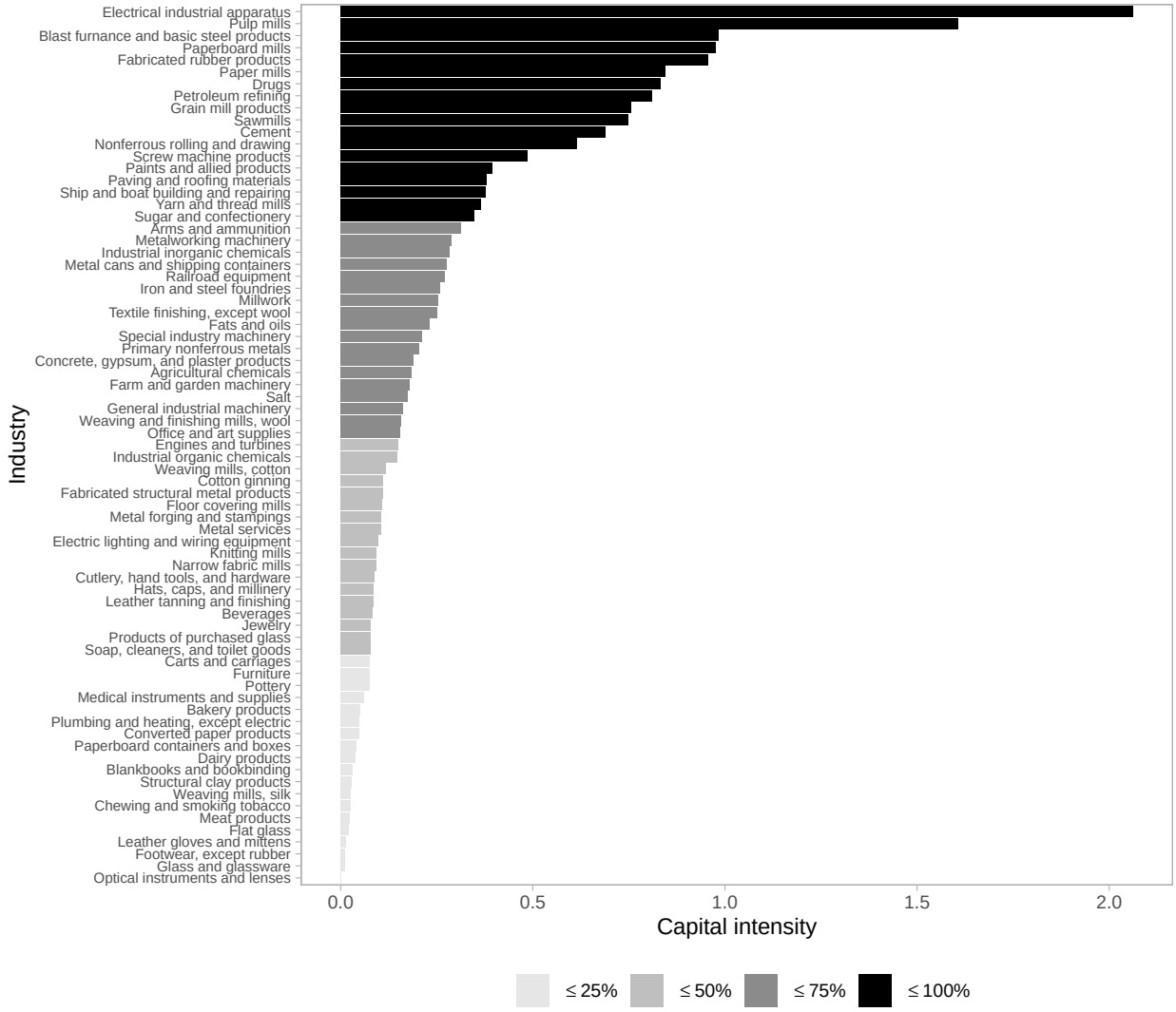


Figure 2.11: Capital intensity by industry (horsepower per worker, grouped by quartiles)

2.B Appendix: Data sources

2.B.1 Government policy (official and unofficial historiography)

Ministerstvo Finansov. 1802–1902. Chast' vtoraia [Ministry of Finance. 1802–1902. Part 2]. St. Petersburg: Ekspeditsiia zagotovleniia gosudarstvennykh bumag, 1902. Official publication of the Ministry of Finance of the Russian Empire.

Kislinskii, N. A. (1902). *Nasha noveishaia zheleznodorozhnaia politika po dokumentam arkhiva Komiteta Ministrov. Tom 3 [Our railroad policy, based on the archives of the Committee of Ministers. Vol. 3].* St. Petersburg: Gosudarstvennaia tipografiia. Official publication of the Committee of Ministers of the Russian Empire.

Migulin, P. P. (1903). *Nasha noveishaia zheleznodorozhnaia politika i zheleznodorozhnye zaimy (1893–1902) [Our recent railroad policy and railroad bonds].* Kharkov: Tipo-litografiia "Pechatnoe Delo."

2.B.2 Corporations

Owen, Thomas C. (1992). *RUSCORP: A Database of Corporations in the Russian Empire, 1700–1914. 3d release.* Ann Arbor, MI: Inter-University Consortium for Political and Social Research.

2.B.3 Anti-Jewish restrictions, 1891–1902

Levin, E. B. (1902). *Sbornik ogranichitel'nykh zakonov i postanovlenii o evreiakh po 1-e iiulia 1902 goda [A Collection of Restrictive Laws and Decrees on the Jews as of July 1, 1902].* St. Petersburg: Tipografiia M. M. Stasiulevicha.

2.B.4 Factories in 1890 (Russia)

Orlov, Petr Aleksandrovich (1894). *Ukazatel' fabrik i zavodov Evropeiiskoi Rossii [A Directory of Factories in European Russia].* St. Petersburg: Tipografiia V. Kirshbauma.

2.B.5 Industries in 1890 (United States)

Department on the Interior, Census Office (1895). *Report on Manufacturing Industries in the United States at the Eleventh Census: 1890. Part I. Totals for States and Industries.* Washington, D.C.: Government Printing Office. Official publication.

2.B.6 Merchant guilds in 1890

Adresnaia kniga odesskikh 1 i 2 gil'dii kuptsov. 1890–1891 [A Directory of Merchants of the First and Second Guild in Odessa. 1890–1891]. Odessa, 1890.

Spravochnaia kniga o litsakh, poluchivshikh na 1890 g. kupecheskie svidetel'stva po 1 i 2 gil'diiam v Moskve [A Directory of Individuals Who Obtained a Merchant Certificate of the First and Second Guild in Moscow as of 1890]. Moscow: Tipografiia A. G. Kol'chugina, 1890.

Spravochnaia kniga o litsakh sankt-peterburgskogo kupechestva i drugikh zvanii, poluchivshikh v techenie vremeni s 1 noiiabria 1889 po 1 fevralia 1890 g. svidetel'stva i bilety po 1 i 2 gil'diiam na pravo torgovli i promyslov [A Directory of St. Petersburg Merchants and Other Individuals Who Obtained a Merchant Certificate of the First and Second Guild Between November 1, 1889 and February 1, 1890]. St. Petersburg: Gosudarstvennaia tipografiia, 1890.

CHAPTER 3

Establishing a Parliament from Scratch: Electoral Manipulation in Imperial Russia

3.1 Introduction

Manipulating electoral rules and undermining democratic institutions has been a hallmark of the Russian authorities. Recent studies show that the current regime in Russia engages in electoral fraud, voter intimidation, vote buying, and manipulation of electoral rules (Enikolopov et al., 2013; Frye et al., 2014, 2017, 2018; Harvey, 2016; Rundlett and Svolik, 2016; Simpser, 2013; Forrat, 2018; Szakonyi, 2019). Perhaps surprisingly, many of these practices date back to the introduction of the institution of elected parliament in Imperial Russia in the early 1900s. What were the electoral manipulation strategies of the tsarist regime back then? I argue that the regime relied on the power of landed elites, industrialists, and state employees to manipulate turnout and deliver votes in parliamentary elections. With the help of the elites, the regime used electoral coercion and repression to intimidate peasants, workers, and urban residents to show up or abstain, depending on perceived loyalty of their respective class.

After a series of worker strikes and peasant uprisings in 1905, Tsar Nicolas II announced the creation of a new national institution of elected parliament, the State Duma. All future laws would require the approval of the newly established parliament. After the local governance reform of 1864, elected assemblies responsible for local public goods provision were created in the majority of Russia's regions (Castañeda Dower and Markevich (2018)). To be sure, the tsarist regime put in place multiple constraints to control candidate selection and election, ranging from the restricted suffrage to the multi-stage electoral system. The electoral system

designed in 1906 explicitly favoured wealthy landed elites and entrepreneurs over eligible peasants and factory workers who were formally granted voting rights. The suffrage was restricted and male-only: in 1907 around 3 percent of the population in the regions and large cities of European Russia were eligible to vote (Ministry of Internal Affairs (1911), p. VI). The indirect electoral system established in Imperial Russia in 1906 was similar to the system that existed in Prussia at that time (Ziblatt (2008), Mares (2015)): voters were split into separate groups based on their professional occupation, property ownership, and the taxes they paid; at the first stage, eligible voters voted for electors. At the second stage, electors voted to elect legislators into the parliament. Parliamentary elections in Imperial Russia were supposed to be held every five years, yet, only one parliament (the third State Duma) managed to complete its full term. The tsar dismissed the first two parliaments. Despite being explicitly favoured by the tsarist regime at various election stages, pro-tsarist conservative parties could never get a majority in the parliament.

In this paper, I focus on the electoral process in 1907 for the third parliament, the only one that existed for its full term. Using newly digitized data from archival sources at a local level with detailed statistics on groups of voters, I investigate the empirical relationship between land inequality, employment concentration, the percentage of state employees and the 1907 electoral results in Russia's districts such as turnout, the percentage of elected conservative electors, and the percentage of failed elections. I find that land inequality is positively associated with the turnout of peasants, which indicates the power of landowners in rural areas. Interestingly, unlike turnout rates in other voter groups, the peasant turnout rate was always at least 20 percent. At the same time, higher employment concentration, which indicates the power of industrialists, does not appear to affect the turnout of workers directly. However, higher employment concentration is negatively associated with the percentage of failed elections at factories. Finally, the share of state employees is positively associated with urban voter turnout, which could be indicative of electoral pressure on the state employees by the tsarist regime.

In terms of ideology of the elected representatives, I find that capacity for electoral manipulation by the industrial elites, proxied by high levels of employment concentration

at the factories in cities, resulted in a higher percentage of pro-tsarist conservative electors elected in urban elections. However, urban voters were more likely to elect more liberal (leftist) electors compared to other voter groups.

This paper is most closely related to the studies of elections in Prussia prior to 1914 by Ziblatt (2008) and Mares (2015). I have digitized the novel local-level electoral data on the elections into the third parliament which has not been systematically studied before. Solovyev (2019) provides descriptive details about the third and fourth parliaments but does not document statistical relationships. The electoral system established in Russia in 1905 was mostly similar to the system that existed in Prussia in the 19th century. I study land inequality and employment concentration that I was able to measure at the district level. The analysis in Mares (2015) is focused on electoral fraud measured as the number of electoral irregularities that local electoral commissions reported to the Reichstag between 1870 and 1912. In this paper, I study electoral outcomes in 1907 rather than reported electoral irregularities since there is a possibility for substantial selection bias in reporting. I complement the analyses of electoral outcomes at the district level with the region-level data on electoral irregularities in 1907. I show that there is heterogeneity in how electoral irregularities are reported, which depends on the stage of elections at which a complaint is filed.

This paper proceeds as follows. Section 3.2 provides more details about the historical context, as well as the archival evidence of electoral manipulation. Section 3.3 discusses possible mechanisms of electoral manipulation in a historical context of Imperial Russia. Section 3.4 describes the novel district-level dataset that I compiled from multiple archival sources. Section 3.5 outlines my empirical strategy, which allows me to uncover correlation patterns in the data that are in line with the electoral manipulation mechanisms. Section 3.6 presents the main results and discussion. Section 3.7 concludes.

3.2 Background

3.2.1 Establishing a Parliament in 1905

The Manifesto issued by Tsar Nicolas II on August 6, 1905 drafted a plan to establish a new legislative institution of elected parliament, the State Duma (the lower house).[1] According to the initial plan, the State Duma did not have actual legislative power: its role was to develop and discuss legislation. The Manifesto signed by the tsar on October 17, 1905, after a series of worker strikes and peasant uprisings, solidified the new institution and selectively extended the franchise to peasants and workers. All laws required the approval of the newly established parliament, with the first election to take place in 1906. The tsar, however, had an absolute veto power to block the passage of legislation and could dissolve the State Duma at any time (Solovyev, 2019).

The institution of parliament was not established completely from scratch: local — district and provincial-level — elected institutions existed in Imperial Russia since the local governance reform passed by Tsar Alexander II in 1864. This reform allowed local elites to retain power over the political and economic agenda in their district after the abolition of serfdom in 1860. The eligible population was split into three main groups (*curiae*) by their profession and property ownership: rural landowners, urban residents, and peasants (Castañeda Dower et al. (2018)). Each group elected representatives into the local assembly at the district level and into the regional assembly (*Ibid.*). By the 1883–86, local elections were held in 34 regions (*guberniya*) and 353 districts (*uezd*) of European Russia. Despite the existence of local institutions, the tsarist government had waited for almost fifty years to introduce the national elected legislature.

Since the establishment of the parliament in 1906, there were four convocations until the revolution in 1917:[2]

[1] In the upper house of the parliament, the State Council, one-half of the members was directly appointed by the tsar.

[2] Source: The History of the State Duma, duma.gov.ru/en/duma/about/history/information, last accessed on March 23, 2020.

- First parliament: April 27 – July 9, 1906 (dismissed by the tsar)
- Second parliament: February 20 – June 3, 1907 (dismissed by the tsar)
- Third parliament: November 1, 1907 – June 9, 1912 (the only parliament that worked full term)
- Fourth parliament: November 15, 1912 – October 6, 1917 (dismissed by the decree of the Provisional Government during the 1917 revolution)

Electoral institutions were created so that elites could control elections from the very first step. The electoral process was two-step and classified voters into four different groups (see Figure 3.1). In 1907, only 3.3% of the population in 49 regions (484 districts) of European Russia and the Don Army Territory, as well as five large cities of European Russia had voting rights (Ministry of Internal Affairs (1911), p. VI). To be eligible to vote a person had to be male, over 25 years old (students were excluded), with no prior convictions. At the district-level (*uezd*), voters were split into several groups depending on their professional and property-ownership qualifications: peasants (rural residents), factory workers, landowners, and urban residents.

Urban residents included house and apartment owners, factory and firm owners, as well as various taxpayers (entrepreneurs who paid taxes, e.g. merchants, building residents paying apartment taxes), active and retired state employees. In the 1907 election urban voters were split into two separate groups where the first group included the richest urban residents (City I), while other residents who were eligible to vote were automatically included into the second group (City II). Owners of property in the City I group constituted up to 77.7 percent of all eligible voters on average, and up to 39.7 percent among the City II voters. Another large group of eligible urban voters were firm and factory owners, up to 23.2 on average in the City I group and 15.8 on average in the City II group. In the City II group, an important category of voters were state employees, 27.7 on average.

Eligible landowners were also split into the richest ones and everyone else. This was done to avoid giving too much power over the electoral results to the large population of

relatively poorer landowners that included land-owning peasants. Therefore, elections from the landowners were held in two stages (in addition to the overall two-step system for four classes, see Figure 3.1). First, poorer landowners elected representatives at the so-called preliminary elections (*preds'ezd*), and then elections for landowners were held where rich landowners elected electoral representatives together with the representatives from the poorer landowners. Owners of smaller landholdings who had to vote in a preliminary election included rectors of Orthodox churches.

With the assignment of all voters into four groups it was almost impossible to verify that the same person was not included into different lists at the same time, which essentially allowed this person to vote in several elections. For example, a landowner owning a factory in a city could be eligible to vote both as a landowner and as an urban resident.

Classification into separate eligible groups of voters was just one method of ensuring the power of wealthy elites. In addition to that, at the first step, eligible voters from different groups in each municipal district (*uezd*) could vote for the so-called electoral representatives or electors. At the second step, all electors elected by different groups (peasants, workers, landowners, and urban residents) at the uezd level assembled at the region level to elect members of the parliament. A region (*guberniya*) was equivalent to an electoral district.

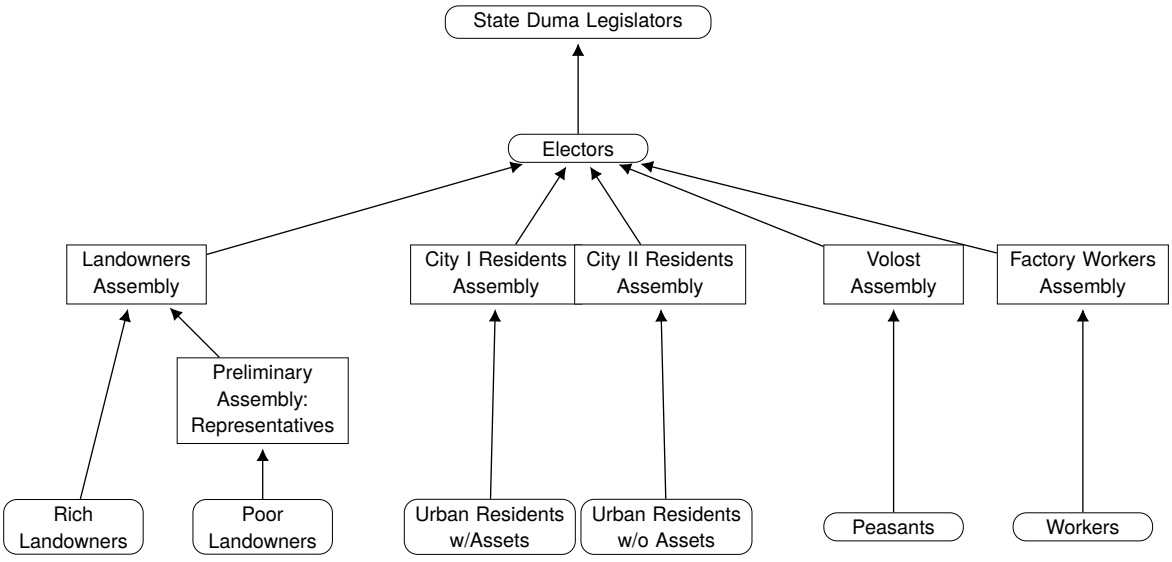


Figure 3.1: Electoral process in 1907: the third State Duma

3.2.2 Electoral process

The election into the third Duma was held in September–October 1907, and the new parliament started its work on November 1st 1907. The lists of eligible voters had to be compiled and made public four weeks prior to the election (Moscow City Council (1908)). The detailed archival information about the electoral process at the district level is very scarce. In this section, I present qualitative evidence about the parliamentary election in Moscow. Moscow was one of the five big cities in 1907 that held a separate election.

The new electoral procedure in 1907 split urban voters into two sub-groups, based on their property ownership or income. Eligible urban voters who were already registered at each of the seventeen polling stations in Moscow had to be re-classified. The first group of voters (City I) included urban residents who owned property estimated (for tax reasons) at more than 3,000 rubles, as well as entrepreneurs who owned factories or were involved in shipping or trade business and paid over 500 rubles in taxes (*Ibid.*, pp. 5-6). The second group of voters (City II) included urban residents who owned property estimated at less than 3,000 rubles or who were involved in entrepreneurial activity and paid less than 500 rubles in taxes. The lists of eligible voters were compiled in cooperation with the board of Moscow merchants, the Moscow Finance Chamber, and firms and factories that provided information about their employees. In addition, pensioners and building tenants who paid less than 300 rubles per year could show up to the city council and bring proof of their eligibility (pension paid, rental agreements). Relatives of urban residents who owned property (parents, spouses) could also vote on their behalf.

What if a voter was eligible to vote as a member of several voting groups? The electoral law suggested that in such cases eligible voters could choose their main qualification and a polling station where they wanted to vote (*Ibid.*, p. 10). Since notifying the city council about eligibility was at the discretion of voters, double counting of eligible voters was acknowledged by local authorities. In districts other than Moscow city, workers and landowners could be eligible to vote as urban voters. In Moscow, the statistics department of the city council had a rule how to classify urban voters if they were included into both City I and City II lists

(and did not state any preference about their qualification). For example, the preference was given to the City II qualification if a voter was paying taxes for property over 3,000 rubles (City I) and owned a factory or a firm that paid less than 500 rubles in taxes (City II). The final lists of eligible voters were printed in the city council newspapers (*Ibid.*, p. 31).

Interestingly, in cases where employees of a trade firm or at a factory did not provide an address, they would be assigned to vote at a polling station where this firm/factory was located (*Ibid.*, p. 13). As I argue in Chapter 1, this could be a channel for the workplace electoral intimidation.

The available information about individual voters is very scarce. Final lists of voters did not contain information about their age, religion, or education (Ministry of Internal Affairs (1911), p. VI). Voters were not required to provide their addresses (Moscow City Council (1908), p. 17). Typical lists of urban voters that were published for selected cities prior to the 1912 parliamentary election into the fourth State Duma include voters' names, their profession, and in some cases a type of property that they own. However, to the best of my knowledge, neither complete individual nor district-level archival data with electoral results are available for the 1912 election.

Lists of eligible voters could be manipulated. In Orenburg, the police organised a scheme when urban residents without property could apply for property ownership and the confirmation of their application was enough as a proof of their eligibility to vote (Krol' (1906), p. 13).

Was voting secret? On election day voters had to bring a specific license (*vkhodnoi bilet*) with them, to verify their identity, which was basically a ticket that granted access to the polling station (Moscow City Council (1908)). This ticket was stamped. Voters received invitations to vote by mail, together with an empty voting ballot. In Moscow, voters were recommended to fill in the candidate names at home to ensure the secrecy of votes. Voters could also receive their ballots at the polling station. After a voter's identity was verified, he handed over their folded ballots that were immediately put into the ballot box. This approach can be contrasted to the first stage voting in Prussia, where voting for electors was

done by the show of hands of the voters who were present (Becker and Hornung (2019)).

3.2.3 First political parties

The establishment of Parliament in Imperial Russia has led to the emergence and institutionalization of the first parties. Among the first parties were:

- the Constitution-Democratic party (*kadets*);
- the Union of October 17th (*oktyabrists*);
- the Union of Russian People (*URP*) created in 1905 and existed up until 1908;
- the Social Revolutionaries (*SR*);
- the Russian Monarchist Party (*RMP*).

According to Solovyev (2019), by 1917 only 0.5% of the population in Imperial Russia had a party affiliation, which is not surprising given that only about 3% of population were eligible to vote. Interestingly, there was no majority party or coalition in all the four parliaments despite all the attempts of the tsarist regime to adjust the electoral rules and monitor the electoral process.

The key question is which parties can be considered conservative. In the archival data that I digitized, conservative legislators were coded as those who identified with the right parties and affiliated fractions, the national group and the fraction of moderate-right party (Ministry of Internal Affairs (1911), p. XXXV). Gilbert (2016) argues that at the time in Imperial Russia conservatives and rightists were not the same concepts. Right-wing ideas were related to preserving tsarist autocracy, but among the right parties there was substantial heterogeneity in how they approached preserving the autocracy. For example, the *Union of Russian People* was a conservative organization that included members with heterogeneous background, e.g. small landowners and peasants. This party did not want to place any restrictions on the tsar's power.

According to Solovyev (2019), the Constitution-Democratic party (*kadets*) targeted primarily urban voters. *Kadets* were formally pro-tsarist party, but they can be considered moderate conservatives. They lobbied for a land reform, with land nationalization, and demanded the right for workers to protest and have an eight-hour working day. In Ministry of Internal Affairs (1911), *kadets* were also coded as conservatives.

The Union of October 17th (*oktyabrists*) had industrialists as leaders. Solovyev (2019) argues that the *oktyabrists* won elections into the third and fourth parliaments from regions where local elected institutions (*zemstvo*) were well established by 1907. This party was against land nationalization and cooperated with Pyotr Stolypin in the third parliament. In Ministry of Internal Affairs (1911), the legislators who identified as *oktyabrists* were coded as moderates.

The remaining parties and coalitions in Ministry of Internal Affairs (1911) were coded as leftist (ethnic minority parties such as Polish-Lithuanian and the Polish Kolo groups, the Muslim group, as well as the group of the Russian progressives and *Mirnoobnovlentsy*, the Labor Group (*trudoviki*) and the affiliated Social Revolutionaries, the constitution-democratic fraction, and the affiliated with it social-democratic fraction) (*Ibid.*, p. XXXV).

In the data that I digitized I observe the overall number of electors classified as leftist, moderate, or conservative, as reported by the Ministry of Internal Affairs in 1911. In the 1907 elections, 37% of legislators elected into the Third Duma were from the conservative parties and 25% were from the leftist parties, the rest identified as moderates (Ministry of Internal Affairs (1911), p. XXXV).

3.2.4 Electoral repression

There is plenty of evidence of electoral repression and intimidation. Historical records demonstrate that the elites tried to manipulate turnout of non-elite voters in the parliamentary elections.

Prior to the 1906 election into the second parliament, after the first parliament was dismissed by the tsar, local officials and the police received specific instructions on how to

approach the upcoming election (Krol' (1906), pp. 6-7). Local officials were instructed to hold 'prophylactic' discussions with peasants to make sure they understand that their turnout is not simply their right, but their responsibility, and that they should not support opposition parties. Local officials were also supposed to monitor the situation at the polling stations with the help of intermediaries, to make sure that the most vocal opposition activists do not access polling stations during the election of electors, otherwise, they could be forcibly removed. Polling stations were supposed to have lists of individuals who could not be candidates for the election of electors because of their 'unreliability'. If unreliable candidates were elected, the officials could claim that the election 'failed' (*Ibid*, pp. 8-9).

In the Gadiach uezd of the Poltava region, local authorities tried to actively recruit peasants into the pro-tsarist party, they threatened to go after anyone who joined other parties that they labeled 'revolutionist'. All literate peasants were closely monitored in Kursk, and the police seized all political leaflets and prevented any meetings of more than 5-6 people (*Ibid*, p. 8). The result was that electoral repression was so severe that the police and local officials started to worry about voter absenteeism (*Ibid*, p. 8). The jail in Nezhin city was full: the police arrested twice the number of people that the jail could hold (*Ibid*, p. 9). All these examples of electoral repressions were reported by local newspapers at the time.

Not just individuals, but parties were also targeted. They could not print and disseminate their leaflets and programs, or hold meetings. In the city of Summ, all teachers were required to sign petitions that they were not going to join any parties more leftist that the *Union of the October 17th*. Nominations of candidates for electoral representatives were controlled, in some cases, it was openly announced that voters could only select candidates among themselves on the election day. They could not nominate any "unreliable" candidates; sometimes peasants were scared to nominate anyone, because candidates could end up in jail (*Ibid*, p. 12).

What about electoral repression of workers? In the city of Rybinsk, at the railroad workshops and mills where owners controlled and carefully crafted the lists of workers who were eligible to vote. The owners dismissed (and even arrested with the help of the police) any activists or unreliable workers, especially if they had chances to be selected as candidates for electoral representatives (*Ibid*, p. 14).

Solovyev (2019) mentions a case of electoral repression during the 1912 election into the fourth parliament that took place in Nizny Novgorod, a city located roughly 300 miles from Moscow. The governor ordered the bridges over the Oka river to be lifted the day before the election and made sure that all boats were occupied on the day of the election, so that the electors from workers who lived across the Oka river in a poorer part of the city could not get to the electoral assembly.

3.3 Electoral manipulation: the role of elites

The unequal distribution of land was a key factor in the context of the first parliamentary elections. Chernina et al. (2014) notes that land inequality was one of the main factors that led to the 1905 revolution in the tsarist Russia. In this paper, I study how wealthy elites could control the voting behaviour of the eligible voters that depended on them. Historically, landowners had political and economic power over workers and peasants who resided on their property (Baland and Robinson, 2008, p. 1738). Landed elites are also considered to be one of the key players who had incentives to prevent democratic reforms (Ziblatt (2008), Boix (2003)). Following Boix (2003), Ansell and Samuels (2010) makes a distinction between income inequality and land inequality, arguing that high income inequality makes democratic reforms more likely, while high land inequality prevents the reforms. High land inequality is a proxy for the political control of landowners.

Baland and Robinson (2008) suggests that in 19th-century Britain and Germany, as well as in the 20th-century Latin America, even without an open ballot, landlords could find ways to monitor turnout of their workers and tenants and infer their voting choices. The ability of landed elites to control voting behaviour of peasants and workers tends to be positively associated with the support for the right-wing parties.

Mares (2015) studies the elections in 19th-century Imperial Germany, and, in turn, distinguishes between inequality in the distribution of land and inequality in agricultural employment conditions. Mares (2015) shows that in Imperial Germany the inequality in land ownership was only weakly correlated with the inequality in agricultural employment.

Landowners may own land, but what matters is how many peasants and workers they can successfully mobilize. This argument is based on an implicit assumption that these dependant peasants were all enfranchised. In this version of the paper, I focus on land inequality.

In the early 1900s, one of the most important questions raised by the first parliaments in the Russian Empire was land reform. Pyotr Stolypin, the Prime Minister of Russia and the Minister of Internal Affairs in 1906–11, introduced the land titling reform after the 1905 revolution. The main idea of the reform was to grant peasants independence from mandatory peasant communes, so that peasants could get personal ownership over a plot of land (Pallot (1999), Chernina et al. (2014)). Using the regional-level data, Castañeda Dower and Markevich (2018) estimate that during the period 1907–15 only about 16 percent total of peasant households privatized their plots (*Ibid.*, p. 2). The land reform was a prominent topic for discussions in the third State Duma elected in 1907 after the first two parliaments were dissolved by the tsar. In this paper, since I study the 1907 election I do not focus on the land reform as such. I include region-level fixed effects in the regression analyses, which should adjust for the differences in the extent to which peasants in different provinces privatized communal land in 1907.[3]

The political system in Imperial Russia weighed the interests of landowners and the gentry over the interests of peasants. However, after the industrialization in the 19th century a new class of entrepreneurs emerged as a political and economic force. Wealthy industrialists owned factories, trade firms, and banks, and they had salaried employees who they could control and mobilize to vote. Does it mean both higher land inequality and higher employment concentration lead to more votes for right-wing parties?

Mares (2015) studies the power of industrialists in pre-1914 Prussia and suggests that electoral intimidation by industrialists should be more successful in localities where (i) employment is concentrated at a small number of firms or factories, e.g. there is a dominant employer or employers, and (ii) outside employment options are limited.

What would be the consequences of electing more right-wing legislators into the parliament?

[3]Chernina et al. (2014) extracts statistics on privatized communal plots from the Ministry of Justice in 1907–1909 at the regional (*guberniya*) level.

Does it mean that they prevent any democratic legislation to be passed? Becker and Hornung (2019) asks whether the three-class male franchise in Prussia in the 19th and early 20th century that over-represented the economic elite, e.g. landowners and large industrialists, favoured these elites in policy making. Interestingly, they find that higher vote inequality was associated with more liberal roll call voting for the policies related to taxation and public good provision. Becker and Hornung (2019) argues that this outcome can be explained by the differences in the motivation of large landowners versus industrialists. Large landowners who resided in rural areas favoured conservative policies, while in urban areas landowners and industrialists can formed a coalition to promote economic activity. The positive relationship between liberal roll call voting and vote inequality that Becker and Hornung (2019) document appears to be driven by localities with a higher share of industrial employment. Therefore, even right-wing legislators do not always block the passage of democratic reforms. This is an important finding since I also focus on the election of right-wing electors, but in this version of the paper I do not study the consequences of electing more conservative electors for policy making outcomes in Imperial Russia. Given that the first two parliaments were dismissed by the tsar, it is likely that electoral manipulation efforts of wealthy elites did not produce desired political outcomes in the early 20th century.

The focus on landed elites and industrialists, however, may be misplaced in the context where state employees had power over all groups of voters at the local level. Mares (2015) provides qualitative and some quantitative evidence of electoral intimidation practiced by state employees, but focuses only on land inequality and employment concentration in the empirical analyses. Following Forrat (2018), in my main regression specifications I control for the percentage of state employment in each district to proxy for the political power of state employees. This proxy, however, does not allow me to distinguish between at least two potential mechanisms at the aggregate district level: (i) eligible voters (peasants, workers, urban residents) might be intimidated by state employees to support conservative electors, (ii) state employees who are eligible voters themselves are intimidated by the tsarist regime to support conservative electors.

How can powerful elites influence electoral outcomes? I expect that districts with higher

employment concentration, land inequality, and the share of state employment should elect more conservative electoral representatives by manipulating turnout to the advantage of local elites. Turnout may be increased or suppressed depending on the underlying motivation of the elites. Imperial Russia is a perfect context to test for heterogeneous motivation of the elites since each class of voters elected their own electoral representatives. I look at the electoral outcomes by separate groups of voters. Rural election outcomes should demonstrate whether large landowners had any political power over peasants, while the outcomes of urban elections and elections held at factories should indicate whether wealthy industrialists could control factory workers and urban residents. Finally, qualitative archival evidence suggests that state employees could affect turnout of all groups of voters (see Section 3.2.4).

This paper studies the electoral process at a local level with restricted suffrage. The fourth and final parliament seized to exist during the 1917 revolution. Castañeda Dower and Markevich (2020) looks at the 1917 election into the Constituent Assembly and suggests that the support for the Bolsheviks was higher in the districts with a higher share of industrial employment and a higher share of private land. This was the first election with universal suffrage. Factory workers who perceived that there was private land to redistribute became core supporters of the Bolshevik regime.

3.4 Data

3.4.1 Electoral data

I digitized the archival data from the Ministry of Internal Affairs that contains detailed information about cross-sectional district-level (uezd-) elections of electoral representatives into the Third Parliament (the 1907 election). Statistical information about parliamentary elections in Imperial Russia is extremely scarce. To the best of my knowledge, this detailed information is only available for the 1907 election.

The 1907 electoral data contains aggregate information about the electoral process for different groups of voters at the district level. One caveat is that there is no person-

specific information about the eligible voters or about the candidates who run for electoral representatives.[4] From the available district-level data, I calculate the following outcomes of interest:

- turnout rates,
- the percentage of conservative (rightist) electors elected in each district, and
- the percentage of failed elections.

The percentage of conservative electors elected in each district is a proxy outcome for the percentage of votes for conservatives which is unavailable as it was not published by the Ministry of Internal Affairs.

Turnout rates in 1907 varied a lot by the types of voters (see Figure 3.2). Interestingly, in rural elections turnout rates of peasants were quite high at the district level, with the median of 70 percent, and varied from 21 to 96 percent. In comparison, the median turnout among factory workers was just 35 percent, however, the lowest turnout was as low as 1 percent. Turnout rates also varied a lot among urban voters: the median turnout rates were around 34 and 28 percent for rich (City I) and poor (City II) urban voters respectively. Turnout in the preliminary elections held for small landowners was quite low, with the median of 13 percent.

Figure 3.3 shows the percentage of conservative (right) electoral representatives by voter groups. If the main aim of electoral manipulation was to increase turnout of certain groups of voters, e.g. peasants, then higher turnout rates should be associated with a higher proportion of conservative electors elected at the first stage.

The original archival source (Ministry of Internal Affairs (1911)) published only the aggregate information about the electoral representatives. The overall percentage of conservative electors elected from all districts was 47% (*Ibid.*, p. XXX) (20% were moderates and 22% were leftists, and 11% did not identify with any party).

[4]In addition, I have information about the distribution of baseline socio-economic characteristics of elected representatives (age, education, profession, religion).

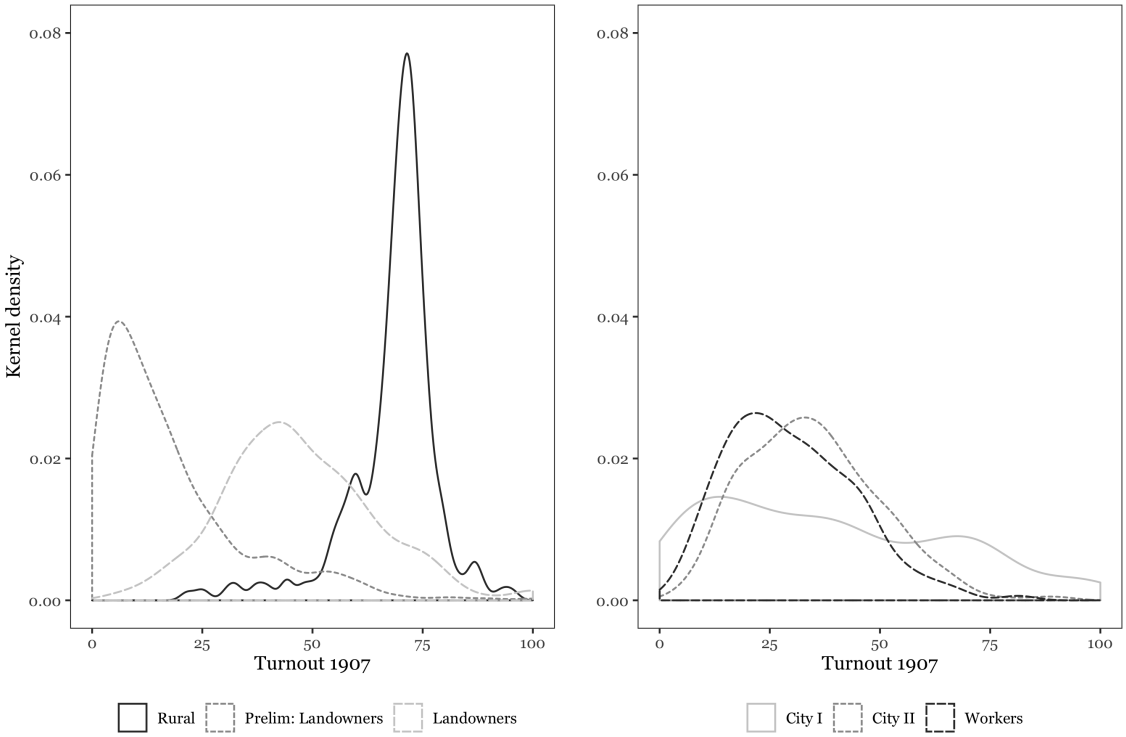


Figure 3.2: Turnout in the 1907 parliamentary election. Kernel density plots by groups of voters. Source: author's calculations based on archival sources.

In addition, I digitized the 1883–86 electoral data for local elected assemblies (*zemstvo*) at the district (*uezd*) level. Electoral outcomes in the local-level elections reflect existing electoral arrangements that were in place by the 1880s. If electoral manipulation was practiced in local level elections in the 1880s, I expect to see higher correlation between turnout rates in local level elections and in the national election in 1907. At the same time, positive correlation in turnout rates in the 1907 election and in the 1883–86 local elections can reflect higher political engagement of different groups of voters. The data on turnout in 1883–86 local elections is only available for 34 out of 49 districts, this is because local level elections were held only in some regions and districts in the 1880s. To the best of my knowledge, there is no comparable uezd-level data on the zemstvo elections after the 1880s and prior to 1907. Despite the lack of more recent data, comparing the turnout by voter groups in 1907 and in the 1880s allows me to test whether the early introduction of the local electoral institution is correlated with higher turnout in the national election. Correlation patterns for turnout are positive but weak for all voter groups, except for rural voters and landowners (see Figure 3.8).

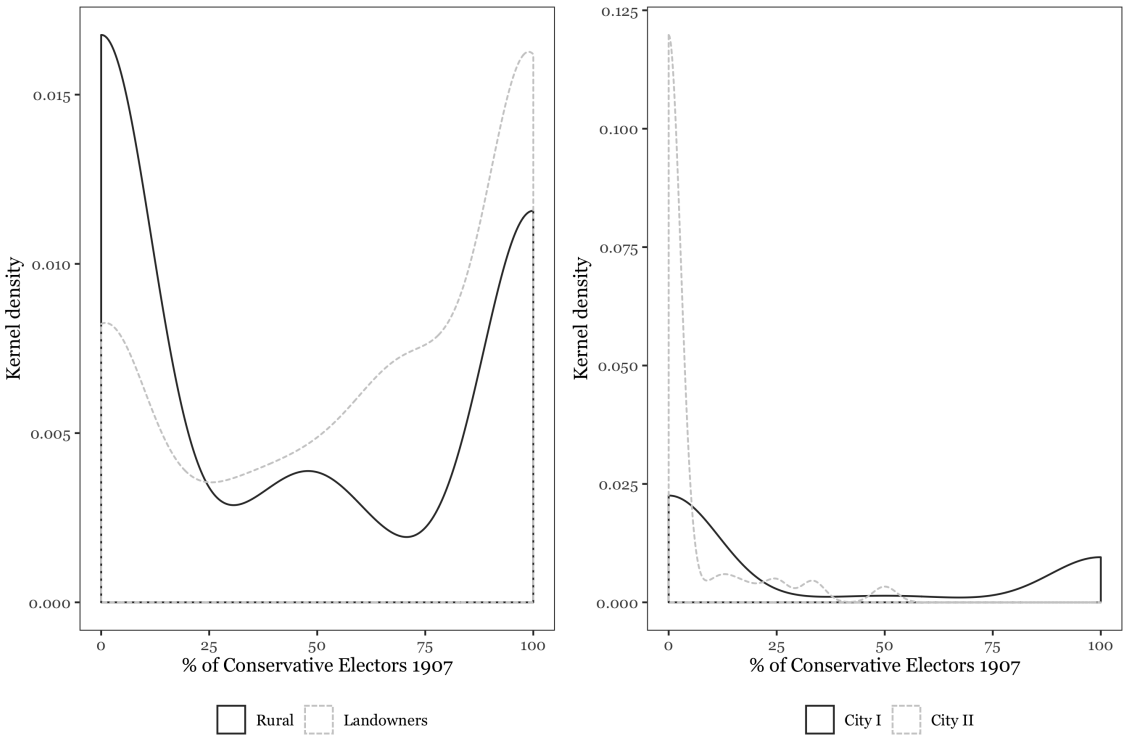


Figure 3.3: Percent of conservative electors elected by voter groups: the 1907 parliamentary election. Source: author's calculations based on archival sources.

In the empirical analyses, I am going to use the turnout rates in the 1880s elections as an additional control that might account for unobservable heterogeneity across districts (this is essentially a lagged dependent variable).

3.4.2 Landowners, industrialists, and state employees

To proxy for the political power of landowners, I calculated the Gini of landholding inequality by districts in 1905 based on the last available Imperial land census. The Gini coefficient ranges from zero to one, where higher values represents more inequality in land ownership. Land ownership is defined in this paper as private land owned by individuals (the gentry, the church, merchants, urban residents, peasants, and foreigners). In addition to private ownership, the Imperial census published data on communal ownership that I do not use in this paper. Communal ownership includes land owned by peasant communes, corporations and factories.

In the 1905 land census data, land ownership is split into 17 groups. The groups are structured in terms of the number of tithes (1.45 ha), e.g. the number of landowners with the total amount of land less than 10 tithes, from 10 to 20 tithes, etc. In addition, I calculate the share of land owned by the gentry in each district. From the data I find that private land inequality is positively related to the share of land owned by the gentry, but this correlation pattern is not very strong (0.3).

In addition, I proxy for the political power of industrial elites with the index of employment concentration. Using factory-level data, I calculate total employment at the district level, based on the 1890 factory census, and each factory's employment share within a district.[5] I measure employment concentration by calculating the *Herfindahl-Hirschman Index* (HHI) for employment. The index is defined in the following way:

$$\text{HHI}_i = \sum_{j=1}^{J_i} \text{s}_{ij}^2, \tag{3.1}$$

where $\text{s}_{ij} \in [0, 1]$ is the share of people employed at the factory j in the district i, and J_i is the total number of factories in the district i. The HH index ranges from $\frac{1}{J_i}$ to 1, where the value of 1 represents the monopoly power of the firm, and the value of $\frac{1}{J_i}$ represents perfect competition. In addition to the HH index by districts (*uezds*), I calculate the HH index for factory-level employment in cities (based on the locations of factories as reported in the 1890 factory census), to take into account that employment concentration patterns might be different in cities compared to rural areas. The two HH indices are positively correlated (0.4), but as expected, employment in cities in 1890 is more concentrated compared to overall employment in districts.

As the qualitative evidence discussed in section Section 3.2.4 suggests, the third important actor that could engage in electoral manipulation was the state. From the occupations data in 1897 digitized by Castañeda Dower and Markevich (2020), I calculate the percentage

[5]The most recent factory census prior to the 1907 election would be for 1900, but this data is not incorporated yet. Factory-level employment concentration would most likely decrease between 1890 and 1900, but HH indices should be strongly positively correlated.

of public officials employed in the local administration and the police. One caveat is that state employees were eligible to vote as urban voters (the City II group), therefore, positive correlation between electoral returns and the percentage of state employees in urban elections may simply reflect occupation patterns and not electoral intimidation. In addition, state employees might be intimidated by the tsarist regime to turn out and vote for the conservative parties. Therefore, I am currently unable to distinguish between these different mechanisms that would lead to higher electoral returns for the regime at the aggregate district level.

On average, landholding inequality was quite high in Imperial Russia (the median Gini of landholding inequality is 0.4). The median district had employment concentration around 0.2 which is considered to be moderate (0.3 in cities). The percentage of state employees out of total employment in districts is relatively low, with the median value of 0.8 percent.

3.4.3 Hypotheses

Based on the historical evidence for electoral repression and intimidation in the 1907 election, I test the following hypotheses:

- For urban voters (City II) and workers, since the two categories might overlap if factories are located in cities, I expect the main channel of electoral intimidation and repression to work through employment concentration. Higher *employment concentration* should lead to higher *turnout* and higher *percentage of elected conservative electors*.

- For peasants, I expect landed elites to be able to control their turnout and votes. Higher *land inequality* should lead to higher *turnout* and higher *percentage of elected conservative electors*.

- Higher *percentage of state employees* in a district should lead to higher *turnout* of peasants and workers and higher *percentage of conservative electors elected*. The positive effect of *percentage of state employees* on electoral results in rural elections can indicate electoral intimidation of peasants. At the same time, if state employees could pressure urban residents to turn out and vote and if state employees themselves were intimidated

by the regime, I would expect to see positive correlation between the percentage of state employees and *turnout* in the urban elections, and a higher *percentage of conservative electors* elected as a result.

3.4.4 Control variables

In addition to the main economic variables of interests, I collected the district-level data on the percentage of ethnically Russian population at the district level from the only available population census in Imperial Russia in 1897, as well as the data on the percentage of the Christian Orthodox population. Castañeda Dower and Markevich (2020) shows that during the 1917 Bolshevik election the districts with historically higher percentage of ethnic Russians (Eastern Slavics) were more likely to support left electors. It is unclear whether the same pattern should hold for the 1907 imperial parliamentary election. The percentage of Orthodox Christians is highly correlated with the percentage of ethnically Russian population (0.6), so I do not control for both of these variables at the same time in the empirical analyses and focus on the percentage of the Christian Orthodox population.

I also include dummy variables for the districts that experienced the wave of violent protests and pogroms during the revolution of 1905 and in 1906 that encompassed around 660 major cities and smaller towns in 23 provinces (in some of them pogroms happened more than once). The data on pogroms comes from Grosfeld et al. (2019). Finally, I collected the data on the percentage of Jewish population from the 1897 census. Russia had the largest Jewish diaspora in the world after annexing Poland in the 18th century. The tsarist government restricted the legal residence of Jewish population to the Pale of Settlement. Most of the pogroms happened inside the Pale of Settlement that included western regions of the empire.

3.4.5 Electoral fraud complaints

In addition to the district-level data on the 1907 election, I digitized the region-level data on the follow-up electoral complaints which were reported by districts to regional authorities. Figure 3.7 (Appendix 3.B) presents correlation patterns between the available measures of

electoral complaints. The available data is at the region (*guberniya*) level. For each region, the Ministry of Internal Affairs provides the statistics about the two types of complaints registered at the district (*uezd*) level: the total number of complaints about errors and mistakes in the lists of registered voters, and the complaints about the electoral process from the groups of rural voters and factory workers. I also know how many complaints regional electoral commissions received from the local (district-level) commissions. Each complaint was registered at the local level, then passed to the regional level, and then regional authorities reported selected cases to the Senate. For instance, the number of complaints in the 1907 election (per 1,000 registered voters) registered in the Moghilev region by local electoral commissions was over 40, but regional electoral commission ended up reviewing less than one complaint (per 1,000 voters). The data on electoral complaints is reflective of the anecdotal evidence discussed in Section 3.2.4, but it is not reliable as there is obviously a selection bias at the stage when complaints were filed and how each registered complaint was then handled at upper levels.

As a measure of electoral violations, I normalize the number of complaints by the number of registered voters (per 1,000 registered voters) in a region. This approach is similar to what Mares (2015) used for studying elections in Imperial Germany.[6] What is the relationship between the registered electoral irregularities and turnout of peasants, urban residents, and workers at the regional level? Figure 3.7 suggests that the type of complaints matters. Complaints related to voter registration (per 1,000 voters) are negatively associated with the turnout of peasants, and positively associated with the turnout of urban voters (City II). At the same time, the turnout of workers does not appear to be related to the officially registered number of complaints. There is a negative association between complaints related to voter registration and the percentage of factories where elections of electors failed. This negative association is most likely due to the efforts of local authorities and factory owners to manipulate the lists of eligible voters, as discussed in Section 3.2.4. When the most 'reliable' workers could participate in the election of electors, such elections were *less likely* to be declared as failed. At the same time, the association between the complaints related to the

[6] Mares (2015) calculates the ratio of the number of electoral irregularities to the number of elections.

elections of electors and the percentage of failed elections is positive. The qualitative evidence discussed in Section 3.2.4 suggests that elections could be declared as failed when local authorities disapproved of the 'unreliable' electors elected. When elections at factories failed, even the most 'reliable' workers complained about the manipulated selection of electors.

3.5 Empirical strategy

To test the mechanisms of electoral intimidation, I estimate the following linear equation for separate groups of voters:

$$y_{gij} = \beta_1 \text{HHI}_{ij} + \beta_2 \text{Gini}_{ij} + \beta_3 \text{StateEmployees}_{ij} + x'_{ij}\delta + \gamma_j + \varepsilon_{gij}, \tag{3.2}$$

where g indexes voter groups (workers, urban residents City I and City II, landowners, peasants), i indexes districts (*uezd*), j indexes regions (*guberniya*), y_{ij} is the electoral return variable in 1907 (turnout, the percentage of conservative electors elected, the percentage of failed elections). HHI_{ij} is a measure of economic concentration (the HH index of employment concentration) in 1890. As a reminder, I calculate two versions of the HH index for the factory-level employment: (i) the overall HHI of employment concentration at the district level, (ii) the HH of employment concentration at the district level in cities only (to be used in the regression specifications for the electoral outcomes in urban elections). Gini_{ij} is the Gini of inequality in private land ownership in 1905. $\text{StateEmployees}_{ij}$ is the percent of population employed in local administration (*zemstvo*) and the police in 1897. x_{ij} is the vector of controls, and γ_j is the set of region j fixed effects. I cluster standard errors at the district level i.

I expect that during the 1907 election three main groups of actors could engage in electoral manipulation on behalf of the tsarist regime: landowners ($Gini_{ij}$), industrialists (HHI_{ij}), and state employees ($\text{StateEmployees}_{ij}$).

The empirical strategy that I use is based on the assumption of selection on observables: I control for the characteristics of the districts (uezds) x_{ij} that I can measure based on the

archival data. x_{ij} include the percentage of Orthodox Christians in the district i and the electoral district (region) j, the percentage of Jewish population, the dummy variable if the district experienced major episodes of unrest in 1905–6 (pogroms), and the percentage of non-agricultural employment. This strategy does not allow to address the endogeneity concerns related to the unobservable characteristics of districts. I include the set of region fixed effects to mitigate the concerns about unobservable region-specific characteristics. As an alternative, I control for turnout in the local elections in the 1880s for the same (or similar) groups of voters (a proxy for the lagged dependent variable). Therefore, in the next section the discussion of my empirical results is structured around association between electoral returns and different channels of voter intimidation, not causal effects.

3.6 Results and discussion

I estimate two sets of models: first, I estimate Equation (3.2) with the set of controls and region fixed effects, then I add turnout in local level elections (*zemstvo*) in the 1880s as a control variable and remove region fixed effects.[7]

I present the estimation results for Equation (3.2) by groups of voters: rural voters, workers, urban voters (City I and City II), and landowners (large and small). For the sake of simplicity, Figure 3.4 plots the main coefficients of interest from Table 3.2 and Table 3.3 (Appendix 3.B). The main effects I am interested in are the effect of employment concentration, landholding inequality, and the percentage of state employees.

Landholding inequality is a proxy for the power of landowners in a district (*uezd*). The effect of landholding inequality is positive for the rural elections where some peasants were eligible to vote, in the model specification without region fixed effects and for the sub-sample of districts which had local elections in the 1880s. This results is indicative of landowners' power to mobilize peasants to turn out and vote. Interestingly, the effect of landholding inequality is positive for the turnout of small landowners during the 'preliminary' election

[7]Since the sample size is relatively small, the concern is that including region fixed effects may overfit the data.

when they were required to select the representatives who can then vote in the main election along with large landowners. Some of the small landowners could be wealthy peasants, therefore, higher land inequality in a district motivated them to turn out and vote.

Employment concentration at the factory level does not appear to be related to the turnout of workers. The observed variation in the turnout of workers can be partially driven by workers boycotting the election and abstaining from voting. There is a negative and marginally significant effect of employment concentration for the turnout of urban residents. This effect could be indicative of the factory owners' pressure on workers at the factories located in cities, since workers in cities could register and vote as urban residents (if eligible). The negative effect of employment concentration is also present for the turnout of peasants, but can be interpreted as a by-product of the economic structure of the district. Higher employment concentration at the factory level is a characteristic of industrial and not agricultural districts.

Finally, the qualitative evidence suggests that electoral intimidation was practiced by state employees. I proxy for the power of the state with the share of state employees from the 1897 population census. I find that a higher share of state employees relative to the total employment in a district is associated with higher turnout of urban residents (both in the City I and City II elections), see Figure 3.4. This result could be explained by the higher turnout of state employees themselves, as they were eligible to register and vote as urban residents (or could be intimidated to support the tsarist regime). There is a statistically significant negative effect on the turnout of peasants (in the model without fixed effects, controlling for the turnout in local level elections). This could support the qualitative evidence suggesting that state employees tried to control the turnout of peasants and prevent 'undesired' individuals from showing up to vote.

How do the effects of electoral intimidation on turnout translate into which electoral representative are elected? I expect that the electoral intimidation and repression of voters in the 1907 election should result in the higher percentage of conservative pro-tsarist legislators being elected.[8] Figure 3.5 summarizes the main results from Table 3.4 and Table 3.5

[8]There is no detailed data on the percentage of conservative electors elected from workers at the district level.

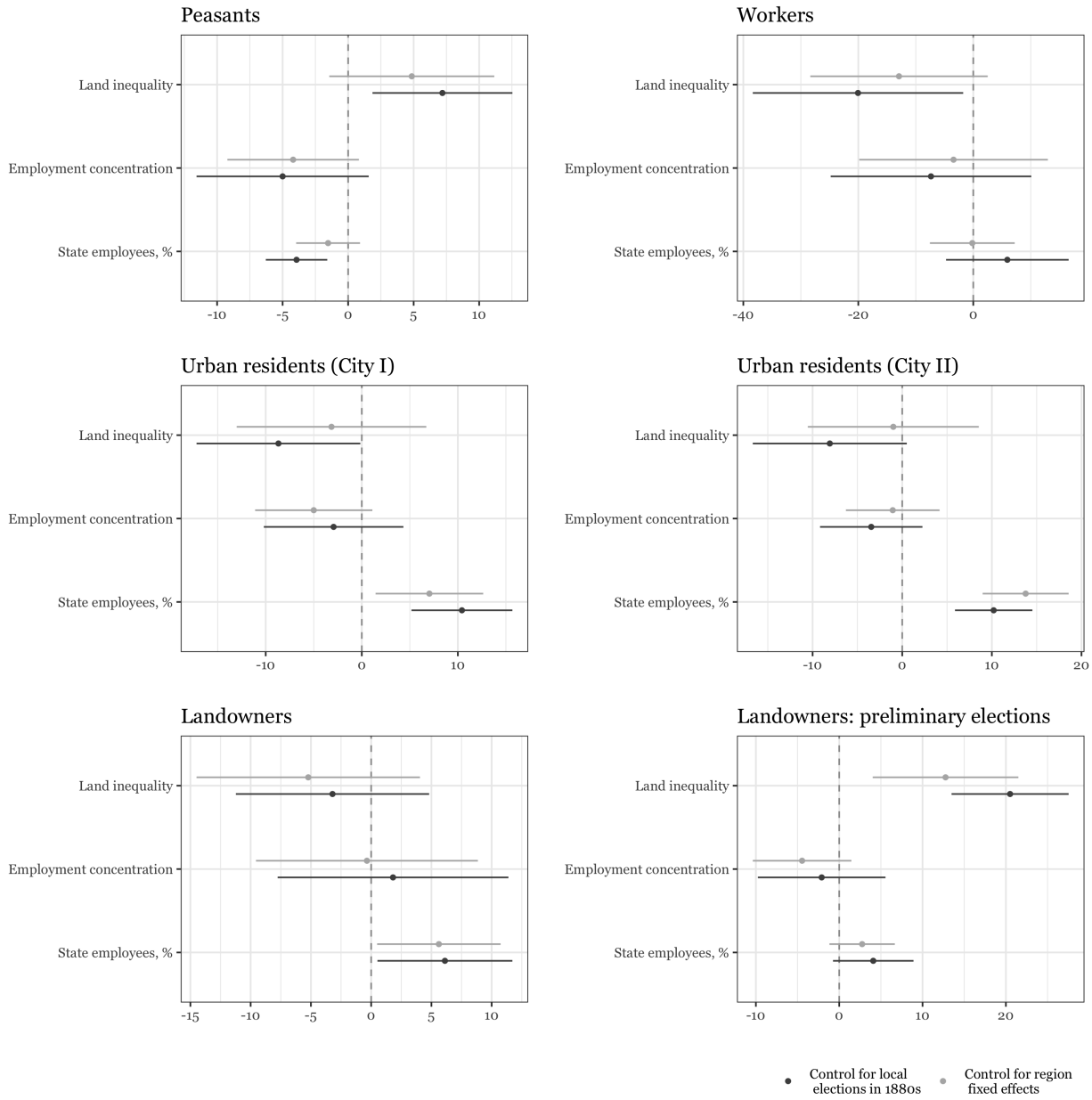


Figure 3.4: Summary of the main estimation results: Turnout by groups of voters and the Gini of land inequality, employment concentration, and the percentage of state employees (with 95% confidence intervals)

(Appendix 3.B). There is a statistically significant positive association between employment concentration and the percentage of conservative electors from urban voters (City I). Combined with the effects on turnout from Figure 3.4, it appears that higher employment concentration (marginally) decreased the turnout of urban voters and increased the percentage of right electors elected.

Overall, the results of the regression analyses are in line with the results of the parliamentary election in 1907: pro-tsarist conservative parties did not get a majority of votes, and it could be because at the local level electoral manipulation did not result in substantively more conservative electors being elected, despite the higher turnout in the presence of electoral manipulation.

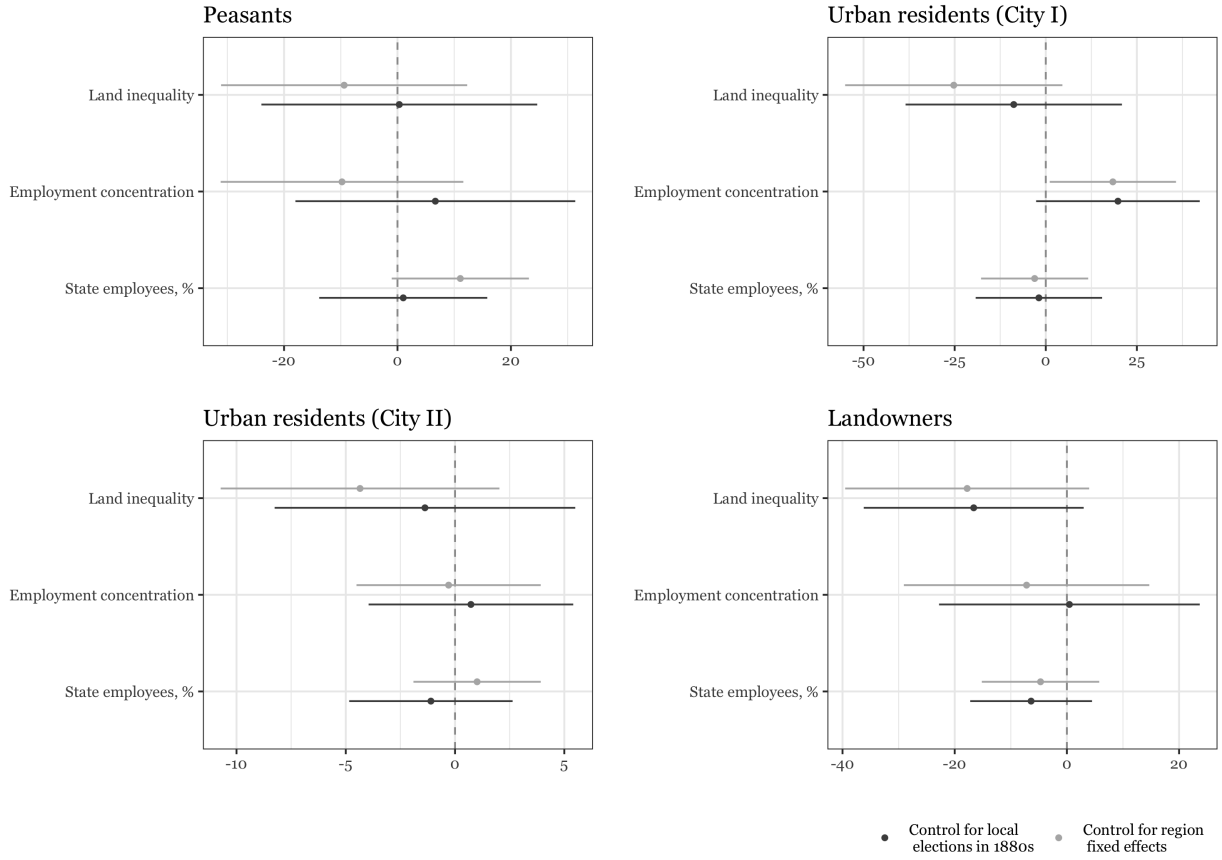


Figure 3.5: Summary of the main estimation results: Percentage of rightist electoral representatives elected by groups of voters and the Gini of land inequality, employment concentration, and the percentage of state employees (with 95% confidence intervals)

The empirical results suggest that there is some evidence of turnout being manipulated by the tsarist regime's main vote brokers: landowners, industrialists, and state employees. However, the results are observed mostly for the turnout of urban voters and peasants. Does it mean that there is no evidence of the elites' attempts to influence the elections held by factory workers? To answer this question, I look at the third outcome variable from the archival data, the percentage of failed elections by voter groups at the district level. Figure 3.6 (based

on Table 3.6, Appendix 3.B) presents the empirical results for the effects of employment concentration, the Gini of land inequality, and the percentage of state employees on the percentage of failed elections. The data on failed elections is available only for some groups of voters: workers and peasants (rural elections). If elections in a district failed (the most likely reason was voter absenteeism due to electoral repression), then the representatives from workers were not selected to participate in the elections of legislators. Figure 3.9 (Appendix 3.B) suggests that a higher percentage of failed elections was associated with a lower turnout of workers and peasants.

I summarize the results from Table 3.6 and Table 3.7 (Appendix 3.B) in Figure 3.6. Higher employment concentration at the factory level is associated with a lower percentage of failed elections at factories (this result is marginally significant). In addition, higher landholding inequality is associated with a lower percentage of failed rural elections (in the regression specification with a lagged electoral outcome, i.e. turnout in the local elections in the 1880s). Potentially, it means that wealthy factory owners that were dominant employers in their districts exercised more control over their workers and could deliver desired results to the tsarist regime, and local authorities had no reason to declare that elections failed. I observe a similar effect in the districts with higher land inequality: rural elections were also less likely declared as failed.

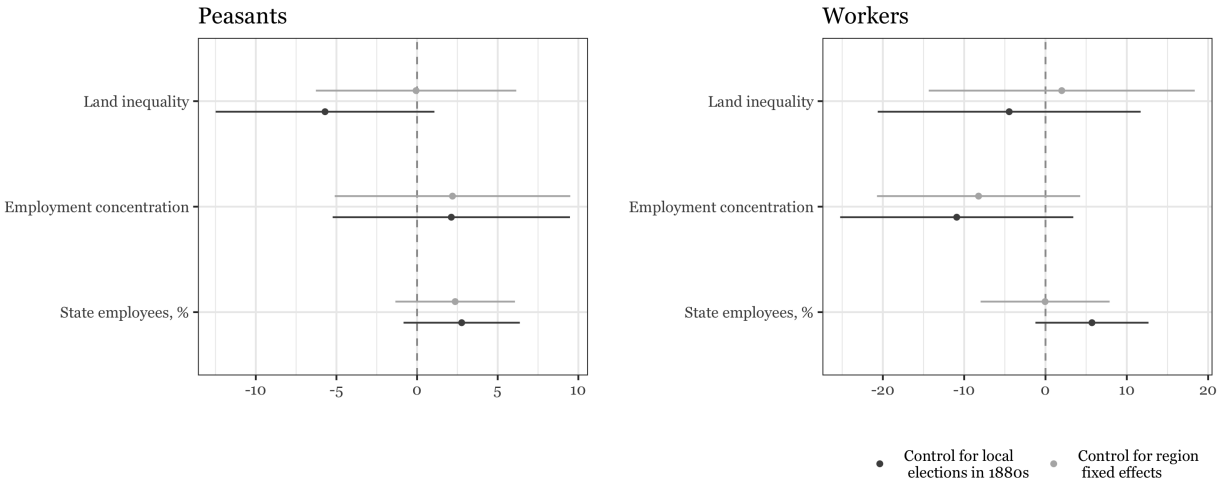


Figure 3.6: Summary of the main estimation results: Percentage of failed elections by groups of voters and the Gini of land inequality, employment concentration, and the percentage of state employees (with 95% confidence intervals)

3.7 Conclusion

This is the first empirical analysis of the 1907 parliamentary election in Imperial Russia. Using newly digitized data from archival sources, I investigate the empirical relationship between land inequality, employment concentration, the percentage of state employees and electoral results in Russia's districts: turnout, the percentage of elected conservative electors, and the percentage of failed elections. I find that land inequality is positively associated with the turnout of peasants, which indicates the power of landowners in rural areas. Higher employment concentration, which indicates the power of industrialists, does not appear to affect the turnout of workers directly. However, higher employment concentration is negatively associated with the percentage of failed elections at factories. In addition, I find that possible electoral manipulation by the industrial elites in cities resulted in a higher percentage of pro-tsarist conservative electors being elected in urban elections.

3.A Appendix: Archival sources

3.A.1 Legislation

Vysochaishiy Manifest 17 oktyabrya 1905 g. i ego znachenie dlya russkogo naroda [The Highest Manifesto of October 17, 1905 and its significance for the Russian people]. Kazan', 1905.

Polnoe sobranie podrobnykh programm suschestvuyuschikh politicheckikh partiy. Prilozheniya: Zakon 6 avgusta, Zakon 11 dekabrya, Manifest 17 okrtyabrya i doklad st. sekr. gr. Vitte i pravila o vyborakh v Gos. Dumy vysoch. utv. 18 sent. 1906. [Detailed manifestos of political parties with appendices (the law from Aug 6, the law from Dec 11, the Manifesto from October 17, the report by Vitter about the electoral process into the State Duma signed on Sept 18. 1906)]. Izd. Ch. A. g. Vilna: Tipographiya "Russkiy pochin", 1906

3.A.2 Data sources

Ministerstvo Vnutrennikh Del, Vybory v Gosudarstvennuyu Dumu tretiyago sozyva: Statisticheskiy otchet Osobago Deloproizvodstva [Ministry of Internal Affairs.]. Tipographiya Ministerstva Vnutrennikh Del, 1911.

Statistika vyborov v zemskie uchrezhdeniya za 1883–1886 gg. Statistika Rossiyskoy Imperii, vyp. 5. [The Statistics on the elections into the local assemblies in 1883–1886. The Statistics of Russian Empire, vol. 5] S-Peterburg, 1888. Source: Gosudarstvennaya Publichnaya Istoricheskaya Biblioteka Rossii [Russia's State Public Historical Library].

Orlov, Petr Aleksandrovich (1894). *Ukazatel' fabrik i zavodov Evropeiiskoi Rossii [A Directory of Factories in European Russia].* St. Petersburg: Tipografiia V. Kirshbauma.

Statistika zemlevladeniya,1905–1907. Vypusk 1–50. Tsentral'niy Statisticheskiy Komitet M.V.D. [The Statistics on Land Ownership, 1905–1907. Volumes 1–50 [Central Statistical Committee of the Ministry of Internal Affairs.]. S-Peterburg, 1905–1907. Source: The Russian State Library (RSL).

Pervaya vseobshchaya perepis naseleniya Rossijskoj imperii 1897 g. pod redaktsiey N.A. Troynitskago. Vypusk 4. Okonchatel'no ustanovlennoe pri razrabotke perepisi nalicnoe nasele-

nie Imperii po uezdam. [The first population census of the Russian empire, N.A. Troynitskiy (ed.). Vol. 4. The final data from the 1897 census on the population by districts].. S-Peterburg, 1905. Source: The Russian State Library (RSL).

Pervaya vseobshchaya perepis naseleniya Rossijskoj imperii 1897 g. pod redaktsiey N.A. Troynitskago. Vypusk 6. Nalichnoe naselenie oboego pola po uezdam i gorodam, s ukazaniem preobladayuschikh veroispovedaniy i glavneyshikh sosloviy. [The first population census of the Russian empire, N.A. Troynitskiy (ed.). Vol. 4. The population by gender at the district and city level, with the detailed information about religion and social class]. S-Peterburg, 1905. Source: The Russian State Library (RSL).

Pervaya vseobshchaya perepis naseleniya Rossijskoj imperii 1897 g. pod redaktsiey N.A. Troynitskago. Vypusk 7. Nalichnoe naselenie oboego pola to uezdam, s ukazaniem chisla lits preobladayuschikh yazykov. [The first population census of the Russian empire, N.A. Troynitskiy (ed.). Vol. 1. The population by gender at the district and city level, with the detailed information about major languages. Volume 7.] S-Peterburg, 1905. Source: The Russian State Library (RSL).

Pervaya vseobshchaya perepis naseleniya Rossijskoj imperii 1897 g. pod redaktsiey N.A. Troynitskago. [The first population census of the Russian empire, N.A. Troynitskiy (ed.).], S-Peterburg, 1900–10. The dataset on occupations by sector at the district (*uezd*) level was kindly shared by Andrei Markevich and Paul Castañeda Dower.

3.B Appendix: Summary statistics and estimation results

Table 3.1: Summary statistics

Statistic	N	Mean	St. Dev.	Min	Max
Rural turnout 1907, %	492	68.278	10.529	21.000	96.000
Worker turnout 1907, %	293	38.860	27.266	1.000	100.000
City residents I turnout 1907, %	495	34.766	14.967	4.000	92.000
City residents II turnout 1907, %	486	29.846	14.507	1.000	82.000
Landowner (final) turnout 1907, %	487	46.940	17.131	4.000	100.000
Landowner (small) turnout 1907, %	473	17.700	16.381	1.000	100.000
Conservative electors 1907: rural, %	483	41.896	45.428	0.000	100.000
Conservative electors 1907: city I, %	483	30.940	44.704	0.000	100.000
Conservative electors 1907: city II, %	472	4.057	10.622	0.000	50.000
Conservative electors 1907: landowners, %	466	62.537	39.240	0.000	100.000
HHI employment 1890 (district)	489	0.231	0.204	0.007	1.000
HHI employment 1890 (in cities)	357	0.431	0.319	0.007	1.000
Gini of land inequality 1905	521	0.401	0.215	0.000	0.947
Land owned by the gentry 1905, %	521	0.587	0.243	0.000	1.000
Russian population 1897, %	485	79.658	28.703	0.243	99.968
Non-agriculatural employment 1890, %	478	40.992	16.557	6.849	98.927
Zemstvo turnout 1880s: rural, %	355	81.349	12.633	21.984	102.488
Zemstvo turnout 1880s: all landowners, %	354	25.331	14.501	4.845	78.947
Zemstvo turnout 1880s: small landowners, %	346	18.043	17.270	0.238	95.000
Zemstvo turnout 1880s: urban voters, %	353	27.608	15.783	1.943	80.392
Pogrom dummy 1905–6	521	0.150	0.357	0.000	1.000
Orthodox Christians 1897, %	480	80.520	28.353	0.284	99.963
Jewish population 1897, %	521	3.383	5.768	0.000	29.000
Failed worker elections, %	504	20.919	30.521	0.000	100.000
Failed rural elections, %	504	9.637	13.385	0.000	66.667
State employees, %	478	0.905	0.425	0.384	3.880
Rural electors: # total	483	2.197	1.204	1.000	7.000
City I electors: # total	483	1.418	0.966	1.000	8.000
City II electors: # total	475	1.120	0.344	1.000	3.000
Landowner (final) electors: # total	466	5.225	2.583	1.000	17.000
Worker electors: # total (region-level)	42	2.452	1.685	1.000	9.000

Notes:
Zemstvo turnout: elections into local assemblies

Table 3.2: Turnout in 1907, percent: baseline results, with the control for the turnout in local elections in the 1880s

	volost	workers	city1	city2	landown	prelim landown
	(1)	(2)	(3)	(4)	(5)	(6)
Zem rural turnout	0.021					
	(0.045)					
Zem urban turnout		0.122	0.083	−0.016		
		(0.126)	(0.069)	(0.073)		
Zem landown turnout					0.281***	
					(0.079)	
Zem prelim landown turnout						0.160***
						(0.061)
HHI of employment 1890	−5.000	−7.356			1.814	−2.105
	(3.352)	(8.903)			(4.885)	(3.906)
HHI of employment 1890 cities			−2.935	−3.458		
			(3.707)	(2.915)		
Gini of land inequality 1905	7.196***	−20.053**	−8.678**	−8.083*	−3.208	20.503***
	(2.724)	(9.337)	(4.349)	(4.384)	(4.091)	(3.584)
% of non-agric employment	0.163***	−0.596***	−0.020	0.086	−0.135*	−0.142***
	(0.036)	(0.113)	(0.069)	(0.065)	(0.075)	(0.053)
% of state employees	−3.938***	5.926	10.423***	10.203***	6.119**	4.084*
	(1.196)	(5.440)	(2.680)	(2.203)	(2.857)	(2.464)
Pogrom 1905–6 dummy	−5.390	2.515	6.866*	9.635**	7.687**	0.684
	(3.637)	(6.411)	(3.707)	(3.816)	(3.640)	(2.180)
% of Orthodox Christians	−0.080*	0.148	−0.004	0.131**	0.183**	−0.029
	(0.046)	(0.213)	(0.064)	(0.063)	(0.076)	(0.084)
% of Jewish population	−0.189	0.558	−0.539	−0.292	−0.640**	−0.888***
	(0.271)	(0.967)	(0.495)	(0.529)	(0.260)	(0.327)
N	310	188	203	208	315	311
R^2	0.155	0.206	0.116	0.187	0.121	0.225

Notes:

***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.
Standard errors, clustered by district (uezd), in parentheses.
volost = rural elections (peasants), landown = final elections for landowners,
prelim landowners = preliminary electons for small landowners,
zem turnout = turnout in the elections into local assemblies (*zemstvo*).

Table 3.3: Turnout in 1907, percent: robustness checks, with region fixed effects included

	volost	workers	city1	city2	landowners	prelim landowners
	(1)	(2)	(3)	(4)	(5)	(6)
HHI of employment 1890	−4.199	−3.432			−0.351	−4.455
	(2.560)	(8.371)			(4.697)	(3.019)
HHI of employment 1890 cities			−5.001	−1.060		
			(3.114)	(2.665)		
Gini of land inequality 1905	4.854	−12.919	−3.154	−0.997	−5.220	12.759***
	(3.213)	(7.873)	(5.036)	(4.867)	(4.729)	(4.458)
% of non-agric employment	0.008	−0.461***	0.001	0.028	−0.136*	−0.168***
	(0.042)	(0.137)	(0.085)	(0.086)	(0.078)	(0.064)
% of state employees	−1.531	−0.166	7.036**	13.770***	5.617**	2.749
	(1.243)	(3.763)	(2.858)	(2.447)	(2.614)	(2.001)
Pogrom 1905–6 dummy	−1.079	0.649	5.690**	3.627	−0.158	2.115
	(1.880)	(3.396)	(2.315)	(2.385)	(2.394)	(2.122)
% of Orthodox Christians	−0.001	0.217	−0.027	−0.102	0.139**	0.115*
	(0.040)	(0.193)	(0.075)	(0.089)	(0.061)	(0.066)
% of Jewish population	0.419	1.745***	−0.351	−0.440	0.258	−0.032
	(0.288)	(0.601)	(0.332)	(0.420)	(0.277)	(0.397)
Region fixed effects	✓	✓	✓	✓	✓	✓
N	436	259	316	310	435	423
R^2	0.357	0.562	0.370	0.389	0.391	0.555

Notes:

***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.
Standard errors, clustered by district (uezd), in parentheses.
volost = rural elections (peasants), landown = final elections for landowners,
prelim landowners = preliminary electons for small landowners,
zem turnout = turnout in the elections into local assemblies (*zemstvo*).

Table 3.4: Rightist electors elected in 1907, percent: baseline results, with the control for the turnout in local elections in the 1880s

	volost	city1	city2	landowners
	(1)	(2)	(3)	(4)
Zem rural turnout	−0.017			
	(0.212)			
Zem landown turnout				−0.372**
				(0.165)
HHI of employment 1890	6.674			0.447
	(12.587)			(11.857)
Zem urban turnout		−0.365	−0.086*	
		(0.238)	(0.047)	
HHI of employment 1890 cities		19.802*	0.727	
		(11.454)	(2.389)	
Gini of land inequality 1905	0.321	−8.788	−1.377	−16.613*
	(12.407)	(15.146)	(3.509)	(10.003)
% of non-agric employment	0.230	0.261	−0.019	−0.096
	(0.184)	(0.230)	(0.065)	(0.150)
% of state employees	1.015	−1.892	−1.104	−6.381
	(7.559)	(8.848)	(1.908)	(5.540)
Pogrom 1905–6 dummy	−6.981	−13.164	2.040	−7.365
	(12.502)	(13.621)	(3.602)	(9.272)
% of Orthodox Christians	0.280	0.488**	0.039	0.435**
	(0.227)	(0.220)	(0.105)	(0.212)
% of Jewish population	0.848	1.130	−0.064	2.687***
	(1.244)	(1.285)	(0.168)	(0.617)
Constant	6.085	−10.866	4.698	46.802*
	(30.675)	(26.518)	(12.452)	(24.049)
N	314	208	203	315
Adjusted R^2	−0.012	0.015	−0.021	0.061

Notes: ***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.
Standard errors, clustered by district (uezd), in parentheses.
volost = rural elections (peasants), landowners = final elections for landowners,
zem turnout = turnout in the elections into local assemblies (*zemstvo*).

Table 3.5: Rightist electors elected in 1907, percent: robustness checks, with region fixed effects included

	volost	city1	city2	landowners
	(1)	(2)	(3)	(4)
HHI of employment 1890	−9.782			−7.188
	(10.915)			(11.162)
HHI of employment 1890 cities		18.409**	−0.294	
		(8.836)	(2.151)	
Gini of land inequality 1905	−9.405	−25.246*	−4.347	−17.779
	(11.069)	(15.205)	(3.254)	(11.097)
% of non-agric employment	−0.193	0.284	−0.054	0.112
	(0.200)	(0.261)	(0.058)	(0.189)
% of state employees	11.079*	−3.057	1.010	−4.700
	(6.171)	(7.498)	(1.486)	(5.341)
Pogrom 1905–6 dummy	12.308*	2.372	1.693	4.301
	(6.994)	(5.983)	(1.518)	(4.991)
% of Orthodox Christians	−0.113	0.221	−0.046	0.293**
	(0.192)	(0.208)	(0.069)	(0.147)
% of Jewish population	0.923	0.829	0.042	0.201
	(0.980)	(0.970)	(0.209)	(0.580)
Region fixed effects	✓	✓	✓	✓
N	427	310	304	419
Adjusted R^2	0.346	0.228	0.014	0.361

Notes:

***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.
Standard errors, clustered by district (uezd), in parentheses.
volost = rural elections (peasants), landowners = final elections for landowners,
zem turnout = turnout in the elections into local assemblies (*zemstvo*).

Table 3.6: Failed elections in 1907, percent: baseline results, with the control for turnout in the local zemstvo elections in the 1880s

	volost	workers
	(1)	(2)
Zem rural turnout	−0.065	
	(0.057)	
Zem urban turnout		−0.059
		(0.115)
HHI of employment 1890	2.124	−10.916
	(3.754)	(7.313)
Gini of land inequality 1905	−5.706	−4.464
	(3.460)	(8.247)
% of non-agric employment	−0.065	0.339***
	(0.043)	(0.105)
% of state employees	2.766	5.714
	(1.839)	(3.548)
Pogrom 1905–6 dummy	−1.528	15.093
	(3.621)	(9.712)
% of Orthodox Christians	0.232***	0.027
	(0.046)	(0.115)
% of Jewish population	0.954**	−0.943
	(0.480)	(0.737)
N	320	318
Adjusted R^2	0.054	0.067

Notes:

***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.
Standard errors, clustered by district (uezd), in parentheses.
volost = rural elections (peasants).

Table 3.7: Failed elections in 1907, percent: robustness checks, with region fixed effects included

	volost	workers
	(1)	(2)
HHI of employment 1890	2.196	−8.228
	(3.726)	(6.374)
Gini of land inequality 1905	−0.062	1.999
	(3.169)	(8.345)
% of non-agric employment	0.017	0.444***
	(0.058)	(0.131)
% of state employees	2.363	−0.048
	(1.891)	(4.047)
Pogrom 1905–6 dummy	−1.294	−0.860
	(1.843)	(3.852)
% of Orthodox Christians	0.012	0.177*
	(0.047)	(0.099)
% of Jewish population	−0.093	−0.644
	(0.258)	(0.506)
Region fixed effects	✓	✓
N	446	446
Adjusted R^2	0.290	0.348

Notes:
***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.
Standard errors, clustered by district (uezd), in parentheses.
volost = rural elections (peasants).

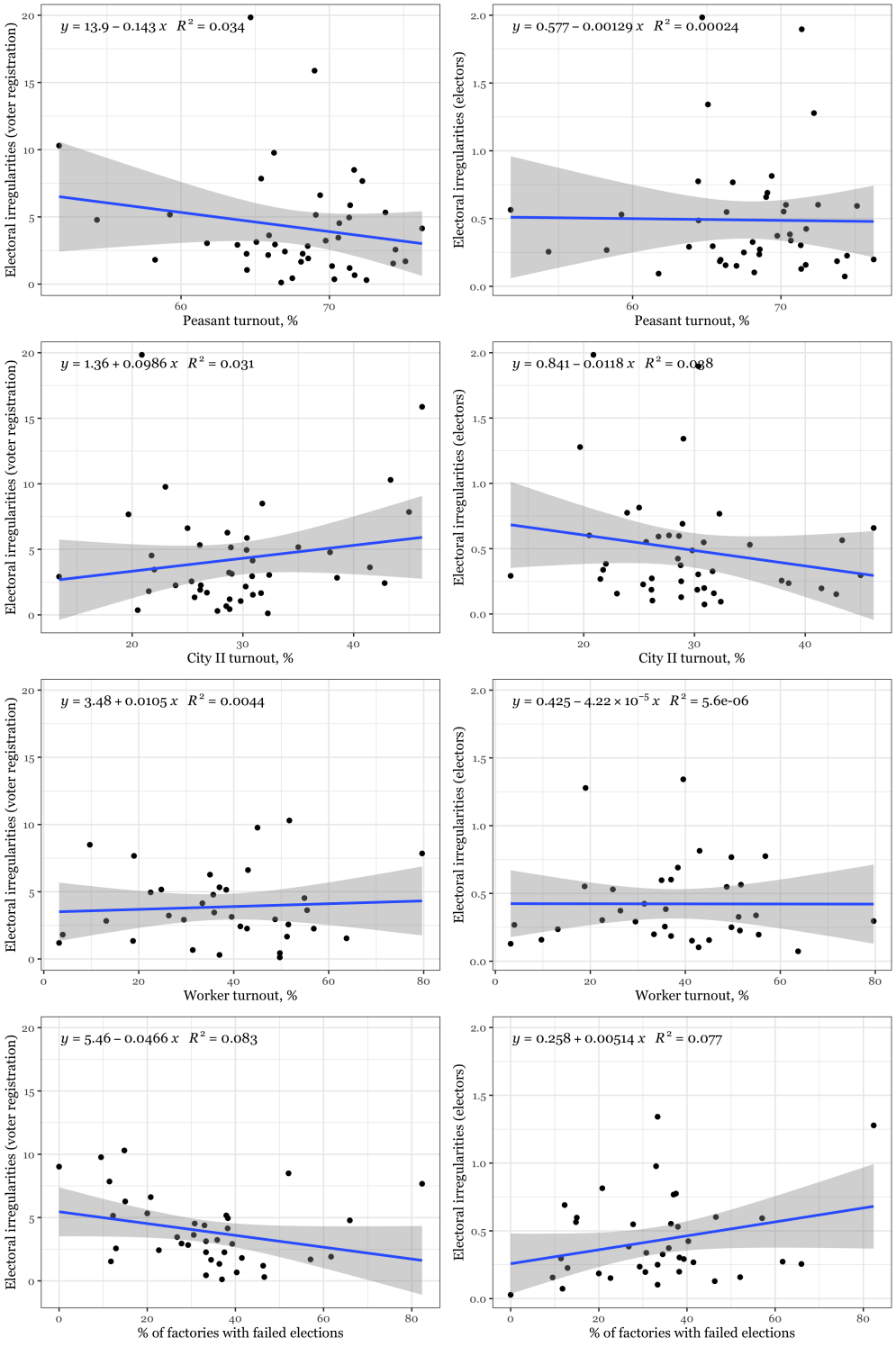


Figure 3.7: Electoral irregularities reported in 1907. Source: author's calculations based on archival sources.

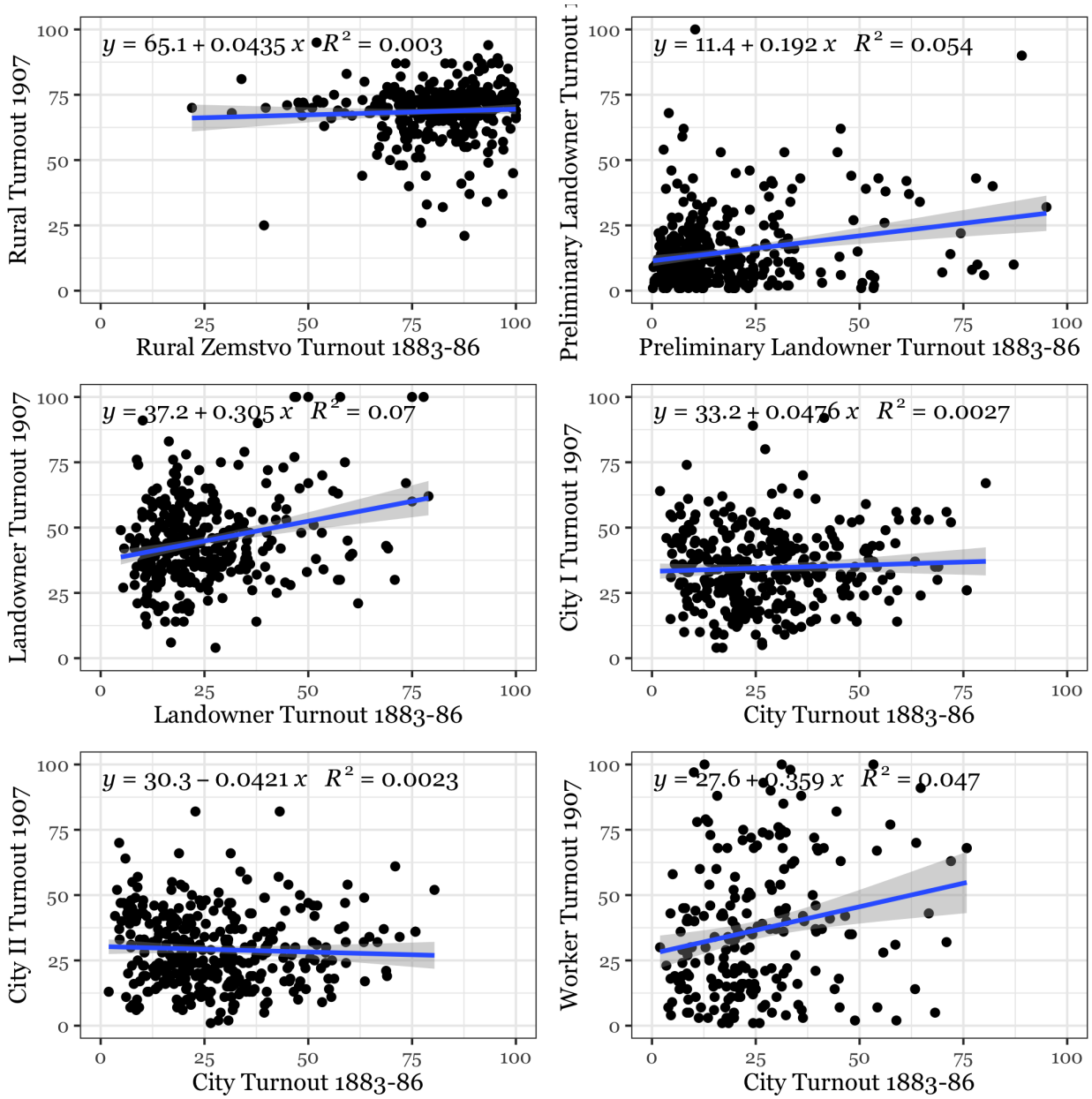


Figure 3.8: Turnout by voter groups: the 1907 parliamentary election and 1883–86 local (*zemstvo*) elections. Source: author's calculations based on archival sources.

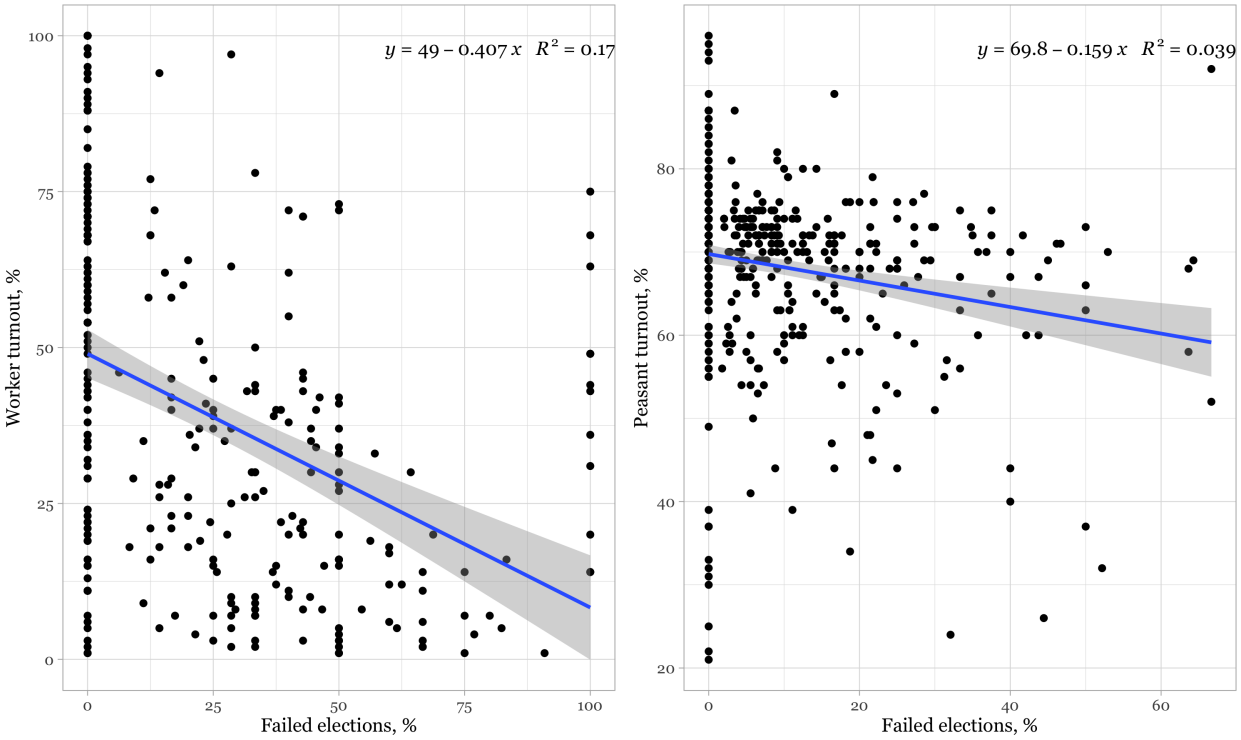


Figure 3.9: The relationship between the percentage of failed elections and the turnout of workers and peasants in the 1907 election of electoral representatives

Bibliography

Acemoglu, Daron, "Oligarchic versus Democratic Societies," *Journal of the European Economic Association*, 2008, *6* (1), 1–44.

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

Aizenberg, Lev Moiseevich, "Velikii Kniaz' Sergei Aleksandrovich, Vitte i Evrei-Kuptsy," in Iu. Snopov and A. Klempert, eds., *Evrei v Moskve (sbornik materialov)*, Mosty kul'tury—Gesharim, 2003, pp. 337–355. [In Russian: *Grand Duke Sergei Aleksandrovich, Vitte, and Jewish Merchants*]. Reprint of the 1930 ed.

Ansell, Ben and David Samuels, "Inequality and Democratization: A Contractarian Approach," *Comparative Political Studies*, 2010, *43* (12), 1543–1574.

Atack, Jeremy, Fred Bateman, and Robert A. Margo, "Steam power, establishment size, and labor productivity growth in nineteenth century American manufacturing," *Explorations in Economic History*, 2008, *45*, 185–198.

Baland, Jean-Marie and James A. Robinson, "Land and Power: Theory and Evidence from Chile," *The American Economic Review*, 2008, *98* (5), 1737–1765.

_ **and** _ , "The Political Value of Land: Political Reform and Land Prices in Chile," *American Journal of Political Science*, 2012, *56* (3), 601–619.

Barro, Robert J., "The Control of Politicians: An Economic Model," *Public Choice*, 1973, *14*, 19–42.

Becker, Sascha and Erik Hornung, "The Political Economy of the Prussian Three-class Franchise," *London, Centre for Economic Policy Research*, 2019.

Becker, Sascha O. and Luigi Pascali, "Religion, Division of Labor, and Conflict: Anti-semitism in Germany over 600 Years," *American Economic Review*, 2019, *109* (5), 1764–1804.

Blair, Margaret M., "Locking in Capital: What Corporate Law Achieved for Business Organizers in the Nineteenth Century," *UCLA Law Review*, 2003, *51*, 387–455.

Boix, Carles, *Democracy and Redistribution* Cambridge Studies in Comparative Politics, Cambridge University Press, 2003.

Bracco, Emanuele, Francesco Porcelli, and Michela Redoano, "Incumbent Effects and Partisan Alignment in Local Elections: A Regression Discontinuity Analysis Using Italian Data," 2013.

Buckley, Noah, Guzel Garifullina, Ora Reuter, and Alexandra Shubenkova, "Elections, appointments, and human capital: The case of Russian mayors," *Demokratizatsiya*, 01 2014, *22*, 87–116.

Cheremukhin, Anton, Mikhail Golosov, Sergei Guriev, and Aleh Tsyvinski, "The Industrialization and Economic Development of Russia Through the Lens of a Neoclassical Growth Model," *Review of Economic Studies*, 2017, *84* (2), 613–649.

Chernina, Eugenia, Paul Castañeda Dower, and Andrei Markevich, "Property rights, land liquidity, and internal migration," *Journal of Development Economics*, 2014, *110* (C), 191–215.

Djankov, Simeon, Rafael La Porta, Florencio Lopez de Silanes, and Andrei Shleifer, "The Regulation of Entry," *Quarterly Journal of Economics*, 2002, *117* (1), 1–37.

Dower, Paul Castañeda and Andrei Markevich, "The Stolypin reform and agricultural productivity in late imperial Russia," *European Review of Economic History*, 06 2018. hey015.

_ **and** _ , "Democratic support for the Bolshevik Revolution: An empirical investigation of 1917 Constituent Assembly elections," *SSRN Working Paper, Feb 11, 2020*, 2020.

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

Easterbrook, Frank H. and Daniel R. Fischel, "Limited Liability and the Corporation," *University of Chicago Law Review*, 1985, *52*, 89–117.

Enikolopov, Ruben, Vasily Korovkin, Maria Petrova, Konstantin Sonin, and Alexei Zakharov, "Field experiment estimate of electoral fraud in Russian parliamentary elections," *Proceedings of the National Academy of Sciences*, 2013, *110* (2), 448–452.

Ferejohn, John, "Incumbent Performance and Electoral Control," *Public Choice*, 1986, *50* (1/3), 5–25.

Fiorina, Morris P., "Economic Retrospective Voting in American National Elections: A Micro-Analysis," *American Journal of Political Science*, 1978, *22* (2), 426–443.

Flux, A. W., "The Census of Production," *Journal of the Royal Statistical Society*, 1924, *87* (3), 351–390.

Forrat, Natalia, "Shock-Resistant Authoritarianism: Schoolteachers and Infrastructural State Capacity in Putin's Russia," *Comparative Politics*, 2018, *50* (3), 417–449.

Franck, Rafael and Oded Galor, "Industrial Development and Long-Run Prosperity," 2017. Mimeo.

Frye, Timothy, Ora John Reuter, and David Szakonyi, "Political Machines at Work Voter Mobilization and Electoral Subversion in the Workplace," *World Politics*, 2014, *66* (2), 195–228.

_ , _ , **and** _ , "Vote Brokers, Clientelist Appeals, and Voter Turnout: Evidence from Russia and Venezuela," *SSRN Working Paper*, 2017.

_ , _ , **and** _ , "Hitting Them With Carrots: Voter Intimidation and Vote Buying in Russia," *British Journal of Political Science*, 2018, pp. 1–25.

_ , _ , **and** _ , "Hitting Them With Carrots: Voter Intimidation and Vote Buying in Russia," *British Journal of Political Science*, 2019, *49* (3), 857–881.

_ , _ , **and** _ , "Vote Brokers, Clientelist Appeals, and Voter Turnout: Evidence from Russia and Venezuela," *World Politics*, 2019, *71* (4), 710–746.

Gerschenkron, Alexander, *Economic Backwardness in Historical Perspective: A Book of Essays*, Cambridge, MA: Belknap Press, 1962.

Gessen, *Zakon i zhizn': Kak sozidalis' ogranichitel'nye zakona o zhitel'stve evreev v Rossii*, St. Petersburg: Tipografiia A. G. Rozena, 1911. [In Russian: *Law and Life: How Residential Restrictions against Jews Were Designed*].

Gilbert, George, *The Radical Right in Late Imperial Russia: Dreams of a True Fatherland?*, Routledge, 2016.

Goetzmann, William N. and Simon Huang, "Momentum in Imperial Russia," *Journal of Financial Economics*, 2018, *130* (3), 579–591.

Gregg, Amanda G., "Factory Productivity and the Concession System of Incorporation in Late Imperial Russia, 1894–1908," *American Economic Review*, 2019, *forthcoming.*

_ **and Steven Nafziger**, "The Births, Lives, and Deaths of Corporations in Late Imperial Russia," 2017. Mimeo.

Grosfeld, Irena, Seyhun Orcan Sakalli, and Ekaterina Zhuravskaya, "Middleman Minorities and Ethnic Violence: Anti-Jewish Pogroms in the Russian Empire," *Review of Economic Studies*, 2018, *forthcoming.*

_ , _ , **and** _ , "Middleman Minorities and Ethnic Violence: Anti-Jewish Pogroms in the Russian Empire," *The Review of Economic Studies*, 01 2019. rdz001.

Harvey, Cole, "Changes in the menu of manipulation: Electoral fraud, ballot stuffing, and voter pressure in the 2011 Russian election," *Electoral Studies*, 2016, *41*, 105–117.

Hillmann, Henning and Brandy L. Aven, "Fragmented Networks and Entrepreneurship in Late Imperial Russia," *American Journal of Sociology*, 2011, *117* (2), 484–538.

Hsieh, Chang-Tai and Peter J. Klenow, "Misallocation and Manufacturing TFP in China and India," *Quarterly Journal of Economics*, 2009, *124* (4), 1403–1448.

Jha, Saumitra, "Trade, Institutions, and Ethnic Tolerance: Evidence from South Asia," *American Political Science Review*, 2013, *107* (4), 806–832.

Kahan, Arcadius, "Notes on Jewish Entrepreneurship in Tsarist Russia," in Gregory Guroff and Fred V. Carstensen, eds., *Entrepreneurship in Imperial Russia and the Soviet Union*, Princeton: Princeton University Press, 1983, pp. 104–124.

Krol', M.A., *Kak proshli vybory v Gosudarstvennuyu Dumu*, Tipo-lit. R.S. Vol'pina, Sadovaya 18, 1906.

La Porta, Rafael, Florencio Lopez de Silanes, Andrei Shleifer, and Robert W. Vishny, "Legal Determinants of External Finance," *The Journal of Finance*, 1997, *52* (3), 1131–1150.

Larreguy, Horacio, Cesar E. Montiel Olea, and Pablo Querubin, "Political Brokers: Partisans or Agents? Evidence from the Mexican Teachers' Union," *American Journal of Political Science*, 2017, *61* (4), 877–891.

Laverychev, V. Ia., *Krupnaia burzhuaziia v poreformennoi Rossii*, Moscow: Mysl', 1974. [In Russian: *Big business in Post-Reform Russia*].

Levin, E. B., *Sbornik ogranichitel'nykh zakonov i postanovlenii o evreiakh po 1-e iiulia 1902 goda*, St. Petersburg: Tipografiia M. M. Stasiulevicha, 1902. [In Russian: *A Collection of Restrictive Laws and Decrees on the Jews as of July 1, 1902*].

Löwe, Heinz-Dietrich, *The Tsars and the Jews: Reform, Reaction and Anti-Semitism in Imperial Russia, 1772–1917*, Harwood Academic Publishers, 1993.

Magaloni, Beatriz, *Voting for Autocracy: Hegemonic Party Survival and its Demise in Mexico* Cambridge Studies in Comparative Politics, Cambridge University Press, 2006.

Mares, Isabela, *From Open Secrets to Secret Voting: Democratic Electoral Reforms and Voter Autonomy* Cambridge Studies in Comparative Politics, Cambridge University Press, 2015.

_ **and Lauren Young**, "The Core Voter?s Curse: Coercion and Clientelism in Hungarian Elections," *Working Paper*, 2016.

_ **, Aurelian Muntean, and Petrova Tsveta**, "The Incidence of Economic Intimidation at Times of Elections: Evidence from Romania and Bulgaria," *Government and Opposition*, 2019.

Ministry of Internal Affairs, *Vybory v Gosudarstvennuyu Dumu Tretiyago Sozyva: Statisticheskiy otchet Osobago Deloproizvodstva*, Tipographiya Ministerstva Vnutrennikh Del, 1911.

Moscow City Council, *Vybory po g. Moskve v Gosudarsvennuyu Dumu Tretiyago Prizyva. Pechatano po rasporiazheniyu Moskovskogo Gorodskogo Golovy*, Gorodskaya Tipografiya, 1908.

Moshenskii, Sergei, *The Equity Market in the Russian Empire*, Moscow: Ekonomika, 2014. [In Russian: *Rynok tsennykh bumag Rossiiskoi Imperii*].

Nathans, Benjamin, *Beyond the Pale: The Jewish Encounter with Late Imperial Russia*, University of California Press, 2002.

Nefedova, Tatyana and Andrei Treivish, "Differential urbanisation in Russia," *Tijdschrift voor economische en sociale geografie*, 2003, *94* (1), 75–88.

Olson, Mancur, "Dictatorship, Democracy, and Development," *American Political Science Review*, 1993, *87* (3), 567–576.

Owen, Thomas C., *The corporation under Russian law, 1800–1917: A study in tsarist economic policy*, Cambridge University Press, 1991.

_ , "RUSCORP: A Database of Corporations in the Russian Empire, 1700–1914. 3d release," Ann Arbor, MI: Inter-University Consortium for Political and Social Research 1992.

Pallot, Judith, *Land Reform in Russia: 1906–1917: Peasant Responses to Stolypin's Project of Rural Transformation*, Oxford University Press, 1999.

Rajan, Raghuram G. and Luigi Zingales, "Financial Dependence and Growth," *American Economic Review*, 1998, *88* (3), 559–586.

Raskin, D., "The "Jewish problem" in the documents of supreme state institutions of the Russian Empire in the 19th – early 20th century," in D. Elyashevich, ed., *The history of the Jews in Russia. The problems of sources and historiography*, St. Petersburg: St. Petersburg Jewish University, 1993, pp. 60–76.

Reuter, Ora John, "The Politics of Dominant Party Formation: United Russia and Russia's Governors," *Europe-Asia Studies*, 2010, *62* (2), 293–327.

_ **and David Szakonyi**, "Online Social Media and Political Awareness in Authoritarian Regimes," *British Journal of Political Science*, 2015, *45* (1), 29–51.

Rieber, Alfred J., *Merchants and Entrepreneurs in Imperial Russia*, Chapel Hill, NC: The University of North Carolina Press, 1982.

Robertson, Graeme, "Political Orientation, Information and Perceptions of Election Fraud: Evidence from Russia," *British Journal of Political Science*, 2017, *47* (3), 589–608.

Rogger, Hans, *Jewish Policies and Right-Wing Politics in Imperial Russia*, University of California Press, 1986.

Rosenfeld, Bryn, "The Popularity Costs of Economic Crisis under Electoral Authoritarianism: Evidence from Russia," *American Journal of Political Science*, 2018, *62* (2), 382–397.

Rubinow, Isaac M., *Economic condition of the Jews in Russia*, New York: Arno Press, 1975. Reprint of the 1907 ed.

Rundlett, Ashlea and Milan W. Svolik, "Deliver the Vote! Micromotives and Macrobehavior in Electoral Fraud," *American Political Science Review*, 2016, *110* (1), 180–197.

Shepelev, Leonid E., *Aktsionernye kompanii v Rossii*, Leningrad: Nauka, 1973. [In Russian: *Joint-Stock Companies in Russia*].

_ , *Tsarism and burzhuaziia vo vtoroi polovine XIX veka: Problemy torgovo-promyshlennoi politiki*, Leningrad: Nauka, 1981. [In Russian: *The Monarchy and Bourgeoisie in the second half of the 19th century*].

_ , *Tsarism and burzhuaziia v 1904–1914 gg.: Problemy torgovo-promyshlennoi politiki*, Leningrad: Nauka, 1987. [In Russian: *The Monarchy and Bourgeoisie in 1904–1914*].

_ **, ed.**, *Sud'by Rossii: Doklady i zapiski gosudarstvennykh deiatelei imperatoram o problemakh ekonomicheskogo razvitiia strany (vtoraia polovina XIX v.)*, St. Petersburg: Liki Rossii, 1999. [In Russian: *Russia's fortunes*].

Simpser, Alberto, *Why Governments and Parties Manipulate Elections: Theory, Practice, and Implications* Political Economy of Institutions and Decisions, Cambridge University Press, 2013.

Solovyev, Kirill, *Samoderzhavie i Konstitutsiya. Politicheskaya povsednevnost' v Rossii v 1906–1917 godakh*, Moscow: Novoe Literaturnoe Obozrenie, 2019.

Staiger, Doug and James Stock, "Instrumental Variables Regression with Weak Instruments," *Econometrica*, 1997, *65* (3), 557–586.

Stock, James and Motohiro Yogo, *Testing for Weak Instruments in Linear IV Regression*, New York: Cambridge University Press, 2005.

Strumilin, Stanislav Gustavovich, *Istoriia chernoi metallurgii v SSSR*, Moscow: Nauka, 1954. [In Russian: *The History of Ferrous Metallurgy in the USSR*].

Szakonyi, David, "Candidate Filtering: The Strategic Use of Electoral Fraud in Russia," *SSRN Working paper*, 2019.

Treisman, Daniel, "Presidential Popularity in a Hybrid Regime: Russia under Yeltsin and Putin," *American Journal of Political Science*, 2011, *55* (3), 590–609.

Ulianova, Galina N., "Zakonodatelstvo o evreiakh v Rossiiskoi Imperii, 19 – nachalo 20 veka," in Boris V. Anan'ich, Dittmar Dahlmann, and Yurii A. Petrov, eds., *Chastnoe predprinimatelstvo v dorevolutsionnoi Rossii*, Moscow: Rosspen, 2010, pp. 314–332. [In Russian: *Entrepreneurship in Pre-Revolutionary Russia*].

Weitz-Shapiro, Rebecca, "What Wins Votes: Why Some Politicians Opt Out of Clientelism," *American Journal of Political Science*, 2012, *56* (3), 568–583.

Wooldridge, Jefrey M., *Econometric Analysis of Cross Section and Panel Data*, Mit Press, 2010.

Ziblatt, Daniel, "Does Landholding Inequality Block Democratization?: A Test of the 'Bread and Democracy' Thesis and the Case of Prussia," *World Politics*, 2008, *60* (4), 610–641.