Essays on the Historical Political Economy

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Summary

Chapter 1 In "**Enemies within the Gates: Evidence from Stalin's Ethnic Cleansing Campaigns**", I examine the forced deportation of 2.8 million Soviet citizens from the border areas of European Russia and the Far East to Central Asia and Siberia between 1937 and 1944. They belonged to nine distinct ethnic groups who were deported under the pretext of alleged treason against the Soviet Union. They were placed under a "special settler regime," not allowed to reside or move freely, and their working and living conditions were organized by the NKVD into special commandos. After Stalin's death, five of the nine deported ethnic groups were unexpectedly restored their civil rights and former state administrative and territorial status by a 1956 rehabilitation decree, while the other four continued to live in internal exile.

I use the exogenous allocation of "special settlers" and the 1956 rehabilitation decree as an instrument for the randomness of the rehabilitation to examine the differential distribution of skills among complementary local non-Slavic groups in terms of their educational and labor market success in the host and origin regions. I analyze Soviet census data from 1939 to 1989, divided into three submarkets, to track the spatial movement of permanently exiled and rehabilitated groups. Because the deportations were politically motivated, I also investigated whether the politically motivated deportations affected voting patterns in the 1991 referendum on Soviet Union membership and contributed to unrest in the late Soviet Union. My findings suggest that local non-Slavic groups in the host regions did not benefit from the "special settler regime," while the presence of rehabilitated groups in both regions had a positive impact on higher education and white-collar employment, especially in the origin regions. This indicates that the rehabilitated groups invested in education to protect themselves from future negative shocks. In addition, a deportation background in the origin regions predicts a stronger support for preserving the Soviet Union in the 1991 referendum. While rehabilitated ethnic groups are associated with lower protest behavior, permanently exiled individuals who escaped deportation in their origin regions show a significant increase in protest and unrest in the late Soviet Union. This effect is reversed for host regions.

Chapter 2 In "**Red Rage: Secret Policing & Political Divide in the Russian Empire**", Theocharis Grigoriadis and I examine the influence of the Okhrana, the world's first professional intelligence service, on political attitudes in the run-up to the Russian Revolution of 1917. We use previously unexplored data from the Paris branch of the Okhrana, collected by Theocharis Grigoriadis, covering the European part of Imperial Russia from the 1880s to the 1900s. Our dataset contains information on more than 1,700 individuals, including prominent figures of the Bolshevik Revolution such as Molotov, Stalin, and Trotsky. To assess the structure and activity of the Okhrana during this period, we create local indicators of the intensity of local repression and radicalization in Russian society. We then examine the impact of these measures on the results of the 1917 Constituent Assembly elections in more than 400 administrative districts. In this way, we can assess the impact of tsarist repression and local radicalization on political preferences without undermining the influence of the tsarist empire on universal suffrage.

We test the hypothesis that local radicalization and tsarist repression, as exercised by the Okhrana, drove polarization in Russian society and increased electoral outcomes for radical parties on both spectrums. We focus in particular on the Constitutional Democrats (Kadets), a classical-liberal party at the right end of the political spectrum, and examine whether the repressive measures of the Okhrana influenced the electoral outcome of the Kadets after the failed Kornilov coup of September 1917, which weakened the political power of the extreme right. We control for other potential factors influencing Russian political development, such as the integration of Jews in rural areas, land quality, and historically prevalent serfdom. Our results show that as local communities become more radicalized, voting preferences become more polarized. Moreover, the degree of local radicalization, as measured by Okhrana monitoring activities, has a significant impact on the popularity of right-wing parties, especially among moderate and far-right groups. Both left-wing and right-wing parties have benefited significantly from increased local radicalization, both in absolute and relative terms.

Chapter 3 In "**The Engineering of Consent: A Network Analysis of Belief Manipulation**", I present a theoretical model capturing on a unique period in East German postwar history characterized by the transition between two dictatorships with opposing ideologies. A small communist elite, composed mostly of former Nazi prisoners and exiles, was entrusted with the leadership of the Soviet Occupation Zone and later the GDR, while the majority of the population consisted of former Hitler sympathizers. By skillfully balancing competing interests, it created the first workers' and peasants' state on German soil. I examine the interplay between opinion manipulation and coercion within a social network in a dictatorship, focusing on horizontal and vertical socialization efforts. The resulting case study offers valuable insights into the emergence, evolution, and persistence of cultural traits in politically divided societies. In such societies, individuals initially hold opposing beliefs due to their position in the network structure, but monitor each other's actions. The main goal is to explain the persistence of traits in such societies and the time required to reach a steady state.

I use an overlapping generations model, linking prior beliefs and updated opinions through the structural features of the social network. Families, called dynasties, are embedded in this network of social interaction that cannot be abandoned or accept new members. Interactions among dynasties are continuous and they update their beliefs based on a simple rule of thumb. Dynasties influence each other indirectly through spillover effects on incentives and strategic externalities arising from hidden beliefs. A socialist planner is introduced to change individuals' incentives by implementing a centralized school system and social advancement mechanisms that reduce the extent of imperfect empathy among parents. By further dividing the social network into influence classes, I model a political socialist elite that serves as a guiding culture to influence political loyalties in the rest of the society. It follows that dynasties socialized in the old order are not only influenced by the new guiding culture, but also influence it themselves to some degree. As a result of this process, a social structure emerges that is characterized by a high degree of uniformity in terms of political traits and by perpetuating class characteristics.

Kurzfassung

Kapitel 1   In "**Enemies within the Gates: Evidence from Stalin's Ethnic Cleansing Campaigns**" untersuche ich die Zwangsdeportation von 2,8 Millionen Sowjetbürgern aus den Grenzgebieten des europäischen Russlands und dem Fernen Osten nach Zentralasien und Sibirien zwischen 1937 und 1944. Sie gehörten zu neun verschiedenen ethnischen Gruppen, die unter dem Vorwand des angeblichen Verrats an der Sowjetunion deportiert wurden. Sie wurden unter ein "Sondersiedlerregime" gestellt, durften sich nicht frei aufhalten oder bewegen, und ihre Arbeits- und Lebensbedingungen wurden vom NKWD in speziellen Kommandos organisiert. Nach Stalins Tod erhielten fünf der neun deportierten ethnischen Gruppen durch ein Rehabilitierungsdekret von 1956 unerwartet ihre Bürgerrechte und ihren früheren staatlichen Verwaltungs- und Gebietsstatus zurück, während die anderen vier weiterhin im internen Exil lebten.

Ich verwende die exogene Allokation von Sondersiedlern und das Rehabilitierungsdekret von 1956 als Instrument für die Zufälligkeit der Rehabilitierung, um die unterschiedliche Verteilung von Fähigkeiten unter komplementären lokalen nicht-slawischen Gruppen im Hinblick auf ihren Bildungs- und Arbeitsmarkterfolg in den Aufnahme- und Herkunftsregionen zu untersuchen. Dafür verwende ich Daten aus sowjetischen Volkszählungen zwischen 1939 und 1989, unterteile sie in drei Teilmärkte und untersuche die räumlichen Ströme von dauerhaft vertriebenen und rehabilitierten Gruppen. Da die Deportationen politisch motiviert waren, untersuche ich ebenfalls, ob sie das Abstimmungsverhalten beim Referendum von 1991 über den Verbleib in der Sowjetunion beeinflusst und zu Protesten und Unruhen in der späten Sowjetunion beigetragen haben. Meine Ergebnisse deuten darauf hin, dass die lokalen nicht-slawischen Gruppen in den Aufnahmeregionen nicht vom Sondersiedlerregime profitierten, während sich die Anwesenheit der rehabilitierten Gruppen in beiden Regionen positiv auf die Hochschulbildung und die Beschäftigung im Angestelltenbereich auswirkte, insbesondere in den Herkunftsregionen. Dies legt nahe, dass die rehabilitierten Gruppen in Bildung investierten, um sich vor zukünftigen negativen Schocks zu schützen. Ferner deutet ein Deportationshintergrund in den Herkunftsregionen auf eine stärkere Unterstützung für den Erhalt der Sowjetunion im Referendum von 1991 hin. Während rehabilitierte ethnische Gruppen mit einem geringeren Protestverhalten in Verbindung gebracht werden, zeigen dauerhaft exilierte Personen, die der Deportation in ihren Herkunftsregionen entkommen sind, einen signifikanten Anstieg von Protest und Unruhen in der späten Sowjetunion. Dieser Effekt kehrt sich für die Aufnahmeregionen um.

Kapitel 2   In "**Red Rage: Secret Policing & Political Divide in the Russian Empire**" untersuchen Theocharis Grigoriadis und ich den Einfluss der Okhrana, des ersten professionellen Nachrichtendienstes der Welt, auf die politischen Einstellungen im Vorfeld der russischen Revolution von 1917. Wir verwenden bisher unerforschte Daten der Pariser Zweigstelle der Okhrana, die von Theocharis Grigoriadis gesammelt wurden und den europäischen Teil des kaiserlichen Russlands von den 1880er bis zu den 1900er Jahren abdecken. Unser Datensatz enthält Informationen über mehr als 1.700 Personen, darunter prominente Persönlichkeiten der bolschewistischen Revolution wie Molotow, Stalin und Trotzki. Um die Struktur und Tätigkeit der Okhrana in diesem Zeitraum zu bewerten, erstellen wir lokale Indikatoren für die Intensität der lokalen Repression und Radikalisierung in der russischen Gesellschaft. Anschließend untersuchen wir die Auswirkungen dieser Maßnahmen auf die Ergebnisse der Wahlen zur Verfassunggebenden Versammlung von 1917 in mehr als 400 Verwaltungsbezirken. Auf diese Weise können wir die Auswirkungen der zaristischen Repression und der lokalen Radikalisierung auf die politischen Präferenzen beurteilen, ohne den Einfluss des Zarenreichs auf das allgemeine Wahlrecht zu untergraben.

Wir testen die Hypothese, wonach die lokale Radikalisierung und zaristische Repression, wie sie von der Okhrana ausgeübt wurden, die Polarisierung in der russischen Gesellschaft vorantrieben und die Wahlergebnisse für radikale Parteien in beiden Rändern erhöhten. Wir konzentrieren uns insbesondere auf die Konstitutionellen Demokraten (Kadetten), eine klassisch-liberale Partei am rechten Ende des politischen Spektrums, und untersuchen, ob die repressiven Maßnahmen der Okhrana das Wahlergebnis der Kadetten nach dem gescheiterten Kornilow-Putsch vom September 1917 beeinflussten, der die politische Macht der extremen Rechten schwächte. Wir kontrollieren für andere

potenzielle Faktoren, welche die politische Entwicklung Russlands beeinflusst haben könnten, wie beispielsweise die Integration der städtisch geprägten jüdischen Minderheit in ländlichen Gebieten, die Landqualität an sich und die historisch vorherrschende Leibeigenschaft. Unsere Ergebnisse zeigen, dass mit zunehmender Radikalisierung lokaler Gemeinschaften auch die Wahlpräferenzen stärker polarisiert werden. Darüber hinaus hat der Grad der lokalen Radikalisierung, der durch die Überwachungsaktivitäten von Okhrana gemessen wird, einen erheblichen Einfluss auf die Popularität rechter Parteien, insbesondere bei gemäßigten und rechtsextremen Gruppen. Sowohl linke als auch rechte Parteien haben von der zunehmenden lokalen Radikalisierung erheblich profitiert, sowohl in absoluten als auch in relativen Zahlen.

Kapitel 3 In "**The Engineering of Consent: A Network Analysis of Belief Manipulation**" stelle ich ein theoretisches Modell vor, das eine einzigartige Periode der ostdeutschen Nachkriegsgeschichte erfasst, die durch den Übergang zwischen zwei Diktaturen mit entgegengesetzten Ideologien gekennzeichnet war. Eine kleine kommunistische Elite, die sich hauptsächlich aus ehemaligen Nazi-Häftlingen und Exilanten zusammensetzte, wurde mit der Führung der Sowjetischen Besatzungszone und später der DDR betraut, während die Mehrheit der Bevölkerung aus ehemaligen Hitler-Sympathisanten bestand. Durch den geschickten Ausgleich konkurrierender Interessen schuf sie den ersten Arbeiter- und Bauernstaat auf deutschem Boden. Ich untersuche das Zusammenspiel von Meinungsmanipulation und Zwang innerhalb eines sozialen Netzwerks in einer Diktatur und konzentriere mich dabei auf horizontale und vertikale Sozialisierungsbemühungen. Die daraus resultierende Fallstudie bietet wertvolle Einblicke in das Entstehen, die Entwicklung und das Fortbestehen kultureller Merkmale in politisch gespaltenen Gesellschaften. In solchen Gesellschaften vertreten die Individuen aufgrund ihrer Position in der Netzwerkstruktur zunächst gegensätzliche Überzeugungen, überwachen aber die Handlungen der anderen. Das Hauptziel ist die Erklärung der Persistenz von Merkmalen in solchen Gesellschaften und der Zeit, die erforderlich ist, um einen stabilen Zustand zu erreichen.

Dazu modelliere ich ein überlappendes Generationenmodell, das frühere Überzeugungen und aktualisierte Meinungen durch die strukturellen Merkmale des sozialen Netzwerks miteinander verknüpft. Familien, Dynastien genannt, sind in dieses verwandtschaftliche Netzwerk sozialer Interaktion eingebettet, welches weder verlassen werden noch neue Mitglieder aufnehmen kann. Die Interaktionen zwischen den Dynastien sind kontinuierlich und sie aktualisieren ihre Überzeugungen auf der Grundlage einer einfachen Faustregel. Die Dynastien beeinflussen sich gegenseitig indirekt durch Spillover-Effekte auf Anreize und strategische Externalitäten, die sich aus verborgenen Überzeugungen ergeben. Ein sozialistischer Planer wird eingeführt, um die Anreize der Individuen zu verändern, indem er ein zentralisiertes Schulsystem und soziale Aufstiegsmechanismen einführt, die das Ausmaß der unvollkommenen Empathie unter den Eltern verringern. Durch eine weitere Unterteilung des sozialen Netzwerks in Einflussklassen modelliere ich eine politische sozialistische Elite, die als Leitkultur dient, um die politischen Loyalitäten in der übrigen Gesellschaft zu beeinflussen. Daraus folgt, dass Dynastien, die in der alten Ordnung sozialisiert wurden, nicht nur von der neuen Leitkultur beeinflusst werden, sondern diese auch bis zu einem gewissen Grad selbst beeinflussen. Als Ergebnis dieses Prozesses entsteht eine Sozialstruktur, die sich durch ein hohes Maß an Einheitlichkeit in Bezug auf politische Einstellungen und durch die Perpetuierung von Klassenmerkmalen auszeichnet.

Declaration

Ich erkläre hiermit gemäß § 10 Abs. (3) der Promotionsordnung zum Dr. rer. pol. des Fachbereichs Wirtschaftswissenschaft der Freien Universität Berlin vom 13. Februar 2013 , dass ich mich noch keinem Promotionsverfahren unterzogen habe oder um Zulassung zu einem solchen beworben habe. Darüber hinaus habe ich die Dissertation mit dem Titel "Essays on the Historical Political Economy" in der vorliegenden oder überarbeiteten Form keiner Prüfungskommission, keinem Fachbereichsvertreter und keiner anderen Fakultät einer anderen Universität zur Begutachtung vorgelegt. Ich habe bei der Erstellung dieser Dissertation verschiedene Hilfsmittel und Ressourcen verwendet, die ich im Folgenden aufführe:

1. Stata 17.0
2. T_EX Live 2023
3. EndNote 20.4
4. Microsoft Office 2016

Berlin (Germany), August 30, 2023

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Julia Zimmermann

Contents

Dedication

This dissertation is dedicated to the extraordinary women in my family, especially my great-grandmother Maria. Maria was born in 1908 into a peasant family in Potopy, then in Grodno Province in Imperial Russia. She lost her father in World War I, her husband in World War II, and in 1944 had to flee to the West from the Red Army with her two young daughters, one of whom was my grandmother. She ended up in a part of Germany that later became the Soviet Occupation Zone and then the German Democratic Republic. Maria died in unified Germany at the remarkable age of 99. Only now do I realize the extent of Maria's courage, her affection, and the profound impact her decisions had on my life today.

Acknowledgements

Introduction

In recent years, the field of economic history has undergone significant advancements in terms of econometric methodologies and digitization technologies. This has opened up a plethora of historical data for empirical investigation, prompting economists to delve deeper into history and develop better research frameworks through experimentation or quasi-experimental approaches. Furthermore, the opening of Soviet archives has provided rich and high-quality archival data and statistical volumes on the latter half of the 19th and early 20th century, particularly on Eastern Europe, making it an exciting time for economists to explore this region. In this context, economic historians are now better equipped than ever before to analyze the consequences of institutions, culture, and economic policies in shaping contemporary outcomes.

To explain the long-term implications of historical events, economic historians typically construct a "legacy"-type argument, consisting of three components: an outcome that contemporary causes cannot fully account for, a correlate that precedes the outcome, and possible links between the correlate and the outcome (Wittenberg 2015, p. 369). Numerous studies have explored the legacies of historical events, in particular, the effects of a single formative and often violent event in totalitarian regimes on subsequent political and social systems, including political participation and preferences, interethnic relations, economic enterprise, upward mobility, and public health. These studies examine various aspects, such as the impact of violent actions, the factors contributing to escalation or control, the methodologies used to measure long-term effects, the demographics affected, and the underlying reasons for these effects. Notable examples of such legacies include the effects of the Chinese Cultural Revolution (Wang 2019), anti-Semitic policies in Nazi Germany (Voigtländer and Voth 2015), the Ukrainian famine (Naumenko 2021; Zhukov and Talibova 2018), state-directed forced relocations after World War II (Becker, Grosfeld, et al. 2020; Braun and Kvasnicka 2014; Testa 2021), the mass resettlement of religious diasporas (Charnysh 2019), and the deportation of Crimean Tatars (Lupu and Peisakhin 2017).

The research exploring the lasting impact of historical events is exciting, but it also raises important questions. One of the most pressing questions is when a historical event becomes a "legacy." However, the research community is divided on this issue, with studies ranging from a few decades (Alesina and Fuchs-Schündeln 2007) to several centuries (Nunn and Wantchekon 2011). Estimating the specific mechanisms of historical events is challenging due to methodological difficulties such as selection and post-treatment biases. This is especially true when the effects may have spread to tens of thousands of people over several generations or centuries through networked interactions, socialization, and media. Additionally, identifying potential points of comparison is challenging when studying episodes of violence, particularly when they are as widespread and intense as World War II, which affected almost every region of the world. Moreover, even when causality can be convincingly demonstrated, it is not always clear why an effect occurs, making it difficult to draw conclusive policy recommendations. There is also much to learn about why some effects persist while others do not, and whether historical events lead to positive or negative changes. This theoretical gap explains why most research is empirical in nature and often does not distinguish between direct and indirect transmission of impacts through families, communities, and institutions (Walden and Zhukov 2020). Although empirical research is appropriate for some applications, it has made it challenging to understand how individual exposure spreads to the national level.

In this dissertation, I want to address some of these critical issues. Central is the idea that "empires do matter" and their influence persists long and simultaneously subliminally after their collapse through a lingering post-imperial syndrome. This syndrome promotes inward-looking ideologies, xenophobia, and a longing for past glories (as evidenced by the war against Ukraine). However, to understand the roots of these ideologies, it is essential to examine the historical context and factors that led to the actual decline of empires. My research therefore focuses on Eastern Europe and Russia, a region that experienced the collapse of two empires, the Russian Empire and the Soviet Union. It is also an extraordinary region where significant social experiments took place that impacted the population on a large scale. These include the abolition of serfdom, half-hearted liberalization reforms, the rise of the Bolsheviks

during the 1917 Revolution, the forced industrialization that transformed the Soviet Union into a global superpower at the cost of countless lives, and the spectacular collapse of the Soviet empire (Zhuravskaya et al. 2021, p. 1).

This dissertation is structured into three chapters, with two empirical chapters and one theoretical chapter. The first two empirical chapters investigate the political economy and labor market effects in the Russian Empire and the Soviet Union. However, it is challenging to make precise distinctions due to the ever-changing borders. The theoretical chapter offers a more nuanced understanding of the mechanisms of transmission and persistence through a comprehensive theoretical unpacking that focuses on the regime change from Nazi Germany to the German Democratic Republic, a state that was closely linked to the Soviet Union. Overall, my research examines the effectiveness of state and strategic decision-making processes in controlling specific populations through forced deportations, state surveillance, and targeted indoctrination. My goal is to provide a comprehensive understanding of the lasting effects of empires and the factors that contribute to their decline, using Eastern Europe and Russia as examples. In my analysis, Joseph Vissarionovich Dzhugashvili, also known as Stalin, appears repeatedly as a figure, playing a crucial role in every chapter, whether as a left-wing extremist and possible spy in the files of the tsarist secret police, as a dictator for whom ethnically motivated violence was a well-rehearsed part of governing, or as the string-puller of the German-German division.

Chapter 1 In the chapter "**Enemies within the Gates: Evidence from Stalin's Ethnic Cleansing Campaigns**", I delve into the forced deportation of 2.8 million Soviet citizens from the border areas of European Russia and the Far East to Central Asia and Siberia between 1937 and 1944. The purpose of this mass deportation was to remove nine distinct ethnic groups under the guise of alleged treason against the Soviet Union or as a preventive measure against future acts of treason. The Soviet government subjected them to a "special settler" regime, stripping them of residency status and freedom of movement, and the NKVD was tasked with organizing their working and living conditions in special commands. The deportees' attempts to escape resulted in permanent banishment from 1948 onwards. Stalin's death marked a turning point, with five of the nine deported ethnic groups unexpectedly regaining their civil rights and former state-administrative and territorial status in a 1956 rehabilitation decree. However, the remaining four groups, who were by far the largest group of deportees, continued to face marginalization, second-class citizenship, and internal exile until the collapse of the Soviet Union.

To examine the differential distribution of skills among complementary local groups and their educational and labor market success in the receiving and origin regions, I exploit the exogenous allocation of "special settlers" and use the 1956 rehabilitation decree as an instrument for the randomness of the rehabilitation. Specifically, I analyzed aggregate employment and education data from Soviet censuses from 1939 to 1989 and divided them into three submarkets, using spatial variations in the flows of permanently displaced and rehabilitated groups into or out of these submarkets. Moreover, as the deportations were primarily politically motivated, I examine the extent to which ethnic violence led to an increase in votes in the 1991 referendum on remaining in the Soviet Union and to more protests and unrest in the late Soviet Union. My findings reveal that local non-Slavic populations in the host regions did not benefit from the upstream complementarities or opportunities that resulted from the "special settler regime." The presence of rehabilitated groups in both origin and host regions had a strong positive effect on higher education and white-collar employment, although the effect was much stronger in the origin regions. This suggests that these groups hedged against future negative shocks by investing in higher education and advancing to higher positions over time. Additionally, a deportation background suggests stronger support for preserving the Soviet Union in the 1991 referendum. On the other hand, permanently exiled ethnic groups that escaped deportation in their origin regions show a significant 3.5 percent increase in protest and unrest in the late Soviet Union. This effect is reversed with nearly similar values for the host regions.

Chapter 1 contributes to the literature in several ways. First, it examines the effects of a complete population collapse in the origin regions, which differs from the artificial change in the social fabric that occurred in the host regions. This analysis tests the capital flight hypothesis proposed by Botticini and Eckstein (2005) and Becker, Grosfeld, et al. (2020) by analyzing the occupational and educational upgrading of rehabilitated ethnic groups and the local non-Slavic population. Second, this chapter contributes to research on the intergenerational effects of indiscriminate violence on nationality and identity, building on the work of Lupu and Peisakhin (2017) and Walden and Zhukov (2020). Finally, the chapter's spatial autoregressive model explicitly models the spatial extent of the

Soviet Union, providing a more nuanced understanding of the impact of forced migration and arbitrary violence on the economic and social outcomes of affected populations (Kelly 2019).

Chapter 2 In "**Red Rage: Secret Policing & Political Divide in the Russian Empire**" my PhD advisor Theocharis Grigoriadis and I address the influence of the Okhrana, the world's first professional intelligence service, on political attitudes in the run-up to the Russian Revolution of 1917. We utilize previously unexplored data from the Paris branch of the Okhrana, covering the European part of Imperial Russia from the 1880s to the 1900s. The dataset, collected by Theocharis Grigoriadis, contains information on more than 1,700 individuals, including prominent figures of the Bolshevik Revolution such as Molotov, Stalin, and Trotsky. To assess the structure and activity of the Okhrana during this period, we create local indicators for the intensity of both local repression and radicalization in Russian society. We then examine the impact of these measures on the electoral results of the 1917 Constituent Assembly in over 400 administrative districts, which we obtain from Protasov et al. (2014). Our focus on the Constituent Assembly elections allows us to assess the impact of tsarist repression and local radicalization on political preferences without the undermining influence of the tsarist empire on universal suffrage.

Specifically, we test the hypothesis that local radicalization and tsarist repression, as exercised by the Okhrana, drove polarization in Russian society and increased electoral outcomes for radical parties on both spectrums. We pay particular attention to the Constitutional Democrats party (Kadets), a classical liberal party in Russia at the other end of the political spectrum, and whether the repressive tactics of the Okhrana influenced the electoral outcome of the Kadets after the failed Kornilov coup of September 1917, which weakened the political power of the far right. We include replication data from Grosfeld, Sakalli, et al. (2020) mapping the integration of rural Jews and control for alternative explanations of Russian political development using data on land quality and the historical prevalence of serfdom from Buggle and Nafziger (2021). One of our main findings is that as a community becomes more radicalized at the local level, voting preferences become more polarized. Moreover, we find that the severity of local radicalization, as extracted by Okhrana's monitoring activities, has a significant impact on the popularity of right-wing parties, especially among moderate and far-right groups. In addition, increasing local radicalization significantly benefited left-wing and right-wing parties in both absolute and relative terms.

Chapter 2 adds to the literature on the rise of political extremism in the first half of the 20th century. While earlier studies focused primarily on right-wing political parties (Voigtländer and Voth 2021; Doerr et al. 2021), recent research has acknowledged the importance of left-wing extremism (Aidt and Jensen 2014; Castañeda Dower, Markevich, et al. 2021). We shed light on the rise of the radical left in comparison to the extreme right and show that maintaining public security is crucial for the stability of political systems, especially when they are subject to significant redistributive pressures (Keefer 2009). Repression can therefore influence public policy, resource allocation, and conflict resolution and make communities more vulnerable to nationalist mobilization and exclusionary appeals. We demonstrate how repression and radicalization can create opportunities for new political entrepreneurs and unpredictable change. Our study supports the thesis that harsh repression of dissent can contribute to the formation of distinct national identities, as argued by Gellner (2006) and Beissinger and Kotkin (2014).

Chapter 3 In "**The Engineering of Consent: A Network Analysis of Belief Manipulation**", I address a gap in the literature by developing a model that delves into a unique episode in East German history. This period was marked by a double dictatorship imprint and the transition between two regimes with opposing ideologies. It saw a small communist elite, mainly composed of former Nazi prisoners and exiles, leading the Soviet Occupation Zone and later the GDR amidst a mass of former Hitler sympathizers. The elite skillfully balanced competing interests to create the first worker's and peasant state on German soil. To gain a deeper understanding of this period, I examine the role of opinion manipulation and coercion within a social network under a dictatorship. My focus is on both horizontal and vertical socialization efforts. The resulting case study offers valuable insights into the emergence, development, and persistence of cultural traits over time. The primary objective of my model is to offer a rationale for the persistence of characteristics in politically divided societies. In such societies, individuals initially hold contrary beliefs owing to their position in the network structure but monitor each other's actions.

Using an overlapping generations model that links prior beliefs and updated opinions through the structural features of the social network (DeGroot 1974), I investigate the dynamics of belief formation in families, called dynasties, embedded in a family network of social interaction that cannot be abandoned and cannot accept new members. The interactions among dynasties are continuous, and they update their beliefs based on a simple rule of

thumb, as described in Gigerenzer and Kober (2007). To capture the impact of a socialist planner on belief formation, I introduce a centralized school system and social advancement mechanisms that reduce the extent of imperfect empathy among parents. Moreover, I divide the social network into influence classes to model a political socialist elite that serves as a guiding culture to influence the political loyalties of the rest of society. As a result, dynasties socialized in the old order are not only influenced by the new guiding culture but also influence it themselves to some degree. This process leads to the solidification of a social structure characterized by a high degree of homogeneity in political beliefs and in which class characteristics persist (Golub and Sadler 2016, p. 14; Kollmorgen 2005, p. 162). In other words, the socialist planner's efforts to change individuals' incentives and the influence of the political socialist elite create a self-reinforcing cycle that ultimately results in the persistence of cultural traits and the solidification of a particular social structure.

In Chapter 3, I contribute to the literature on the micro-mechanisms of culture and its persistence, with a particular focus on cases where political institutions are designed to directly influence the dynamics of opinion. Unlike previous work that has primarily examined the enforcement of preferred behaviors by emergent leaders, my analysis emphasizes the critical role that individuals' ability to decouple preferences and behavior plays in this process. This is consistent with the arguments put forth by Hoff and Sen (2005) and Akerlof (1976), which suggest that self-interested individuals may adhere to a social system that is harmful to them. In addition, my research expands the literature on decision making between individuals and different cultures in the context of a first and second generation of "regime migrants." Specifically, I examine social mobility, in which conforming behavior is necessary for advancement and is influenced by official indoctrination through a centralized school system that also influences parents' socialization decisions. This raises important questions about the effectiveness of schools as instruments of surveillance, the effects of rewards and punishments, and the link between private and public decisions. Overall, my research has significant implications for policymaking, as it can help explain Gorodnichenko and Roland (2020)'s findings that collectivist cultures, unlike individualist cultures, are more reluctant to rebel against a "good" autocrat who provides strong economic development. Furthermore, my analysis raises considerations about the durability of political legitimacy and how transitions can be impeded.

Conferences and symposia   I presented my research at several seminars and conferences to gain valuable feedback. These include: DENeB meeting 2018 in Berlin, the Social and Economic History Colloquium at Humboldt University 2021, the Institute for East European Studies' Research Club at Freie Universität Berlin 2021, X. ICCEES World Congress at Concordia University 2021 (online), 2022 ASREC April conference (online) at Chapman University in Orange, 2022 Annual Meeting of the Scottish Economic Society at the University of Glasgow, 2022 Annual Meeting of the Cliometrics Society at Vanderbildt University in Nashville (TN), 6th GCEG at Trinity College and University College in Dublin, Ninth CEPR Economic History Symposium at the University of Southern Denmark in Odense, 8th Annual Conference of the International Association for Applied Econometrics (IAAE) at King's College in London, 17th EACES meeting at Parthenope University of Naples, 8th Annual Meeting of the Danish and Scandinavian Economic Society at the University of Southen Denmark in Odense, CEECON 2022 at FU Berlin, NEUDC 2022 at Yale University in New Haven, ASEEES 2022 in Chicago, ASSA meetings 2023 in New Orleans, and the RES and SES joint annual conference in April 2023 at the University of Glasgow.

1 | Enemies within the Gates[*]

Evidence from Stalin's Ethnic Cleansing Campaigns

Abstract

This paper investigates the effects of the Soviet Union's forced deportation of 2.8 million citizens from nine ethnic groups between 1937 and 1944. These individuals were relocated to Central Asia and Siberia and placed under a "special settler regime" that deprived them of political and administrative rights and mandated the NKVD to organize their labor relations. Using the 1956 Rehabilitation Decree as an instrument for the randomness of the rehabilitation decision, this study examines the cross-effects of this quasi-experiment on the local labor market and education sector. The results suggest that the "special settler regime" did not provide any support for non-Slavic host region populations to advance in employment or education. However, rehabilitated ethnic groups experienced positive effects on higher education and white-collar employment in both host and origin regions. Additionally, the paper investigates whether ethnic violence resulted in an upsurge of votes in the 1991 referendum to stay in the Soviet Union, as well as more protests and unrest in the late Soviet Union. The findings indicate that individuals who were deported showed more support for preserving the Soviet Union, while rehabilitated groups exhibited reduced protest behavior. However, permanently exiled groups that evaded deportation from their origin regions experienced an increase in protests and unrest, an effect that is reversed in similar magnitude for the host regions. My findings remain robust even after accounting for education, employment, and historical violence.

JEL Classification: D74, E65, I25, N34, O11, P16, R12

1.1. Introduction

The Russian attack on Ukraine on February 24, 2022 has demonstrated the importance of understanding the historical developments in the post-Soviet space. Russian President Vladimir Putin's main argument is that many of today's post-Soviet states are not only historical zones of Russian settlement, but also artificial entities that were created by the Soviet administration and then gained their independence, often at great cost to Russian territory. This is as true of Abkhazia, Crimea, and the Donbass region as it is of northern Kazakhstan. Central Asia in general and Kazkahstan in particular, have always been a forced laboratory of imperial and Soviet nation-building, where Russian peasants who immigrated during the tsarist era were later joined by millions of forced deportees. To this day, these deportees connect biographies in the space between the Baltics and Ukraine, between the Caucasus and Central Asia. Nevertheless, there is a lack of knowledge about the long-term economic and demographic consequences of these large-scale deportations in both the regions of origin and the host regions.

I fill this research gap by examining the forced deportation of some 2.8 million Soviet citizens from Soviet border areas to the Central Asian and Siberian hinterlands between 1937 and 1944. The deportees belonged to nine distinct ethnic groups, each of which was deported in its entirety, either as punishment for treason they had (allegedly) committed against the Soviet Union or to prevent them from being tempted to commit such acts in the future.

Among them were Germans from predominantly European Russia or Ukraine, Karachay, Kalmyks, Ingush, Chechens, Balkans from the Caucasus, and Crimean Tatars from Crimea, who lost their national autonomy. In addition, Koreans from the Far East and Meskhetian Turks, who did not have their own national territory, were also deported. After their arrival in the hinterlands, these deported groups were placed under a "special settler regime," and they lost their residency status and freedom of movement. The NKVD was instructed to organize their employment and to place them in "socially useful work." Because of constant escape attempts, their banishment was made permanent from 1948 onward, which made them resemble common prison populations rather than ordinary Soviet citizens. Following Stalin's death, the fate of the Caucasian peoples unexpectedly turned when, in 1956, his successor Khrushchev restored their civil rights and their former state-administrative and territorial status. However, by far the largest group was condemned to second-class citizenship and internal exile until the collapse of the Soviet Union.

I investigate the long-term economic and political impacts of the special settler system by utilizing the exogenous allocation of "special settlers." To avoid endogeneity issues, I use the 1956 rehabilitation decree as an instrument to create exogenous variation in the rehabilitation status of the deported. The substantial disparities in the distribution of skills between locals, which include rehabilitated ethnic groups, and ethnic groups permanently in exile suggest possible effects on these complementary groups that could persist in the long run. Specifically, I examine whether, in host regions, persistent understratification by ethnic groups living permanently in exile has led to improved employment and educational opportunities for non-Slavic minorities through upstream complementarities. Non-Slavic populations are of particular interest as nationality policies in the 1920s established a gap between leadership positions and lower positions, with Russians dominating leadership positions, especially in Central Asia (Martin 2001, p. 387). Furthermore, I examine whether rehabilitated settlers who returned to their former homelands had better educational attainment and occupational status due to a change in preference for higher education. To test these hypotheses, I divide the employment and education data reported in the Soviet censuses from 1939 to 1989 into three submarkets and use the movement of permanently exiled and rehabilitated groups into or out of these submarkets as a means of identification while controlling for multiple dimensions of historical violence. Because the deportations were mainly politically motivated, I also investigate whether they resulted in increased secessionist voting during the 1991 Soviet Union referendum and more protests and unrest in the late Soviet Union among the descendants of "special settlers."

Previous studies on the impact of forced mass migration have shown that the disruption of social structures caused by such migration shock has significant effects on political attitudes, institutional, economic, and educational factors (Acemoglu, Hassan, et al. 2011; Grosfeld, Rodnyansky, et al. 2013; Akbulut-Yuksel and Yuksel 2015; Akbulut-Yuksel, Okoye, et al. 2020; Pascali 2014; Testa 2021; Bharadwaj and Mirza 2019). Furthermore, it affects academic performance (Waldinger 2010; Becker, Lindenthal, et al. 2020) and overall educational attainment of both the forced migrants and their descendants (Becker, Grosfeld, et al. 2020; Braun and Mahmoud 2014; Braun and Kvasnicka 2014; Braun and Dwenger 2020). For instance, Braun and Mahmoud (2014) investigate the situation of West German workers after the postwar influx of displaced persons from the former Nazi territories. Their results show a substantial decline in the employment of locals, which was more pronounced in regions with greater immigration. Similarly, Becker, Grosfeld, et al. (2020) study the compensatory migration from the Polish Kresy areas to the vacated former German areas. They observe that Poles with a history of migration were more likely to complete secondary education and ultimately have higher overall incomes. Overall, the existing evidence suggests that the effects of forced migration on human capital and employment are more long-term and comprehensive than those found in the related literature on physical capital destruction (Brakman et al. 2004; Miguel and Roland 2011; Redding et al. 2011).[1]

But despite the early Soviet economic policy's explicit goal of economic equality for all nationalities, its interaction with economic development has received little scholarly attention. While the Soviet Union, like other countries, suffered heavily from the aftermath of World War II, its reconstruction in Central Asia was achieved through the massive redistribution of production facilities and people (Mikhailova 2012). Despite the growing interest in Central Asia's historical development, research on the impact of nationality considerations during and after World War II on local production and national narratives and identities is still relatively scarce, except for a handful of innovative studies such as Jarotschkin et al. (2019), Castaneda Dower et al. (2021), and Suesse (2018). This paper fills this gap by analyzing the impact of the "special settler regime" on Central Asia and Siberia and demonstrating cross-connections based on observational data that were not influenced by assumptions about aggregate production technologies. Since

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[1] For a detailed literature review, see Becker and Ferrara (2019). Additionally, long-term demographic effects of the post-World War II relocation of the Sudetenland on internal migration are explored in Testa (2021) and Guzi et al. (2021).

the population transfer was so widespread, the deportation of these enemy ethnicities so exceptionally rapid, and the relocation that extremely swift, the analysis is well suited to investigate long-term effects on non-Slavic populations. Although the concept of deportations is not new to the Russian Empire and the Soviet Union, these ethnic based deportations are a peculiarity of World War II compared to World War I, when only "enemy nationals" were deported, i.e., nationals of the opposing power's hostile states. This time, the country's own citizens who shared the same ethnic background as the nationals of the enemy states were deported (Ther and Kreutzmüller 2014).

I find that the local non-Slavic population in the host regions did not benefit from upstream complementarities or opportunities arising from the "special settler regime" that would have enabled them to improve their occupational status or enjoy higher education. These results cannot be attributed to institutional inertia in the five-year plans or to a mismatch between the technical and cultural skills of Russian and non-Russian locals in the highest skill category for which I control. For the rehabilitated ethnic groups, I find a strong positive effect of their presence on higher education and white-collar employment in both origin and host regions, with a much stronger effect in the origin regions. On the one hand, this suggests that they have hedged against future negative shocks by investing in higher education. On the other hand, it also suggests that they were able to capitalize on their higher education and move up to higher positions over time. More generally, a deportation background tends to predict higher support for preserving the Soviet Union in the 1991 referendum. For the origin regions, this suggests that the deportation of these ethnic groups and their subsequent rehabilitation may have fostered an ethnic self-confidence among their descendants aimed at preserving the autonomy they had gained, in conjunction with a dramatic opening of political space during the Gorbachev government. While rehabilitated ethnic groups are associated with lower protest behavior, permanently exiled ethnic groups that escaped deportation in their origin regions predict a significant 3.5 percent increase in protests and unrest in the late Soviet Union, which is reversed with similar values for the host regions.

With this project, I make several contributions to the literature. Firstly, I contrast a complete population collapse in the origin regions as in Acemoglu, Hassan, et al. (2011) with an artificial change in the social fabric of the host regions, which were reversed for some ethnicities by the 1956 rehabilitation decree. This allows for testing the hypothesis of an occupational and educational upgrading for rehabilitated ethnicities (Botticini and Eckstein 2005; Becker, Grosfeld, et al. 2020; Sarvimäki 2011), who were able to return to the origin regions, and for the local population, which was become understratified by influx of the permanently exiles (Peri and Yasenov 2019; Borjas 2017). Secondly, I contribute to the literature on the intergenerational effects of indiscriminate violence on nationality and identity following Lupu and Peisakhin (2017) and Walden and Zhukov (2020). Related is the study by Jarotschkin et al. (2019), who study gender norm diffusion and compares regions that absorbed more Protestant Volga Germans with regions that absorbed more Muslim deportees. They observe that gender norms spread more among the local Russian population in regions that predominantly absorbed ethnic Germans. Similarly, Suesse (2018) shows that income inequality, rather than ethnicity, was among the drivers of secession movements in the late Soviet Union. Thirdly, I contribute methodologically by explicitly modeling the spatial extent of the Soviet Union within a spatial autoregressive model (Kelly 2019). I test various specifications against each other, that include different types of spatial lags and use a battery of tests, including Bayesian posterior probabilities testing, to confirm my model selection process. This allows for a more nuanced understanding of the effects of indiscriminate violence on the outcomes of affected populations.

The paper is organized as follows: Section 1.2 provides information on the timing and implementation of the forced deportation campaigns. Section 1.3 illuminates on my hypotheses and proposed channels. In section 1.4, I describe my available data and discuss their advantages. The subsequent section 1.5 delves into the methodology used, after which section 1.6.2 presents the results for host regions and section 1.6.1 for origin regions. I conclude in section 1.7.

1.2. Historical background

1.2.1. Ethnic cleansing campaigns

Diaspora nations

The increasing threat on both the western and eastern borders of the country prepared the ground for the deportation of entire ethnic groups. In the West, the racial doctrine of Nazi Germany challenged Soviet ideology, while in the East, the imperial ambitions of the Japanese Empire manifested themselves in the occupation of Manchuria. These

developments confirmed the Soviet Union's fear of being encircled by "imperial" and "capitalist" forces and raised doubts about the loyalty of members of its national minorities and whether they could ever truly become genuine Soviet citizens who did not pose a threat of homegrown terrorism of which they were suspected (Hirsch 2014, p. 273).

This represented an "empire change of mind" as the Soviet Union, from the mid-1920s to the early 1930s, aimed to unify the "backward" regions of the former Russian Empire through industrialization, urbanization, secularization, elimination of illiteracy, and territorial self-government. It considered its Western national minorities such as Germans, Poles, and Finns to be culturally advanced, while Russians, Belarusians, and Ukrainians were considered less advanced. Other groups were classified as "culturally backward" based on factors such as low literacy rates, limited access to education in their vernacular languages, lack of written language with developed literary language, social norms that oppressed women, religious fanaticism, nomadism, racial hostility, blood feuds, and the absence of national cadres (Martin 2001, p. 126).[2] In 1932, a considerable number of individuals from non-Russian ethnic groups had joined the Soviet bureaucracy and party, which allowed for titular nations to gradually take political control of their respective territories.[3] Subsequently, by 1939, these titular nations were overrepresented in party leadership positions and in the cultural sector. However, they remained underrepresented in managerial positions and technical fields, which continued to be dominated by Russians, thus creating a gap between higher-level and lower-level positions, particularly in Central Asia (Martin 2001, p. 387).

While until the early 1930s, the nation policies aimed to boost national self-confidence among non-Russian minorities, the mid-1930s saw carefully managed campaigns to ethnically "cleanse" major cities, borders, and border regions of "socially dangerous" elements (Polian 2004, p. 93; Martin 2001). The first group of victims were 172,000 Koreans from the Far Eastern border areas who were deported to Central Asia in 1937. About 95,000 Koreans were settled in northern Kazakhstan, while the rest were distributed among Uzbekistan and other Central Asian republics. The Germans were the first to be deported for collective treason at the outbreak of World War II. By early 1942, some 800,000 people had been expelled from European Russia and distributed evenly among Kazakhstan and Siberia. To meet wartime needs, Germans and other ethnic groups were demobilized from the Red Army and drafted into so-called labor armies, which in a short time initiated another phase of deportations (Chebykina 1999, p. 120).

"Special settlers"

Ethnic Germans were also the first to be officially considered "special settlers". This status was regulated in two decrees on the special settlement regime for nationalities in the USSR on January 8, 1945, and formed the basis until 1956, when some of the later deported ethnic groups were to be rehabilitated. While it not only limited their legal status as "special settlers" compared to other Soviet citizens, it also required them to perform "socially useful work". It further gave the NKVD the authority to organize the deportees' labor relations in so-called special commands and the responsibility to punish violations of labor discipline. While common USSR citizens also had to perform "socially useful work" or face legal penalties, the NKVD played no role in scouting and arranging employment. It is therefore the NKVD's prominent position in organizing "special settlers" that brought oppressed ethnic groups closer to prisoners than to free citizens in terms of status (Pohl 2016, pp. 300). "Special settlers" were further forbidden to leave their assigned settlement areas without permission from the NKVD, and violators were punished with fines of either one hundred rubles or up to five days in jail. Moreover, the heads of all settler families were required to inform their special commander within three days of all births, deaths, escapes, and the status of members of their immediate family (Polian 2004, pp. 182; Pohl 2016; Zemskov 2005).

In 1945 and 1946 and after the withdrawal of the German army, Soviet citizens of German origin, who had evaded deportation because they resided in the territories militarily occupied by Nazi Germany, were likewise forcibly repatriated. The forced repatriation was carried out with the help of American and British forces and in accordance with the Yalta agreements. By NKVD Directive No. 181 of October 11, 1945, all repatriated Germans automatically received the legal status of "special settlers" and were subject to the jurisdiction of the special commands (Pohl 2016, pp. 300). Later, these decrees were extended to ethnic Germans with Soviet citizenship living in the territories reconquered by the Soviet Union and to "local" Germans in Central Asia, adding another 231.3 thousand to the

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[2]   Table A.3.1 and Table A.3.2 in the Appendix show the 1926 literacy rate and the group of backward nationalities according to the "Uniform Guideline for Assignment to Culturally Advanced and Backward Ethnic Groups" of 1932, which is roughly based on the 1916 literacy rate.

[3]   See Figure A.2.1 for map on titular nations in their respective territories.

800,000 who had already been deported in 1942. The "special settler" status of ethnic Germans was then extended to all ethnic groups deported after 1942 (Zemskov 2005; Pohl 2016). Interestingly, although Koreans were designated as "special settlers" by the NKVD and the Council of People's Commissars, they were not legally classified as such. Moreover, unlike later deportations, they were compensated to some extent for travel expenses, left behind crops, buildings, and equipment, and received real estate loans (Polian 2004).

Deportation

Professionalization   In the course of the German withdrawal of 1943-44, the charge of enemy collaboration was extended to 70,000 Karachais (1943), 123,000 Kalmyks (1943), 484,000 Chechens and Ingush (1944), 40,000 Kabardians and Balkars (1944), 182. 000 Crimean Tatars (1944), and between 92,000 and 116,000 Meskhetian Turks (1944), all of whom were deported with unprecedented speed, professionalism, and brutality (Martin 1998, p. 820; Polian 2004, p. 327). The deportation of the Kalmyks was carried out in two waves on December 28 and 29, 1943, by 2,975 NKVD officers and the 3rd NKVD Vehicle Regiment, who were also involved in the earlier Karachay action. In this first wave, 93,000 people were deported, and between May and June 1944, another 30,000 were added, so that by June 4, 1944, the NKVD had succeeded in forcibly resettling almost the entire Kalmyk population of the USSR in special settlements in Siberia (Pohl 2000, p. 282; Bugai 1995, p. 79). The 1944 deportation of Chechens drew on the expertise of nearly 19,000 senior NKVD, NKGB, and SMERSH personnel, as well as 100,000 NKVD soldiers from across the country for this "highland exercise" (Bugai 1995, p. 107).[4] Between February 23 and March 1, 1944, 393,000 Chechens and 91,000 Ingush were transported by train to Central Asia. In addition, 4,000 NKVD leaders and 17,000 NKVD soldiers were involved in the expulsion of the Balkars, underscoring the massive professionalization in terms of personnel and logistics. By March 11, 1944, 38,000 Balkars had been expelled and sent to Kyrgyzstan (60%) and Kazakhstan (40%). In May and June 1944, another 2,000 Kabardians were sent into exile (Polian 2004, p. 151). The deportation of 182,000 Crimean Tatars in May 1944 was similarly well organized, and within three days a total of 47,000 families were taken to Uzbekistan (Bugai 1995, p. 156). In addition, within three days, beginning on November 15, 1944, between 90 and 116 thousand Meskhetians, Turks, Kurds, and Khemshins were deported (Polian 2004, p. 156).

Reception   However, the professionalization of the reception of deportees in the host regions often fell short of expectations. Although Koreans were not considered "special settlers" in the strict legal sense, they were treated as such and faced extreme weather conditions, neglect, and lack of support from local authorities upon arrival in host areas. Similarly, the Kalmyks were forced into overcrowded, unheated, and unsanitary cattle cars, resulting in epidemic outbreaks of diseases such as typhoid, tuberculosis, dystrophy, and others. The Kalmyks also suffered from lack of shelter, food, clothing, and other necessities of life, and many of them were initially housed in makeshift shelters (Pohl 2000, p. 282; Polian 2004, p. 156). For the North Caucasian highlanders, adapting to the unfamiliar conditions in predominantly flat Kazakhstan and Kyrgyzstan was also a challenge; they too suffered from lack of food, medicine, and shelter, as well as miserable living conditions that also resulted in thousands of deaths (Pohl 2000, p. 284; Bugai 1995, p. 79). As more Chechens, Ingush, and Balkars joined the Karachays, the housing shortage for the "special settlers" increased, and the deadly conditions in the special settlements decimated the North Caucasian exile population significantly within a year. Overall, from 1944 to the end of 1950, the NKVD and MVD recorded 163,790 deaths (28.7 percent of the population) among North Caucasian "special settlers" in the special settlements (Pohl 2000, p. 285).[5] The Crimean Tatars also suffered from the unhealthy climate in Uzbekistan, where poor material conditions, unclean water, and sweltering heat led to massive disease outbreaks, including yellow fever and malaria epidemics that struck the Crimean Tatar special settlers in the Namagan, Samarkand, and Bukhara areas in July 1944 (Pohl 2000, p. 286). The Meskhetian Turks, Kurds, and Khemshils were in a similarly challenging situation, and on January 15, 1945, the head of the NKVD in Uzbekistan reported that 8,000 deportees (15%) from Georgia lacked adequate food, clothing, and footwear. Their housing in overcrowded and unsanitary buildings, as with the Kalmyks, led to repeated outbreaks of typhus and typhus fever. Disease, exposure, and malnutrition led the NKVD-MVD to record 19,047 (20%) deaths among Georgian Muslims between 1945 and 1950 (Pohl 2000, p. 287).

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[4]   NKGB: People's Commissariat for State Security; SMERSH: Main Counterintelligence Department.

[5]   In 1944 alone, the NKVD recorded 58,787 North Caucasian deaths in the special settlements. By July 1948, this number had risen to 144,704, exceeding the number of registered births in exile in every year between 1944 and 1949.

Forever settlement

In order to combat the recurring escape attempts of "special settlers" from their assigned settlements, the Soviet government decreed their permanent banishment ("navechno") on November 26, 1948, and provided that any escape attempt would be punished with a draconian pfenalty of twenty years of hard labor (Pohl 2000, p. 286).[6] In addition, aiding and abetting "special settlers" to escape was sentenced to five years in prison, thus condemning future "settler" generations to second-class citizenship and permanent internal exile. In 1945, 967,085 families or 2,342,506 persons were registered as special settlers, which in 1959 represented 1.47% of the country's total population. Between 1945 and 1953, the number of special settlers grew 1.39 times in Western Siberia, 1.59 times in Eastern Siberia, and 3.28 times in the Far East. The share of "special settlers" in the total population was highest in Kazakhstan, 49.7% in 1945 and 52.9% in 1954 (Polian 2004, pp. 185). Ethnic Germans were settled in Kazakhstan (52.4% in Karaganda and Akmolinsk oblasts) and in the krajs and oblasts of Siberia (groups of 50 to 100 thousand people in Novosirbirsk and Altai). It was also the main destination for Chechens (77.2%), Ingush (96.8%), Karachay (65.4%) and Balkars (50.6%). Crimean Tatars, Koreans, and Meskhetian Turks formed the majority in Uzbekistan, while Chechens, Germans, Karachays, and Meskhetian Turks took the corresponding places in Kyrgyzstan (Polian 2004, p. 193).

Figure 1.1 illustrates the spatial distribution of deported groups on the eve of their deportation and in the host regions. Deported ethnicities became absent in all oblasts west of Moscow and in the border regions of Murmansk oblast, Kamchatka oblast, Primorskiy kray, the North Caucasus, and the lower Volga region.[7] Conversely, a massive change in ethnic composition is observed in the Central Asian and Siberia in response to the influx of these groups.

Figure 1.1.: Pre- and post-deportation spatial distribution of targeted ethnicities (in thousands)

(a) On the eve of deportation 1939

(b) In the host regions 1953
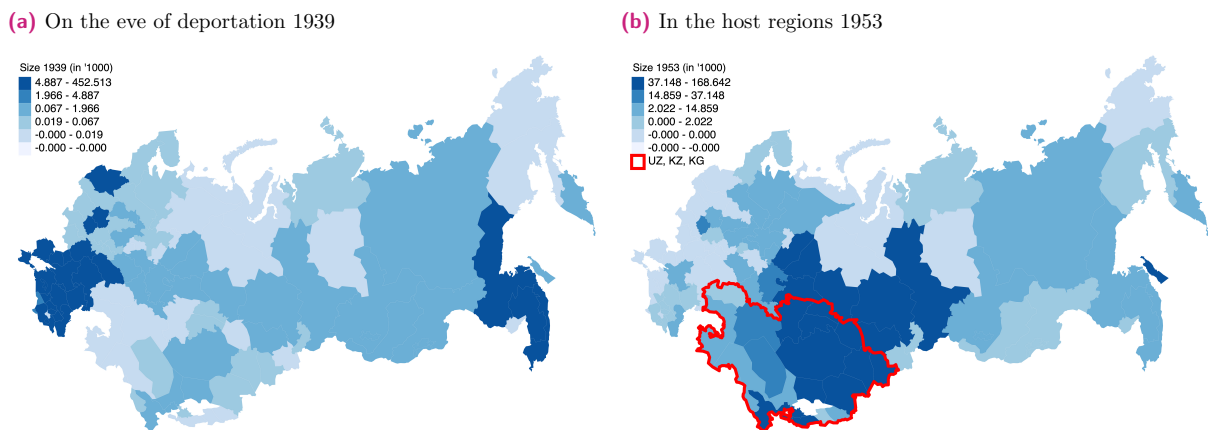
On a macroeconomic level, the deportations proved detrimental, ripping millions of long-established and economically productive families out of their production cycle and leaving entire areas and numerous settlements abandoned and neglected. Apart from transportation and resettlement costs, they caused a dramatic decline in agricultural and industrial production and led to the loss of labor and traditional practices of the population. In the host regions, Kalmyks were forced to work in agriculture, logging, and industrial fishing, despite having centuries of experience in livestock production. Similarly, Chechens and Ingush who had previously worked in the petroleum sector worked as highlanders at plants in Gurev' oblast in predominantly flat Kazakhstan. In addition, deportees from more urbanized border regions, such as ethnic Germans, were resettled mostly in rural areas (Pohl 2000, p. 271).[8]

Origin regions

Russification In the course of the deportation of the titular nations, the Soviet government dissolved or restructured the administration of the formerly autonomous areas and Russianized the place names to erase the cultural and

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[6] As of October 1, 1948, of the 2,104,751 registered special settlers, 77,451 had fled, while 20,955 were still in hiding; Germans, although the largest group among the fugitives, constituted only 2.2% of the total ethnic group (Polian 2004, p. 181).

[7] All choropleth maps shows the following boxplot distributions: $[\min, p25 - 1.5\text{iqr}], (p25 - 1.5 \times \text{iqr}, p25], (p25, p50], (p50, p75], (p75, p75 + 1.5 \times \text{iqr}],$ and finally $(p75 + 1.5 \times \text{iqr}, \max]$, where iqr = interquartile range.

[8] Soviet authorities were aware of the disastrous consequences of the deportation of kulaks to the same areas in 1930-31, where hundreds of thousands died of debilitation due to poor material conditions, malnutrition, and disease (Pohl 2000, p. 271).

linguistic identities associated with the various ethnic groups. The Volga German ASSR was dissolved and incorporated into the Stalingrad and Saratov oblasts. Similarly, the autonomous Karachay oblast was dissolved, its administrative structures dismantled, and the territory divided between the Stavropol and Krasnodar regions and the Georgian SSR, whereupon all place names were renamed (quoted from Bugai and Gonov (1998) Polian 2004, p. 130). The Chechen-Ingush ASSR was also dissolved, and its western and southern districts were incorporated into the Georgian SSR and North Ossetia, respectively. The eastern and southeastern districts were merged with Dagestan, while a new Grozny district (later Grozny oblast) was established in the Stavropol region, effectively dissolving the Chechen-Ingush Autonomous Soviet Socialist Republic (ASSR) on March 7, 1944 (Polian 2004, p. 146). The relocation of cleared territories by other ethnic groups, such as the Ossetians from Georgia to the cleared Ingush territories, also served as a tool for the russification of toponyms (Polian 2004, p. 146). Similarly, in Crimea, a decree of October 20, 1944, ordered the russification of all settlement, mountain, or river names of Tatar or German origin, along with the demotion of the Autonomous Republic of Crimea to an oblast of Crimea within Soviet Russia. In addition, the Karbadian-Balkar ASSR was renamed the Kabardian ASSR by an order of the Presidium of the Supreme Soviet on April 8, 1944, which contributed to the linguistic extermination of the Balkars (Polian 2004, p. 153).

Compensatory migration   The issue of compensatory migration in the cleared areas became critical with the deportation of Koreans and Volga Germans. The latter had been deported during the harvest season and led to a significant decline in grain production, which was to be compensated by the (forced) relocation of the neighboring legal population or front-line refugees. Although about 4/5 of the required labor force had been resettled by the summer of 1942, the 1942 harvest reached less than 1/3 of the planned amount, and the winter of 1942/43 passed largely without food. When the German army withdrew, the front-line refugees also returned, making this compensatory migration rather short-lived. In March 1944, another 19,600 families were resettled, but only 4,200 of them stayed, so that only about 37% of the households resettled between September 1941 and May 1945 remained permanently. In the former Chechen-Ingush ASSR, about 10,200 households were resettled by May 1945, compared with 28,375 households before the expulsion. As a result, agriculture, especially livestock farming on the extensive pastures and terrace cultivation in the highlands, suffered great damage. The livestock left behind were later deported to collective farms in the Ukrainian SSR, Stavropol Region, Voronezh, Kursk, and Orel, resulting in great losses (Polian 2004, p. 158). Compensation for the Crimean Tatars was also unsatisfactory: in September and October 1944, more than 17,000 collective farm workers arrived from other parts of Ukraine to fill the economic void left by the deportees. These replacement migrants, however, lacked the skills necessary for activities such as cattle raising, viticulture, and tobacco growing that had flourished during the Crimean Tatar period. As a result, the welfare of the 65,000 new Crimean residents was threatened, leading to a massive exodus in the spring of 1945. By April 1946, 11,381 families had left Crimea again despite generous government incentives. Thus, by July 1, 1948, 52.5% of the families who had come to Crimea since 1944 had left. Similar cases of economic vacuum occurred elsewhere, with Saratov and Crimea experiencing the largest outflow of compensatory migrants in the 1950s (Polian 2004, p. 162).

1.2.2. The 1956 Rehabilitation Decree

The fortunes of a number of ethnic groups would change under Khrushchev's thaw, restoring their civil and political rights as well as their state-administrative and territorial status.[9] During a secret speech at the 20th Communist Party Congress on February 24-25, 1956, Khrushchev referred to the deportations as "mass repressions" and conceded that they had not been dictated by military considerations (Conquest 1960, p 133). Ethnic Germans became one of the first to be removed from the register by a Council of Ministers decree of November 24, 1955, entitled "On the Removal of Certain Categories of Special Settlers from the Register," and were acquitted of charges of collective treason on December 13, 1955. This acquittal, however, neither overturned their convictions nor allowed them to seek compensation for property rights seized during the deportation. Since charges of collective treason were not dropped until 1964, the acquittal served to legitimize their place of exile (Pohl 2008, p. 411; Polian 2004, p. 202).

Following a Supreme Court rehabilitation decree of April 18, 1956, five deported ethnic groups were restored their statehood and autonomy, including (implicit) return assistance. This included the Chechens, Ingush, Balkars, Karachays, and Kalmyks, but not Crimean Tatars, Meskhetian Turks, Koreans, and Germans, who were by far the

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[9]   Although under Brezhnev repressive episodes again occurred, milder punishments or exile were generally preferred as penalties for dissent under Khrushchev (Zhukov and Talibova 2018, p. 270).

largest group (Polian 2004, p. 195). On October 31, 1957, an ambiguous decree on the situation of Meskhetian Turks, Kurds, and Hemshinli (Armenian Muslims) gave them the right to become official citizens of the Caucasus Republic of Azerbaijan, a country culturally close to their Muslim identity and geographically close to their Georgian homeland, which was now part of Georgia but claimed by only about 40,000 people (Tournon 2009).[10] In the following, I distinguish the deported ethnic groups into two groups along their freedom of movement stipulated in the 1956 and 1957 rehabilitation decrees, respectively:

1. Rehabilitated – Karachays and Balkars who were fully or at least satisfactorily rehabilitated; Chechens, Ingush, and Kalmyks who were partially rehabilitated (fully rehabilitated with respect to their civil rights).

2. Permanently exiled – ethnic Germans and Crimean Tatars, whose rehabilitation included the restoration of their civil and political rights but did not include the renewal of their state administrative and territorial status or a return option to their former homelands. It further includes the de facto exiled Koreans and Meskhetian Turks, who largely remained in exile despite the possibility of becoming citizens of Azerbaijan.

The discriminatory nature of the 1956 rehabilitation decree, as well as the timing of its enactment, only eight years after the exile of the ethnic groups concerned had been declared forever, underpin the randomness of this rehabilitation "shock".[11] Figure 1.2 shows the geographic distribution of permanently exiled and rehabilitated ethnic groups on the eve of their deportation in 1939 and in the host region in January 1953, when the "special settler regime" reached its peak. While the rehabilitated ethnic groups were deported to all Central Asian republics but not to Siberia, the permanently displaced were settled mainly in northern Kazakhstan and Siberia.

Figure 1.2.: Post-deportation spatial distribution of targeted ethnicities in 1953 (in thousands)

(a) Rehabilitated ethniticies

(b) Permanently exiled ethnicities
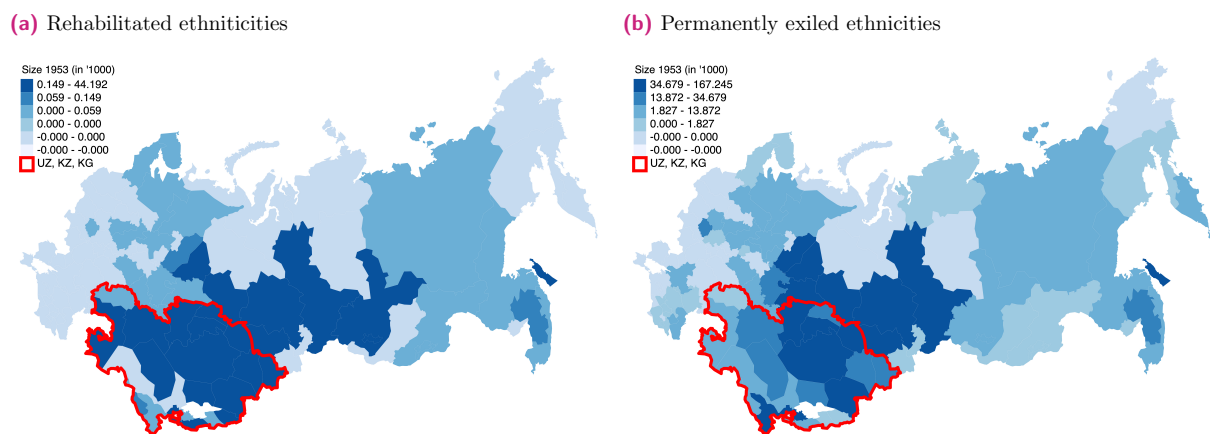
1.2.3. Post-rehabilitation

Beginning in the late 1950s, most of the fully or partially rehabilitated ethnic groups returned to their former homelands. While the Karachays and Balkars led the way with a return rate of over 80% as early as 1959, the return of the Kalmyks (61.2%), Chechens (58.2%) and Ingush (45.3%) was slower due to a delayed process of territorial restoration. In contrast, the number of ethnic Germans in Central Asia grew significantly into the thousands between 1953 and 1989: in Kazakhstan alone from 587.8 to 957.5 thousand, making this ethnic group the fourth largest in 1959 and the third largest in 1989 (Polian 2004, p. 192).[12] At the same time, 17 thousand remained in Saratov oblast and 14 thousand in Volgograd oblast (formerly Stalingrad) (Polian 2004, p. 192). Although the Germans (and Crimean Tatars) appeared to be better rooted than other ethnic groups, in reality the authorities were extremely cautious about disturbing the status quo (Polian 2004, p. 201). Because of their continuing importance to the

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[10] In the early 2000s, the majority of about 290 thousand Meskhetian Turks continued to live in Kazakhstan (about 80 to 100 thousand), followed by Russia (50 to 70 thousand), Azerbaijan (40 to 60 thousand), and finally Kyrgyzstan (25 to 30 thousand) and Uzbekistan (15 to 20 thousand) (Polian 2004, p. 220).

[11] Nonetheless, Chechens, Ingush, Kalmyks, Karachays and Balkars, and finally Meskhetian Turks may have been of rather limited strategic importance, since their former homelands were within Soviet administrative boundaries, but the homelands of the permanently exiled ethnic groups were not.

[12] Kyrgyzstan (15.8 to 101.3 thousand) and Uzbekistan (8.4 to 39.4 thousand) (Polian 2004, p. 192).

economic development of the origin regions, even more intensive assimilation of these groups through cultural and linguistic assimilation and selective exclusion from higher education became Soviet goals (Pohl 1999, p. 58; Pohl 2008, p. 411). Already during the special settlement regime, ethnic Germans were subject to a ban on German-language publications and education, which was only half-heartedly relaxed thereafter, leading to a decline in reported native German speakers from 67% in 1970 to only 57% in 1979 and 51% in 1989 (Polian 2004, p. 193).[13] In addition, only 4.3% of ethnic Germans had a college degree, compared with 11.7% of the total population of the republics. Individuals over the age of fifteen with post-secondary education accounted for only 5.7%, while 22.4% did not have a secondary school diploma and 8.4% did not have a high school diploma (Polian 2004). Figure 1.3 illustrates the population of rehabilitated and permanently exiled ethnicities in the regions of origin and host regions over time.

Figure 1.3.: Consequences of the 1956 rehabilitation decree over time, both regions

1939, 1959-1989: All-union census; 1953: Zemskov(2005).
Exact numbers not shown for readability
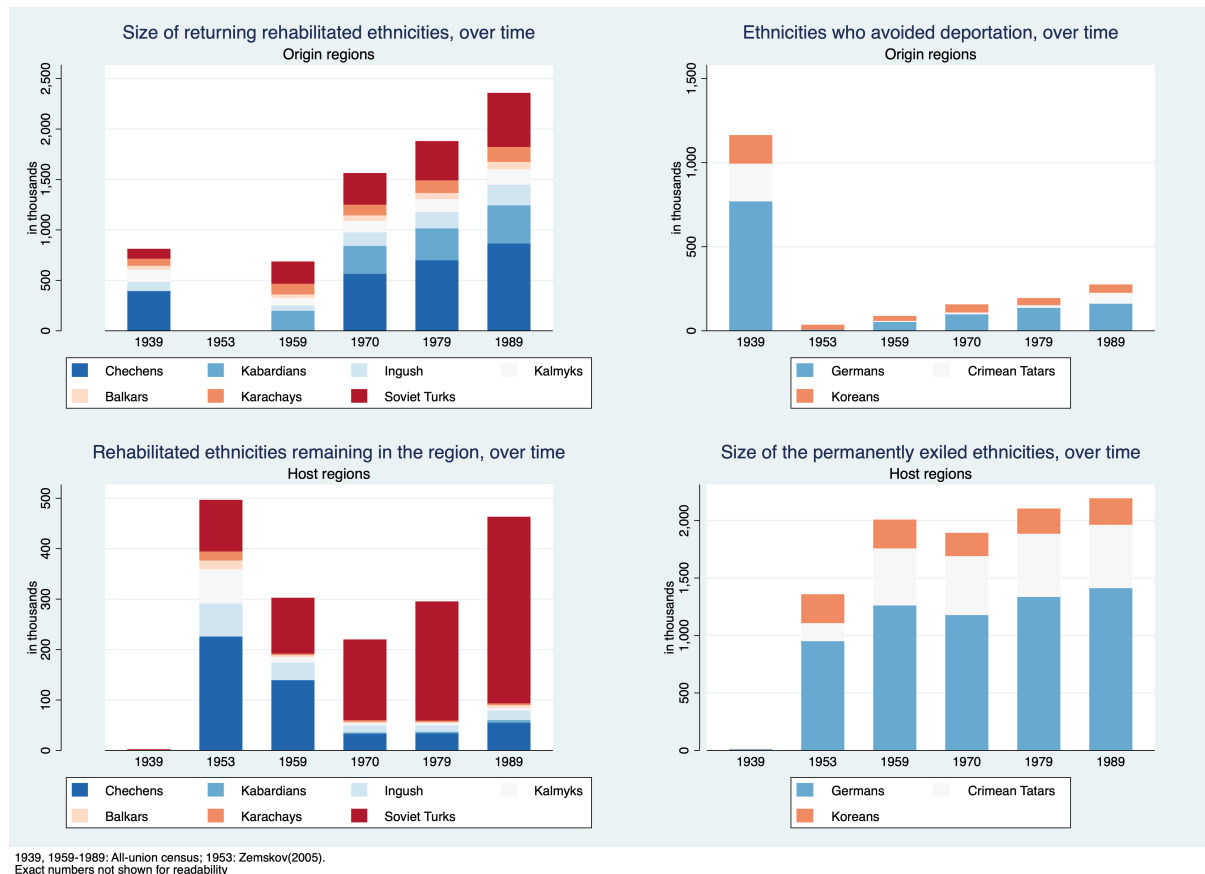
From 1972, the ban on the permanent residence of exiles was lifted, but they were still not allowed to return to their former homeland, and their administrative citizenship was still not recognized. They were faced with the choice of either submitting to the Soviet government's decision or seeking redress in associations, including the delegations and congresses of Soviet Germans, the congresses of Meskhetian Turks, and the "kurultays" of the Crimean Tatars. Despite their efforts, they were always denied the right to return. The Germans, in particular, were given various excuses, "under the pretexts of unsuitability, inappropriateness of timing, unavailability of necessary vast funds and impossibility for agriculture to be successful developed in the virgin lands without the German settlers' contribution" (Polian 2004, pp. 202).

Although the Soviet leadership acknowledged the criminal nature of the deportations in 1989, the now-Russian parliament did not fully restore the personal and administrative rights of these ethnic groups until 1991. Between 1991 and 2012, however, some 2.5 million ethnic Germans emigrated to Germany, underscoring the impracticality of this delayed decision, at least for this group. Figure A.2.2 in the Appendix shows the official 1996 rehabilitation

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[13] Compared to 2% of Chechens who spoke Russian as their native language (Polian 2004, p. 193).

decision of Olga Vasilevna Klauser. Mrs. Klauser was born in 1918, deported from the former Stalingrad oblast in 1941, and was 78 years old at the time of her rehabilitation.

1.3. Hypotheses

I exploit the quasi-natural experimental framework in which the deportations took place. In waves that followed one another closely, each ethnic group was almost completely removed from its origin regions and transplanted into the host regions with an unparalleled speed, professionalism, and technical sophistication. By using the exogenous allocation of "special settlers" to host regions and the 1956 rehabilitation decree as instrument for the randomness of the rehabilitation decision, I can rule out three general problems associated with the study of random violence: First, the violence may affect some ethnic groups more directly than others in the same place and time; second, the effect of deportation may not be proportional to the proportion of the population exposed to it; and finally, exposure to it may not be random (Zhukov, Davenport, et al. 2019). It also rules out the endogeneity problem that appears in many migration studies, according to which migrants tend to settle where they find the best employment opportunities or where other migrants from their group have previously settled, i.e., a process commonly referred to as chain migration.

1.3.1. Distributional Effects

Building on the findings of Steinhardt (2011), I examine the impact of the "special settler regime" in Soviet regions and use educational and occupational groups as classification criteria. I argue that the local employment situation in the host regions of Central Asia and Siberia was significantly affected by the severe downgrading of qualifications of both settlers and their descendants. Such downgrading occurs when migrants are worse off in the host country labor market, as measured by wages or employment, compared to locals with the same level of education and experience. This is generally most pronounced in the years following their arrival, as immigrants improve their skills and acquire complementary skills in the host country (Dustmann et al. 2016, p. 45). While earlier studies suggest that downgrading is less severe for earlier cohorts than for later arrivals (Dustmann et al. 2016, p. 57), the historical context suggests consistent downgrading of skills by "special settlers" and their descendants, which precludes endogenization of skills, i.e., acquisition of higher skills over time by themselves or their descendants.

As a result, permanently exiled "special settlers" and local or rehabilitated ethnic groups have very different employment and educational profiles that neither converge nor become more similar with increasing exile. The widely divergent skill distributions suggest substantial distributional effects in labor markets, making it appropriate to identify the effects of supply shocks on complementary local groups, i.e., locals and rehabilitated settlers. Given the positive demand shock from "special settlers," accounting for complementarities is of particular importance in assessing how migration shocks alter employment opportunities for local workers, especially because enterprising locals may have established different trading enterprises or realized economies of scale, which was likely for the latter in the Soviet context (Alix-Garcia and Saah 2010).

As the "special settlers" engaged in socially useful activities at low cost (Pohl 2000, p. 279), the non-settlers may have responded by specializing in communication-intensive occupations in which their language and cultural skills gave them a comparative advantage (Peri 2014, p. 8). The de facto low-skilled "special settlers" would thus have increased employment among the native non-settler population by causing occupational upgrading of low- and medium-skilled locals into high-skilled positions, which would require the acquisition of "culture-specific" knowledge and communication skills through higher education..

Hypothesis 1 *Upstream complementarities in the host region will lead to an increase in white-collar employment due an occupational upgrading of locals in response to their understratification by permanently exiled.*

Although labor and educational outcomes tend to behave synchronously, an individual approach allows me to assess whether and to what extent educational investments actually translate into specific labor market decisions. Indeed, if their evolution over time is anything but synchronous, i.e., a higher educational attainment is not accompanied by a corresponding evolution in white-collar employment, then motivations other than increasing material well-being would be behind the educational investment. The preceding considerations are to be reflected in the following hypothesis:

Hypothesis 2 *Upstream complementarities in the host region's local labor market will lead tertiary education to follow due to the acquisition of "culture-specific" skills necessary for the advancement.*

Experiences of violence can also have long-term effects on educational trajectories and affect the transmission of agricultural and nonagricultural human capital across generations. Studies of war-affected Tajik girls have confirmed the detrimental effects of violence on educational outcomes (Shemyakina 2011). On the other hand, some studies have linked episodes of mass violence and deportation to increased investment in higher education. It is assumed that families with forced migration histories can protect themselves from further negative shocks by reevaluating their educational preferences, being less myopic, and being more willing to invest in education or to value their offspring's education more highly than their own. The mechanism invoked is a shift in preferences toward higher education driven by the perceived higher probability of similar future shocks (Becker, Grosfeld, et al. 2020; Botticini and Eckstein 2005). Accordingly, I formulate this hypothesis for a shift toward more higher education for the rehabilitated ethnic groups who again enjoyed unrestricted access to higher education and freedom of movement beginning in 1956:

Hypothesis 3 *A capital flight into "portable" assets by rehabilitated settlers will increase tertiary and primary education in both regions after their rehabilitation.*

The significant concentration of "special settlers" in the low-skilled category suggests that the distributional effect of their inflow extended to the low-skilled locals and initially led to an oversupply of labor in the host labor market. Consequently, the influx of "special settlers" may have either made it more difficult for local low-skilled workers to find employment opportunities or displaced them altogether (not to mention their own unemployment) (Steinhardt 2011, p. 4). Accordingly, the influx of downgraded settlers may have negatively affected the underlying elasticity of substitution between special settlers and low-skilled locals, which would explain positive employment effects for low-skilled locals. Although these interactions are often not statistically significant, as highlighted in Peri (2014), the arrival of settlers may nevertheless have improved employment outcomes for locals at the next higher level of the skill distribution (Dustmann et al. 2016). Moreover, the disproportionate representation of the first "special settlers" with intermediate or higher skills, especially Crimean Tatars and ethnic Germans, may have increased the employment rate and skill profile of locals with at most primary education due to downstream complementarities. The following hypothesis summarizes the above:

Hypothesis 4 *Downstream complementarities in the host regions will lead to a gradual increase in collective farm employment, that is not associated with a corresponding increase in primary education.*

I examine the impact of a group-specific immigration shock on aggregate employment and education, using the share of permanent and rehabilitated ethnic groups as my primary explanatory variable. My meso-level approach estimates labor and education markets by dividing them into three distinct submarkets based on the gradient between occupation and skill (Steinhardt 2011, p. 6). To identify variations in the flow of specific settlers into (or out of) these submarkets, I assume that the allocation of specific settlers is (conditionally) independent of shocks to local employment and that only some submarkets are subject to an inflow of "special settlers." In this way, I avoid biases in the composition of employment and education categories due to trends in gender and ethnicity, and misclassification of ethnicities into education and wage groups due to "downgrading." My theoretical argument is based on heterogeneous treatment effects that are stronger in certain skill/occupation groups within the region that had to absorb a larger share of settlers. To obtain empirically credible estimates, I must assume strict exogeneity. That is, the decomposed categories do not change as a result of the shock and over time, nor do "special settlers" move up to the next higher category, which they de facto did not. Moreover, I need to take into account that the deported ethnic groups may have differed along other dimensions before their deportation, e.g., they were more (un)educated or politically (less) active than the non-deported (Borjas and Monras 2017, p. 409). Finally, I need to make sure that my estimates are not subject to post-treatment bias, making the effect a kind of mixture of the original exposure (the deportation) and the experience gained in the meantime (being a "special settler"), which may be a consequence of the exposure itself.

To do this, I use log changes in white-collar and collective farm employment respectively tertiary and primary education of the local non-settler population in the receiving and origin regions and relate them to the region-specific immigration shock. This defines the relationship between all rehabilitated or permanently displaced special settlers immigrating to the region and all locals in that region. Given the nature of the exercise (using publicly available

aggregate data over longer time periods), I control for pre-shock determinants (e.g., 1939 education and occupational levels) as the best fit for the pre-shock problem and apply my analysis to four different survey periods to capture unobserved liberalizations of special settlers' provisions over time (Borjas and Monras 2017, p. 409). This avoids any negative associations due to preexisting preferences and, moreover, uncovers unintended correlations between changes in the settler population and outcomes decades later (Walden and Zhukov 2020). From an identification perspective, I also rule out a problem related to upward mobility, since occupational and educational restrictions were not lifted for "special settlers" living permanently in exile including their descendants. Because potentially endogenous regressors are used as outcomes rather than controls, my derived estimates are informative and test whether they are affected by the "special settler" shock (Borjas and Monras 2017, p. 410). They are of immediate policy relevance and easy to interpret even if labor supply elasticities differ between low-skilled and high-skilled local workers, whose data I unfortunately do not observe.

Moreover, I can further rule out institutional inertia in the Soviet command economy that may have contributed to the observed results. That is because rigor and frequency of the five-year plans steadily declined from the mid-1960s onward, eventually reaching its low point in the last years of the Brezhnev leadership (Suesse 2018, citing Rutland (1993)). This is related to the fact that turnover in the Soviet elite, both at the upper and lower levels, virtually stopped from the early 1980s onward, leading to long tenures of officials and the emergence of informal networks often oriented along ethnic or clan lines (Hale 2015; Siegelbaum and Suny 1993). Especially in the Soviet periphery, they became powerful competitors of the central authorities in Moscow in the allocation and distribution of resources (Suesse 2018, p. 2938; Hale 2015, p. 54).[14] As a result, local discretion became a deeply rooted feature of the late Soviet economy, exacerbated by conflicts among the republics and the rapid retreat of central control under Gorbachev (Hanson 2014).

1.3.2. Social conflict

Because the deportations were primarily politically motivated, the effect of the rehabilitation decree on the political participation of the settlers' descendants is of great interest. Early studies of the civil wars in Sierra Leone (Bellows and Miguel 2009) and Uganda (Blattman 2009) show that experiences of violence can indeed increase voter registration and turnout. In this context, however, Zhukov and Talibova (2018) show that communities that were subjected to Stalinist repression have lower voter turnout in contemporary Putin Russia, which the authors attribute to the credibility of renewed retribution.[15] Similarly, Lupu and Peisakhin (2017) note that Crimean Tatars' family experiences with Soviet violence influenced their political attitudes three generations later. Similar to Nikolova et al. (2022), the following assumptions on the transmission and persistence mechanisms shall guide my analysis:

Assumption 1 *Transmission and persistence mechanisms.*

(i) *The impact of indiscriminate violence is not restricted to those who have directly experienced it, but also generates secondary effects that can manifest through changes in familial and communal interactions, institutionalization, and even epigenetic and evolutionary modifications among individuals.*

(ii) *Over time, individual experiences of violence can merge into shared collective narratives, especially in communities that have been exposed to it for prolonged periods. This persistent exposure can create a shared perception of a collective threat, which can influence the collective identity of all affected groups.[16]*

As for the possible political activism of the "special settlers" living permanently in exile, it can be assumed with a fair degree of certainty that for the first- and second-generation "special settlers," political activism was practically irrelevant for fear of future victimization, which would have suppressed any expression of political dissent. The case for their descendants, however, is not so clear-cut: on the one hand, they may have identified more strongly with their ethnic group, which could have led to their inherited ethnic identity being reflected in higher political participation, possibly as a defense mechanism to protect their ethnic group (Lupu and Peisakhin 2017, p. 83). On

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[14] Georgia was considered a hotspot for bureaucratic corruption and kinship networks, with first secretaries benefiting greatly from their titular group's identification with Christianity (Hale 2015, p. 54). In Uzbekistan, a cartel of republican leaders successfully manipulated the cotton trade for decades (Suesse 2018, p. 2938). Leningrad, Riga, and Odessa were important gateways for the shadow economy (Suesse 2018, cited in Grossmann (1997), p. 34).

[15] See also Balcells (2011) and Rozenas et al. (2017).

[16] See Boyd and Richerson (1985) and Lupu and Peisakhin (2017). Where family socialization competes with other sources, i.e. formal education, an increasing effect would emanate from an excessive exposure to violence (Bisin and Verdier 2001).

the other hand, the local population in general, and this population group in particular, may have lost confidence in politics as a whole, regardless of ideology and family experiences of violence.

The fact that the 1991 referendum allowed for a vote on a secessionist alternative makes this analysis highly interesting, as both the strength and the ability of a central government to act collectively have proven crucial to the stability of a political system in the face of strong distributive pressures (Keefer 2009; Castañeda Dower, Markevich, et al. 2021). Given the historical link between repression and unrest and the likelihood that both grievances (and repertoires of struggle) survived the deportation experience, the differences in living standards between the permanently exiled and the local may have necessitated more revolutionary measures provided by secessionist movements. A general turn toward nationalist and thus secessionist political preferences or a radicalization of the electorate in the late Soviet Union would therefore explain a rejection of Soviet domination (positive effect). Analogously, an affirmation of the status quo (negative effect) would correspond to an inclination of the electorate toward communism, possibly to avoid economic losses (Castañeda Dower, Markevich, et al. 2021). This can be summarized as follows:

Hypothesis 5 *Host regions with a larger share of permanently exiled settler ethnicities in 1989, tend to vote against the Soviet supremacy and protest more.*

In Russian and Soviet history, however, the series of violent political upheavals, such as uprisings, assassinations, invasions, general strikes, and revolutions, were characterized not only by domestic caesuras, but were often associated with a change in political leadership. Unrest and instability in general, however, contributed to increased uncertainty about the future (Grosfeld, Sakalli, et al. 2020). And while the Great Terror left ethnic networks vulnerable and highly dependent on Stalin himself, and Khrushchev's institutional restructuring made them difficult to function, they flourished under Brezhnev's policy of "stability of cadres" (Hale 2015, p. 53). Most notably, under Gorbachev, a series of reforms he pushed through unhinged the Moscow system of self-fulfilling expectations that underpinned Soviet rule (Suesse 2018, p. 2938).[17] The political space in the Soviet Union gave new autonomy and authority to the leaders of the Union republics, who formally and informally held most of the power but had previously been subordinate to the central leadership (Hale 2015, p. 54 & 55). The return migration of rehabilitated ethnic groups, their higher birth rates compared to ethnic Russians, and the accelerated emigration of Russians in the late 1970s produced a substantial layer of intelligentsia who integrated into or belonged to Russian society to varying degrees. Therefore, any change in the status quo could reverse the trend of increasing ethnic self-assertion and lead to a series of economic dislocations, which in turn would explain higher approval of Soviet rule in the origin regions, as the following hypothesis shows:

Hypothesis 6 *Origin regions with a larger share of returning settlers tend to vote in favor of the Soviet supremacy and protest less.*

To measure the overall extent of the deportation experience, I use two variables: the log proportion of votes against preserving the Soviet Union in the 1991 referendum and the log number of protests and riots during the late Soviet Union. As outlined earlier, I include the proportion of permanent and rehabilitated ethnic groups in 1989 as the primary explanatory variable. Theoretically, as mentioned above, my argument is based on the idea of heterogeneous treatment effects along two social conflict dimensions, and I expect to observe stronger effects in host regions with a larger share of permanent displaced persons in 1989 and in origin regions with a larger share of rehabilitated "special settlers" who returned. My primary channel of identification is based on the assumption that the "special settler regime" influenced turnout and protests only through the actual rehabilitation decision and not through other channels, after controlling for various factors such as the educational and occupational levels of the 1989 non-settler population, the extent of intergroup interactions, and the known historical dimensions of violence. In this way, I avoid unintended correlations between the size of the respective settler ethnic groups in 1989 and the occupational and skill gap of the locals, which could be due to unobserved patronage networks.

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[17] The parliamentary elections he announced in the republics and the abolition of the Communist Party's compulsion to dominate shattered previously stable political expectations in society.

1.4. Data

1.4.1. Historical censuses

The bulk of my data comes from aggregated regional-level information from six historical censuses conducted by the Soviet Union in 1926, 1939, 1959, 1970, 1979, and 1989 (Gosstatizdat 1962a; Gosstatizdat 1963c; Gosstatizdat 1962b; Gosstatizdat 1963a; Gosstatizdat 1963b; Statistika 1972b; Statistika 1973; Statistika 1972a; Isupov 1989b; Isupov 1989a; Publications 2011).[18] These census data were physically obtained from the Staatsbibliothek zu Berlin, with the exception of the 1989 census data, which I obtained digitally from the GESIS archives. My sample consists of 134 administrative units in six autonomous republics that existed between 1922 and 1989 and received or sent "special settlers." These administrative units consist of oblasts (regions), okrugs (regions with special status that may be autonomous), and larger krajs (territories). To avoid double counting, I exclude smaller regions that are included in larger regions. In addition, inconsistencies in reporting regions that are part of larger metropolitan areas or city-states such as Tashkent or Tbilisi made it challenging to distinguish between a city and an oblast, so I use oblast-level data. To maintain consistency, I limit my sample to Soviet territory within its prewar borders and exclude Finnish territories annexed after the "Winter War." In this way, I incorporate all administrative units established before December 31, 1939, and which are covered by most censuses. This cutoff date is chosen arbitrarily and reflects the period between the beginning of World War II, which was marked by the German attack on Poland, and the time when these developments reached the higher levels of Soviet government. After applying this restriction, my sample consists of 98 administrative units.

Ethnic composition

I obtain data on the ethnic composition of the territorial units from `www.demoscope.ru`, a research project at the Higher School of Economics in Moscow designed to provide economically relevant information on the Soviet Union and its successor states. Their data allow me to track changes in ethnic composition in the regions over different time periods. Two pieces of information are recorded in the census data to determine a person's ethnic identity: his or her nationality and native language affiliation. Although these categories largely overlap, differences may occur due to the wording of the questions, the meaning of the answers, and other sources on ethnic composition (Silver 1986).[19] To avoid misclassifying deported ethnic groups as ethnic Russians who have undergone forced or voluntary cultural and linguistic assimilation, I use ethnic designation (rather than citizenship) based on self-reported citizenship by Soviet citizens between 1926 and 1989, as well as mother's citizenship for bi-ethnic children. In cases where ethnicity is difficult to determine, such as in Central Asia, census data are preferred over vital statistics because of insufficient birth registration in the region.

Since no questions were asked about whether individuals or their parents had previously identified with another nationality, nationality could obviously serve as a source of potential self-selection arising from the relative attractiveness of "ethnic reidentification," which would be more pronounced for small and medium-sized non-Russian countries (Anderson and Silver 1989, p. 611).[20] It is important to note that nationality is not always an accurate indicator of membership in an ethnic group, but it has generated little controversy (or even debate) among scholars. It can be assumed, however, that claims of Russian cultural affiliation were not common in the last census, as a more favorable climate for claims of such affiliation prevailed during the Gorbachev era, as evidenced by the substantial increase in the Crimean Tatar population (doubling) and Turks (more than doubling) between 1979 and 1989, which was not due to natural population growth (Anderson and Silver 1989, p. 652). To address potential problems with Soviet data (see Section 1.4.1), I log-transform the numbers of deported ethnic groups, ethnic Russians, Ukrainians, and Belarusians.[21]

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[18] The 1989 census data are additionally available as digital files in the GESIS archives.

[19] The "set of nationalities" is restricted by the number of ethnonyms provided to respondents (1939: 97 vs. 1959: 109). In other cases, the native language is used to determine nationality, accelerating the linguistic Russification and administrative decline of certain ethnic groups between 1926 and later censuses (Silver 1986, pp. 71 & 85).

[20] This is different for internal passports, which for most Soviet citizens aged 16 and older list their self-reported nationality, which could not be changed. I am not aware of any studies that examine the empirical relationship between subjective nationality, as asked in census questions, and official nationality, as recorded in passports.

[21] In the subsequent analyses, I further eliminate illogical outliers by using Winsorization. The goal of Winsorization is to increase the robustness of statistics by minimizing the impact of extreme observations, which is especially effective after a

Special Settlers

The data on the deportees and their demographics used in this study come from Zemskov (2005), a historian who has written several articles on the "special settlers" at the Institute of Russian History of the Russian Academy of Sciences. His 2005 book "Spetsposelentsy" ["Special Settlers"] provides the scientific basis for the deportation data and is based on reports of the NKVD in the State Archives of the Russian Federation and other Soviet archives. These reports contain annual data on the number of different ethnic groups deported, their locations, work assignments, and demographic changes in the target regions in Russia, Kazakhstan, Kyrgyzstan, and Uzbekistan. The data employed in this study are from January 1, 1953, the year in which the "special settler" regime reached its zenith with 2,753,356 persons registered as such. Note that the Baltic peoples and the Belarusians, who were deported in the early and mid-1930s, are excluded because they were deported because of their social status as kulaks. To obtain data on the ethnic composition of the deportees' regions of origin, I rely on the supplement Polian (2004), which contains information on the timing of the actions, the number of deportees from each ethnic group, and their origin regions. Since deported ethnicities are grouped together, I calculated the breakdown of ethnic groups by administrative region by comparing their distribution with the 1939 census and data from Lorimer (1946, Tables 23 and 55) on their regional concentrations.[22]

Koreans, defined in the present context as Soviet citizens and Japanese subjects, are missing from the 1939 census data because they had already been deported in 1937. To reconstruct their regional concentration in 1939 as if they had only been deported in 1939, I use their 1926 concentration in the districts that later became the 1939 regions. In doing so, I assume that their spatial concentration was constant between 1926 and 1939. I multiplied their share of the geographic distribution by the total number of Koreans in 1937 (172 thousand) and adjusted for their population increase between 1937 and 1939 (already in the host areas). Since Zemskov (2005) does not give the number of Koreans as "special settlers" in the host areas, I approximated the total number of Koreans in 1953 using their 1959 census values. In addition, the Soviet statistical office changed its approach to the designation of certain ethnic groups, such as the Crimean Tatars and Meskhetian Turks. The 1959, 1970, and 1979 census reports did not list a separate number of Crimean Tatars, and this group appears to have been grouped together with the Volga Tatars under "Tatars" (*tatary*), especially for the Central Asian and Caucasian republics (Anderson and Silver 1989). However, the historical context suggests that the (Volga) Tatars listed in the census publications for Central Asia and the Caucasus are Crimean Tatars, since the former were not deported from the Tatar ASSR. Therefore, I code the number of Tatars recorded for Uzbekistan, Georgia, Kazakhstan, and Kyrgyzstan as Crimean Tatars. Similarly, "Turks" living in Uzbekistan and Kazakhstan are coded as Meskhetian Turks (Anderson and Silver 1989, p. 652).

Overall settler shock   From this data, I construct three variables designed to capture the effects of a change in the proportion of "special settlers". The overall migration shock shall be captured by the following variable:

$$\Delta \mathrm{Set}_{i,39 \to 59} = \left(\frac{\mathrm{Set}_{i,39}}{\mathrm{Pop}_{i,39}} - \frac{\mathrm{Set}_{i,53}}{\mathrm{Pop}_{i,59}} \right) * 100\% \tag{1}$$

where $\Delta \mathrm{Set}_{i,39 \to 53}$ is the total change in the percentage of all ethnic minorities resettled and $\frac{\mathrm{Set}_{i,39}}{\mathrm{Pop}_{i,39}}$ is the percentage of settlers in the origin regions on the eve of their deportation. It is calculated from the total number of ethnic groups to be deported in 1939 ($\mathrm{Set}_{i,39}$) in relation to the total population in 1939 ($\mathrm{Pop}_{i,39}$) according to the 1939 census. Conversely, $\frac{\mathrm{Set}_{i,53}}{\mathrm{Pop}_{i,59}}$ is the percentage of deported ethnic groups now categorized as "special settlers" ($\mathrm{Set}_{i,53}$) in the host region, calculated from the total number of deported ethnic groups as of January 1953, as reported in Zemskov (2005). Thus, it is the change of ethnic Germans from European Russia and Central Asia, Kalmyks, Chechens, Ingush, Balkars, Karachays and Meskhetian Turks from Transcaucasia, and finally Crimean Tatars from Crimean peninsula in Ukraine in their respective population figures.

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log transformation. This involves replacing all log-transformed values that fall below or above the mean plus three standard deviations with the closest valid value.

[22] Similar studies include the proportion of enslaved district population in the United States (Acharya et al. 2016), the proportion of serfs in the Russian district population (Castañeda Dower, Finkel, et al. 2018), shipping statistics on the transatlantic slave trade (Nunn and Puga 2012; Nunn and Wantchekon 2011), and the proportion of Jews murdered during the Shoah (Acemoglu, Hassan, et al. 2011).

Host and origin regions. To classify regions based on their settler status, I use the change in deported ethnicities between 1939 and 1959 as formulated in Equation 1 and categorize regions that experienced a collapse in the total number of settlers as origin regions, while those that experienced an influx of settlers as host regions. This approach yields a final sample of 98 spatial units, with 49 origin regions and 49 host regions. My overall sample size is therefore consistent with Stock and Watson (2019)'s rule of thumb of 100 and exceeds the number of oblasts in Acemoglu, Hassan, et al. (2011) after sub-sampling. My cross-sectional sample consists of nearly 98 oblasts, evenly divided between the admission and deportation of "special settlers". Table A.3.6 and Table A.3.7 in the Appendix provide the regional split into origin and host regions.

Rehabilitation status   Moreover, the rehabilitation decree divided the deportees in two groups. Equation 2 shall capture the share of ethnicities, who were restored respectively not restored in their political, administrative and civil rights.

$$\Delta E_{i,39 \to 53} = \left(\frac{E_{i,39}}{\text{Pop}_{i,39}} - \frac{E_{i,53}}{\text{Pop}_{i,59}} \right) * 100\% \quad \text{and} \quad \Delta R_{i,39 \to 53} = \left(\frac{R_{i,39}}{\text{Pop}_{i,39}} - \frac{R_{i,53}}{\text{Pop}_{i,59}} \right) * 100\% \tag{2}$$

where $\Delta E_{i,39 \to 53}$ is the change in the share of ethnic minorities in the permanently displaced population and $\Delta R_{i,39 \to 53}$ is the share of ethnic minorities that were returned to political, administrative, and territorial sovereignty. They are calculated, first, from their respective ethnicity-based share on the eve of their deportation in the total population of the region according to the 1939 census; $\frac{E_{i,39}}{\text{Pop}_{i,39}}$ and $\frac{R_{i,39}}{\text{Pop}_{i,39}}$. Second, their respective ethnicity-based shares in region i after deportation on Zemskov (2005); i.e., $\frac{R_{i,53}}{\text{Pop}_{i,59}}$ and $\frac{E_{i,53}}{\text{Pop}_{i,59}}$. Thus, my indicators represent the share of Germans, Meskhetian Turks, Koreans, and Crimean Tatars or Kalmyks, Kabardians and Balkars, Chechens, and Ingush deported to Central Asia and Siberia in the total population in 1959. Each indicator is only positive for regions that hosted either permanently displaced or rehabilitated ethnic groups.

Minority status   Finally, to capture the overall ethnic fabric and minority status of permanently exiled and rehabilitated ethnic groups in the Soviet regions, I follow Hipp and Wickes (2016) and calculate the proportion of expected intergroup linkages (neighbor_i) of permanently exiled individuals based on their likelihood of interacting with other ethnic groups in region j:

$$\text{neighbor}_{i-i,j} = \frac{2[n_i * (n_{-i})]}{\text{totint}_j} \quad \text{where} \quad \text{totint}_j = \frac{N_j}{(N_j - 1)} \tag{3}$$

where n_i is the number of people in permanent exile, that is the number of Meskhetian Turks, Crimean Tatars, ethnic Germans and Koreans. Consequently, n_{-i} is the number of all other people residing in the respective region, not deported at all or rehabilitated. The between-group interaction is calculated based on the total number of interactions (totint_j) in a region j, that is calculated from N_j as the total population in the region j.

Labor and education outcomes

To approximate employment levels in the Soviet Union, I use the main occupational data from the censuses, which classify citizens into three categories: Blue-collar workers (*rabochie*), white-collar workers (*sluzhashie*), and collective farmers (*kolkhozniki*). The categories used to track social classes were consistently recorded from 1939 to 1989, with the exception of individuals who were unclassified or unclassifiable in the 1959 and 1989 censuses. In order to maintain consistency, unclassified or unclassifiable persons listed in the 1959 and 1989 censuses are omitted. Furthermore, the publication of the 1939 occupational data was limited to a separate edition for Soviet Russia in 1992, leaving other Soviet republics without comparable data and requiring their reconstruction. To address this issue, the 1959 tables for all Union republics are utilized to reconstruct the 1939 social classes. To reconstruct the 1939 social classes, the reported number of workers in urban and rural regions with completed tertiary or secondary education, as well as those with incomplete secondary education and the reported nationwide labor force is used, i.e., persons with occupations or employed in part-time agriculture.[23]

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[23] It is important to consider the potential for overestimating employment in agriculture and underestimating employment in blue-collar occupations for agricultural workers who engaged in non-agricultural work as self-employed individuals or in seasonal production jobs, as primary occupation in the censuses was self-reported (Cheremukhin et al. 2013, p. 16).

In addition, I collect data on educational attainment in six categories consistently reported in the censuses from 1959 to 1989: Completed higher education (*vysshim*), incomplete higher education (*nezakonchennym vysshim*), special secondary education (*srednim spetsial'nym*), general secondary education (*srednim obshchim*), incomplete secondary education (*nepolnym srednim*), and primary education (*nachal'nym*). To simplify the analysis, I combine them into a three-tier educational structure: higher education, secondary education, and primary education. As above, the number of persons with primary education in 1939 requires reconstruction, and so I use the proportion of persons in each region with primary education in 1959 and multiply it by the total number of persons living in rural areas in 1939. This approximation assumes that persons with elementary education lived predominantly in rural areas and that their proportion did not change over twenty years.

To make use of a more accurate ethnic self-identification in the late Soviet Union, I reconstruct the proportion of the local non-settler population using the 1989 digital census from the GESIS research archive. The 1989 data contain totals and ethnically based shares by education and labor force participation, with the latter disaggregated for the largest minorities by their respective education levels. Their presentation also allows condensation into a three-tiered structure, i.e., higher education, secondary education, and primary education, where I assume that a certain level of education is required to pursue a particular occupation, i.e., employed ethnic groups with completed and incomplete higher education are found in white-collar positions, etc. While this information is recorded for all rehabilitated ethnic groups, Russians, Ukrainians, as well as Belarusians in the RSFSR, it is inconsistent in the other Soviet republics.[24] For consistency, missing numbers in the respective Union Republics are filled in first with RSFSR numbers, then with Kazakh SSR numbers, and finally with Georgian SSR numbers.[25]

These data can be used to determine the proportion of local non-settlers, rehabilitated and permanently displaced persons in the total three-tier labor force. Further, I form two categories for the local non-settler population, one that includes ethnic Russians, Ukrainians, and Belarusians, and one that excludes them.[26] It should be noted that under the 1956 Rehabilitation Decree, Karachays, Balkars, Chechens, Ingush and Kabardians are automatically included in any definition of "local".[27] Finally, I approximate local employment and education structures by multiplying the total employment and education categories by the share of non-Slavic locals.[28]

A note on the accuracy of Soviet data

While carrying out such complex data collection, it is necessary to comment on the accuracy of the Soviet data. Indeed, the Soviet data are usually given to the last digit, indicating that the data collectors must have worked very carefully. However, there are regular conflicts for the same categories in different census volumes due to counting, omission, or copying errors (Pohl 2016, p. 287; Getty et al. 1993; Naimark 2010). The most pressing problems are probably the temporal, definitional, and geographic comparability, which complicate cohort analysis. Nevertheless, the accuracy of the Soviet data appears to be valid when reported with few inconsistencies, and it even improves over time (Clem 1986, p. 18). Another problem is the tendency of statisticians and survey officers to a certain "plan constructivism." This can take the form of censorship, such as withholding entire categories of information or using confusing formats (Clem 1986, p. 24). The latter is very much in evidence for ethnically based employment and education categories. In the 1959 and 1970 census publications, their proportions are tabulated without base levels, which prevents a more accurate calculation of ethnically based employment and education levels.

This "plan constructivism" may exaggerate Soviet achievements or hide socioeconomic or demographic trends that are inconsistent with the official account of Soviet life. This may not have been intentional; the terrible fate of the 1937 census takers after writing down the "wrong numbers" certainly may have played a role (Wheatcroft 2019). The most prominent example is the controversial 1939 census, as the previous one had been conducted only

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[24] Data on Meskhetian Turks are available only for the Georgian SSR, but data on Germans are only available for the Kazakh SSR.

[25] This is consistent with Acemoglu, Hassan, et al. (2011), who use republic-level Jewish middle class numbers in 1926 to estimate the impact of population collapse due to the Shoah.

[26] Cases where the share of locals (with or without Slavs) is less than 0.25 or greater than 1 are considered erroneous and replaced with the mean values.

[27] I avoid distinguishing between allochthonous and autochthonous ethnic groups because this would give the false impression that a culturally diverse settler population was absorbed by an otherwise ethnically homogeneous population. Since the Great Reforms of 1861, however, Central Asia in particular experienced massive waves of internal migration of Slavic peoples, transforming a region populated predominantly by Muslim Turkic peoples since the 15th century into a multiethnic and multiconfessional society between 1896 and 1916 (Cameron 2018, ch. 1).

[28] The following tables and estimates use the narrow definition that excludes the Slavic population. Results for the latter are available upon request.

two years earlier and subsequently invalidated after revealing a population loss in the millions due to Stalin's forced collectivization policies in Ukraine and Kazakhstan (Naumenko 2021; Kindler 2018). The first peacetime census was conducted fifteen years after the war in 1959, again to hide the enormous loss of life due to the war. However, the time lag of the first peacetime census, however, accounts for several developments relevant to this project. These include the gradual release of soldiers from the Red Army between 1945 and 1948 and their reintegration into civilian life, the mass amnesties and releases from the Gulag after the Red Army's victory over Hitler's Germany, and the return of rehabilitated "special settlers" beginning in the mid-1950s (Clem 1986). Overall, the Soviet censuses conformed to most international recommendations for preparing and conducting censuses. However, they fail to provide comprehensive census results and tables (Schwartz 1986, p. 65).

1.4.2. World War II-related violence

While conflict is associated with a temporary decline in economic growth (Davis and Weinstein 2002; Miguel and Roland 2011), there is disagreement on its long-term effects (Besley and Reynal-Querol 2014). To capture these narratives, I control for several dimensions of violence that afflicted the Soviet population.

The Shoah

There may be adverse economic effects for the highest skill and education levels in response to the Shoah, especially if oblasts with a large Jewish community are systematically different from others. If these communities were on average more open-minded, entrepreneurial, or better educated due to a longer history of persecution, as scholars such as Botticini and Eckstein (2005), Shtakser (2014), and Akhiezer (2013) point out, then this would translate into different economic and political development paths, as documented by Grosfeld, Rodnyansky, et al. (2013) and Acemoglu, Hassan, et al. (2011). To assess this, I examine the proportion of missing Jews between 1939 and 1959 in each oblast using census data supplemented with information from Altshuler (1993).

Post-1959 censuses separately record several Jewish subgroups, such as Mountain Jews (*yevrey gorskiye*), Georgian Jews (*yevrey gruzinskiye*), Asian Jews (*yevrey sredneaziatskiye*), and Krymchaks (*krymchaki*). The Mountain Jews refer to the Jewish population of Dagestan and northern Azerbaijan, Kabardino-Balkaria, Chechnya, the Stavropol region, Karachay-Cherkessia, and the Krasnodar region. The Krymchaks are a Jewish ethno-religious community in Crimea descended from Turkic-speaking adherents of Rabbinic Judaism. The Asian and Georgian Jews refer to Jews who were native to either Central Asia or Georgia.[29] I count all Jewish subgroups listed in the censuses as part of the total number of Jews. To account for the proportion of missing Jews, I construct a variable that includes any Jewish subgroup not listed in the census between 1939 and 1959:

$$\Delta \text{Jews}_{i,39\to59} = \left(\frac{\text{Jews}_{i,39}}{\text{Pop}_{i,39}} - \frac{\text{Jews}_{i,59}}{\text{Pop}_{i,59}} \right) * 100\% \tag{4}$$

where $\Delta\text{Jews}_{i,39\to59}$ is the change in the percentage of Soviet Jews in region i from 1939 to 1959, that is calculated from $\frac{\text{Jews}_{i,39}}{\text{Pop}_{i,39}}$, which indicates their share of the total regional population in 1939, and $\frac{\text{Jews}_{i,59}}{\text{Pop}_{i,59}}$, which indicates their share of the regional population in 1959. Figure 1.4 compares the size of Soviet Jewry on the eve of the Shoah with its size in 1959. While Jews on the western borders of Soviet Russia were virtually non-existent after mass murder and oppression, non-European Jewish subgroups appear to have been deported to Central Asia along with the other peoples of the Caucasus and the Crimean Tatars.

Nazi Occupation

Between June 1941 and November 1942, the German Wehrmacht advanced far into Ukraine, the Caucasus, and most of European Russia. This included major population centers such as Belgorod, Stalingrad, Tula, Kalinin, and Leningrad, all of which were on the German-Soviet front.[30] The war resulted in significant human casualties and the destruction of infrastructure and capital. However, to my knowledge, there is no data on the war-related destruction by city or region, nor is there (and probably never will be) any information on any reconstruction efforts.

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[29] A non-natural population increase from 1979 to 1989 is also evident in the number of Mountain Jews (more than doubled) and the number of Georgian Jews (91% increase) (Anderson and Silver 1989, p. 652).

[30] See Figure A.2.3 in the Appendix for a map of the World War II front line.

Figure 1.4.: Spatial distribution of Soviet Jews (in thousands)

(a) On the the eve of deportation 1939

(b) In the host regions 1959
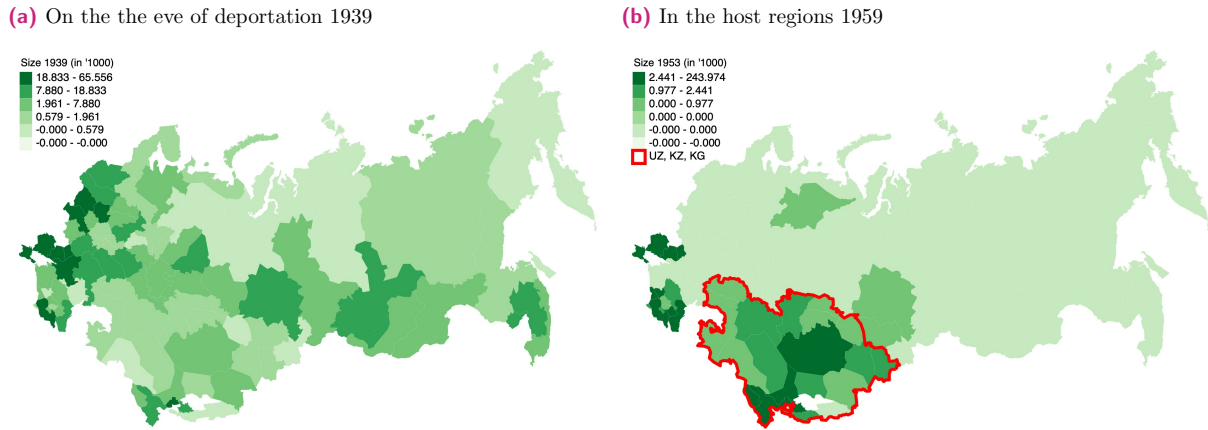
To determine the extent of war-related violence during World War II, I use city-level data from Dudarenko et al. (1985) on the German occupation of Soviet cities. This data is widely considered the most comprehensive collection of information on occupation and counter-occupation during and after World War II.[31] The collection covers 670 towns, including 198 towns in present-day Russia, and includes details about the beginning and end of the German occupation, as well as the events that led to the liberation of a town. To convert the data from the Cyrillic to the Latin alphabet for geocoding, I used the standard GOST 7.79 System B transliteration. I identify occupied regions with a dummy variable that identifies regions where at least one town was occupied by the German Wehrmacht for at least six months.

Military preparedness

To capture the impact of the German advance on economic geography in occupied regions, I rely on data from Dexter and Rodionov (2020) concerning the number of Soviet and Russian defense and research facilities from 1922 to 2018. Specifically, I use version 21 of the data, which contains 32,995 records of factories involved in military production during and after World War II, including information on the ID, name, address, country, subordinate, superior, and specific enterprise, such as construction or branch (*otdelenie*). To avoid double counting, I exclude facilities that were evacuated between 1941 and 1942 and then redeployed after the war, based on matching descriptions, administrative personnel, and locations. Using this data, I calculate the variable $\mathrm{gDef}_{i,39\to59}$ to capture the degree of military preparedness of the pre- and post-war Soviet Union.

$$\mathrm{gDef}_{i,39\to59} = \frac{\mathrm{Def}_{i,59} - \mathrm{Def}_{i,39}}{\mathrm{Def}_{i,39}} \tag{5}$$

where $\mathrm{gDef}_{i,39\to59}$ is the growth of the defense industry in region i that is calculated from the difference of total number of defense facilities in 1959 less its 1939 numbers over its 1939 values. I further set $\mathrm{gDef}_{i,39\to59} = 0$ if $\mathrm{Def}_{i,59}$ or $\mathrm{Def}_{i,39} = 0$.

USSR penal system

Likewise, the Gulag may have contributed to altered political preferences, as it directly and indirectly affected millions of people, i.e. through the disappearance of friends and neighbors.[32] Evidence supporting this claim is provided by Zhukov and Talibova (2018), who used detention records and contemporary survey data to show that communities that experienced more repression are less likely to vote today. Similarly, Nikolova et al. (2022) demonstrate that differences in social capital among present-day descendants of former Gulag inmates can be traced back to the forced labor camps. Furthermore, Alexopoulos (2005) highlights the close link between the Gulag and the non-Gulag world through the "revolving door" effect.

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[31] The data from Dudarenko et al. (1985) is available online at `www.soldat.ru` and was last accessed in 2020.

[32] The Gulag is an acronym for the "Main Directorate of Punitive Labor Camps and Settlements." It consisted of regular and special prisons, filtration camps, penal labor colonies and special settlements, and scientific prisons.

To construct a Gulag growth variable reflecting the increase in the number of labor camps in a region i between 1939 and 1959, I use data from the now-dissolved human rights organization Memorial, made publicly available via www.memo.ru. Since 1988, this organization has been dedicated to preserving the historical memory of the USSR penal system and cataloging the victims of Stalinist terror. I extracted detailed information from their database "Sistema Ispravitel'no-Trudovykh Lagerey v SSSR" [System of Penal Labor Camps in the USSR][33], which provided information on the production, number of inmates over time, establishment date, and dissolution date. The replication data on Gulags located Soviet Russia provided by Zhukov and Talibova (2018) served as a starting point for a comprehensive extension to the Central Asian and Caucasian vector, and all facilities were geocoded by location to match the administrative units in each Soviet region. Facilities with missing location or existence information were intentionally excluded, resulting in a dataset of 400 camps, mostly located in Russia and Kazakhstan.

$$\text{gGulag}_{i,39 \to 59} = \frac{\text{Gulag}_{i,59} - \text{Gulag}_{i,39}}{\text{Gulag}_{i,39}} \tag{6}$$

where $\text{gGulag}_{i,39 \to 59}$ is the growth of the Soviet penal camp system in region i, which is the difference between the total number of Gulag camps active in 1959 minus those active in 1939 versus 1939 values. I set $\text{gGulag}_{i,39 \to 59}$ if $\text{Gulag}_{i,59}$ or $\text{Gulag}_{i,39} = 0$. As a result, $\text{gGulag}_{i,39 \to 59}$ captures the everyday experiences of common citizens due to the intertwining of the Gulag and non-Gulag worlds.

1.4.3. Social conflict

To measure differences in political behavior, I used the results of the March 1991 referendum on the preservation of the Soviet Union, which captured dissent with the incumbent government. The referendum, which took place on March 17, 1991, was the first direct measure of political behavior throughout the Soviet Union (Austin 1996, p. 3). The main question asked was:

> *Do you consider it necessary to preserve the USSR as a renewed federation of equal sovereign republics, in which human rights and the freedom of all nationalities will be fully guaranteed?*

Of the regions studied, only the Georgian SSR refused to set up its own polling station, and the Soviet central government did so for Georgia, resulting in a lower turnout in that republic. However, independent international observers considered the election itself to be fair and not rigged (Commission 1991, p. 15). 76% of the votes were cast in the affirmative, representing 58% of eligible voters. I obtained the regional results for the Central Asian republics from Kireev and Sidorenko (2007) and www.gorby.ru. Since the data for the Central Asian republics are only available at the republic level, I calculated the regional data using their predictive mean, a simple and versatile method based on observed and realistic values. Votes cast against the preservation of Soviet supranational dominance were inverted and logarithmized. The terms "anti-government," "anti-communist," and "secessionist" are used interchangeably in the discussion, as they are frequently used.

To capture how distrustful the public was of the electoral system in general and whether citizens may have been discouraged from voting in particular, I use Mark Beissinger's data collection on mobilization episodes, such as riots and protests, in the Soviet Union between the late 1980s and early 1990s. His data include marches, demonstrations, protests, strikes, riots, pogroms, and civil wars based on events reported in more than 150 Western and local newspapers and other periodicals. From January 1987 to December 1992, he identified 6,663 demonstrations and 2,177 incidents of mass violence (King 2004, p. 441). To approximate active political dissent between 1987 and 1992, I use the number of recorded demonstrations and riots.

Table A.3.4 in the Appendix provides descriptive statistics and correlates for the dependent variables of interest, sorted by employment, education, and local political behavior. From 1939 to 1959, the strength of the correlation decreases and is accompanied by a loss of statistical significance, suggesting that deportation and rehabilitation decrees may have played a significant role in the socioeconomic variables decades later.

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[33] See http://old.memo.ru/history/nkvd/gulag/index.htm, last accessed on July 25, 2020.

1.5. Empirical Strategy

1.5.1. Spatial relationship

When analyzing voting patterns in the Soviet Union, it is crucial to account for the country's vast geographical expanse and the intricate relationships between its republics through plans and subsidies. This is because financial support from the center to the periphery may have impacted pro-Soviet voting behavior in the 1991 referendum. Specifically, regions located farther away from Moscow may have been more alluring to receive government aid and, consequently, more inclined to vote in favor of maintaining the Soviet Union. However, research by Kelly (2019) has highlighted the prevalence of inflated significance levels and Gauss-Markov assumption violations in many economic history studies, often caused by spatial autocorrelation. Ignoring spatial dependence may therefore lead to biased and inconsistent estimates if present in the dependent variable, or unbiased but inefficient estimates if present in the error term. To address this issue, it's essential to identify which regions influence other regions and how they do so, considering geographic, economic, and political distances between different areas.

To establish the spatial relationship between my sample units, I utilized the Soviet administrative units from the first comprehensive Soviet World Atlases of 1937 and transformed them into polygons using QGIS 3.16. These maps were obtained from David Rumsey's historical map collection and account for boundary changes between 1937 and December 31, 1939, using a similar map from the 1967 Second Soviet World Atlas. From there, I created two symmetric weighting matrices based on contiguity, denoted as $W^s = S, R$, where s represents the origin, sending, or receiving regions. To improve the model's estimability, the matrices were spectrally standardized to ensure non-singularity. Additionally, I ensured that each region was adjacent to at least one neighboring region, in line with contiguity patterns and technical requirements. Furthermore, I assume that the underlying spatial variability was characterized by $|\rho| < 1$ and $|\lambda| < 1$, similar to the stationarity constraints for autoregressive-moving-average ($ARMA$) type models. Visual inspection of the dependent variable semivariograms (Cox 2005), as illustrated in Figure 1.5, confirm the presence of spatial trends that persist over the entire area extent and result in positive correlation even at large horizontal lags, except for political behavior.

To determine if spatial autocorrelation is affecting the t-statistics and to get a sense of the similarity between neighboring spatial units while assuming their locations to be exogenous, I calculate Moran's I. To do this, I use the user-written Stata program `spatwmat` from Pisati (2001), and set a band of 1,900 for R and S respectively to meet the technical requirements of the neighborhood matrices. While a Moran's I of $I > E(I)$ indicates positive spatial autocorrelation (near regions tend to show similar values of Y), $I < E(I)$ indicate negative spatial autocorrelation (near regions tend to show dissimilar values of Y). Consequently, values closer to the lower bound -1 indicate spatially dispersed data, those closer to the upper bound $+1$ indicate spatially correlated data, while values around 0 indicate no spillovers and support an $i.i.d.$ assumption. My data (see Table A.3.9 and Table A.3.10 in the Appendix) reject the null hypothesis of spatial independence in both the origin and host regions. The magnitude of the z-scores and p-values suggest that spatial dependence is more pronounced in host regions than in origin regions. In other words, the distribution of high and/or low scores in my data is more spatially clustered than would be expected if the spatial process was random.

1.5.2. Spatial models

However, although Moran's I establishes the presence of global spatial dependence, it does not provide any indication about the correct model specification, which could go beyond the following standard model (Elhorst 2014):

$$Y = \rho \times \text{WY} + \beta X + \theta \times \text{WX} + u \text{ and } u = \lambda \times \text{Wu} + \epsilon \tag{7}$$

where β describes the exogenous variables, ρ the endogenous interaction effects, often referred to as the spatial autoregressive term, θ the exogenous interaction effects (with a dimension equal to the number of exogenous variables K), and finally λ the spatial correlation effect of the errors, known as spatial autocorrelation. Finally, W represents the general expression for the neighborhood or weighting matrix, which in the present case is a spectrally standardized contiguity matrix. Depending on the problem, the type of spatial lag is crucial, of which there are three main types:

Figure 1.5.: Semi-variograms for spatial correlation, local population excluding Slavs

Executed with the user-written program variog2 by Nick Cox
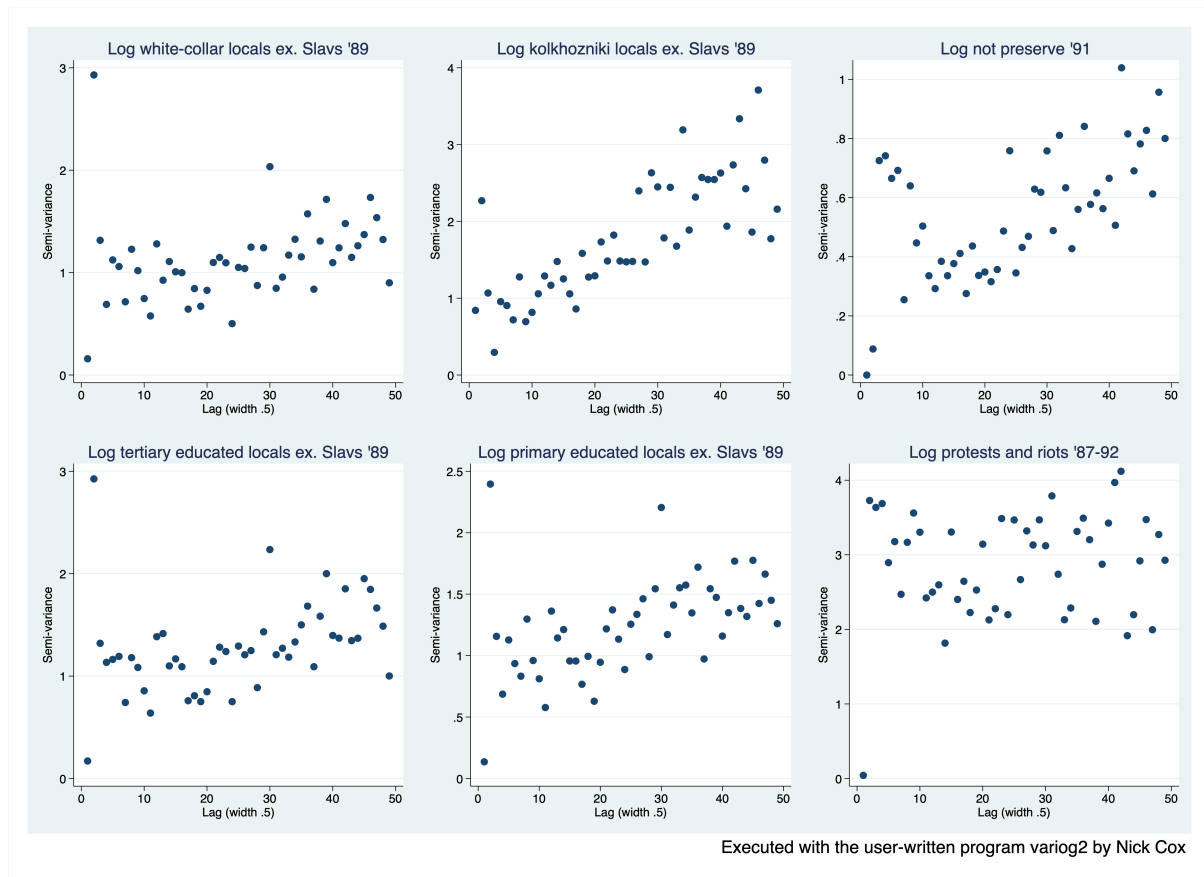
1. Endogenous spatial lag (SAR) models measure the extent to which the outcome in region i is influenced by the outcomes in other regions j (where $j \neq i$). These models are commonly used in studies on defense burdens (Flores 2011; Goldsmith 2007).

2. Spatial lag in the error terms (SEM) models measure the extent to which regions share similar unobserved characteristics or face a similar unobserved environment. These models are not widely used as spatial considerations do not usually play a significant role in the main part of a model (Beck et al. 2006, p. 30).

3. Exogenous spatial lag (SLX) models measure the extent to which the outcome of region i depends on the explanatory variables in other regions j (where $j \neq i$). The maximum number of lags in these models is equal to the number of explanatory variables (K).

In spatial econometrics, selecting the appropriate model and matrix specification from the various models that combine different types of spatial lags can be challenging (Yesilyurt and Elhorst 2017, p. 778). While spatial autoregressive (SAR) and spatial lag in error term (SEM) models are the primary options, they are only an initial step in addressing the issue (Goldsmith 2007, p. 422). Other models, such as the General Nested Spatial Model (GNS), are overparameterized and weakly identifiable, providing no additional information over the SAR or SEM models (Cook et al. 2015; Burridge et al. 2016). Table 1.1 summarizes the most frequently used models in spatial econometrics literature and their ability to identify regional spillovers.

From Table 1.1 it becomes apparent that only models featuring an exogenous spatial lag, such as the Spatial Durbin Model (SDM) or Spatial Durbin Error Model (SDEM), are suitable for this analysis, as they allow for spillovers to take on different values relative to the direct effect between variables.[34] Another important consideration

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[34] The Spatial Error Model (SEM) is not suitable for this purpose, as it places constraints on the parameters that reduce the measurement of regional spillover effects to zero (Beck et al. 2006). Similarly, the Spatial Autoregressive (SAR) and Spatial Autoregressive Conditional Heteroskedasticity (SAC) models produce a proportional relationship between direct and indirect effects that is the same for each variable, which is unlikely to hold in reality.

Table 1.1.: Spatial models with different lags and flexibility for region spillover effects

Model	Spatial lag(s)	Restriction(s)	Flexbility, spillovers
SAR, Spatial autoregr. model	WY	$\theta = 0, \lambda = 0$	Constant ratios, global
SEM, Spatial error model	Wu	$\theta = 0, \rho = 0$	Zero by construction
SLX, Spatial lag of X model	WX	$\rho = \lambda = 0$	Fully flexible, local
SAC, Spatial autoregr. combined model	WY, Wu	$\theta = 0$	Constant ratios, global
SDM, Spatial Durbin model	WY, WX	$\lambda = 0$	Fully flexible, global
SDEM, Spatial Durbin error model	WX, Wu	$\rho = 0$	Fully flexible, local

Source: Yesilyurt and Elhorst (2017) p. 782

is whether spillovers are local or global in nature. Local spillovers occur when changes in the explanatory variable in one region affect the dependent variable in another region, and vice versa. In contrast, global spillovers occur regardless of whether regions are directly connected, whereby changes in the explanatory variable of one region are transmitted to all other regions, even in the absence of a direct connection. In the context of an occupation-skill gradient model, there are two reasons why an SDM may be preferred over an SDEM model. First, the SDM is more robust in cases where there are doubts about the reliability of the available data. Second, the SDM is better equipped to capture global spillovers, which are highly plausible given the global scale of World War II, which linked Soviet regions in European Russia with those in Central Asia (Yesilyurt and Elhorst 2017, p. 782). On the other hand, the ethnic assertiveness of non-Russians in the non-Russian union republics, coupled with the prevalence of local ethnic networks, suggests that an SDEM model would be more appropriate for measuring the legacy of ethnic violence on political behavior.

In order to test for any potential errors caused by the omission of autocorrelation in the error term or dependent variable, I utilize a general-to-specific testing approach based on prior research (Elhorst 2010; Rüttenauer 2022). Firstly, I use a Lagrange multiplier (LM) test on the original non-spatial base model to identify any potential improvements that could be made by including currently omitted variables. Secondly, I use a likelihood ratio (LR) test to compare the Spatial Error Model (SEM) or Spatial Lag Model (SLM) specification to a model with an exogenous spatial lag. The LR test assesses the plausibility of the θ values in the null versus the alternative by comparing the log-likelihoods of the two models. Thirdly, I perform a Bayesian Markov Chain Monte Carlo (MCMC) simulation to differentiate between global and local spillover models. This approach calculates Bayesian posterior model probabilities for both models given a particular neighborhood relationship, and can compare the models across their entire parameter space. The SDM and SDEM models use the same explanatory variables (X and WX) and uniform prior for ρ and λ, so the inferences drawn from the log-likelihood function values are further supported. If the log marginal likelihood value of one model is higher than that of another model, the Bayesian posterior model likelihood is also higher (Elhorst 2019; Elhorst et al. 2020). The selection process is summarized in Table 1.2 and implemented using the `spatdiag` command of Pisati (2001).

Table 1.2.: Diagnostic Dependency Tests

Test	H_0	H_1	Procedures
LM-error test	$\lambda = 0$, given $\rho = 0$	$\lambda \neq 0$	If H_0 is rejected, $\rightarrow$ Spatial Error Model (SEM)
LM-lag test	$\rho = 0$, given $\lambda = 0$	$\rho \neq 0$	If H_0 is rejected, $\rightarrow$ Spatial Lag Model (SLM)
		$\downarrow$	
$\Rightarrow$ If both null hypothesis of the LM-tests are rejected ($\lambda \neq 0$ & $\rho \neq 0$), perform the robust test			
		$\downarrow$	
LR-spatial error	$\theta + \rho\beta = 0$	$\theta + \rho\beta \neq 0$	If H_0 is rejected $\rightarrow$ Spatial Durbin model (SDM)
LR-spatial lag	$\theta = 0$	$\theta \neq 0$	If H_0 is rejected $\rightarrow$ Spatial Durbin model (SDM)
		$\downarrow$	
$\Rightarrow$ Test SDM over SDEM: Bayesian posterior model probabilities			

Adapted from Seilers (2019).

1.5.3. Specifications

Baseline I define the non-spatial OLS starting specification similarly to Acemoglu, Hassan, et al. (2011), which is $\log Y_{i,t} = \alpha_0 + \beta_1 \text{Set}_{i,39\to59} + \gamma_3 X' + \epsilon$, where I regress my outcome variables on the corresponding settler variables, the set of controls, and a constant. I account for heteroskedastic standard errors and use analytical weights from the total population in 1939 in the estimation. After conducting a rigorous test regiment, I find the null hypothesis of spatial independence rejected by the LM test. This indicates that the inclusion of a spatial error term or a dependent spatial lag would lead to significant improvements in the model fit. Moreover, the robust LR test favors the Spatial Durbin Model (SDM) over the Spatial Error Model (SEM) and the Spatial Lag Model with exogenous variables (SLX), which aligns with theoretical assumptions regarding the relationship between employment and skills. Additionally, the Bayesian Markov chain Monte Carlo (MCMC) simulation validates the effectiveness of an SDEM model for analyzing the impact of political behavior, as spillover effects in social conflict dimensions are typically localized. Thus, for the employment and education specification, I specify an SDM model with a spatial lag of both endogenous and exogenous variables, while I utilize an SDEM model for the analysis of political behavior effects.[35]

$$\text{SDM: } \ln Y_{i,t} = \alpha_0 + \beta_1 \text{Set}_{i,39\to59} + \gamma_3 X' + \lambda \mathbf{W^s} \ln Y_{i,t} + \theta \mathbf{W^s} \text{Set}_{i,39\to59} + \epsilon_i \tag{8}$$

$$\text{SDEM: } \ln Y_{i,t} = \alpha_0 + \beta_1 \text{Set}_{i,39\to59} + \gamma_3 X' + \lambda \mathbf{W^s} \ln Y_{i,t} + [...] + \rho \mathbf{W^s} e \tag{9}$$

where $\ln Y_{i,t}$ is the dependent variable at time t in region i and is the logarithm of the decomposed markets on the occupation-qualification gradient for the local non-Slavic and non-settler populations and the two dimensions of social conflict. $\text{Set}_{i,39\to59}$ is a vector of settler variables in locality i at time t representing the change in the proportion of deported persons (either rehabilitated or not) between 1939 and 1959. The $N \times k-1$ matrix X' includes observations on control variables such as war-related casualties, the USSR penal system, prewar controls on the dependent variable, and the proportion of ethnic Russians. The error term is represented by ϵ_i and the constant by α_0. The spatial lags of the endogenous and exogenous regressors, $\mathbf{W^s} \ln Y_{i,t}$ and $\mathbf{W^s}\text{Set}_{i,t}$ and $\mathbf{W^s} \ln Y_{i,t}$ are included in the employment specification. In addition, the spatial lags of the exogenous and error terms, $\lambda \mathbf{W^s} \ln Y_{i,t} + \rho \mathbf{W^s} e$, are added. However, other interaction terms are not included because it is not possible to identify any wage effects within skill groups over time using regional data.

Rehabilitation decree I employ an instrumental variables approach to address the endogeneity of return migration of rehabilitated ethnic groups. Specifically, I use the total change in rehabilitated settler ethnic groups from 1939 to 1959 as an instrument for the logarithm of the rehabilitated settler ethnic groups in region i at time t. This is because the resettlement of ethnic groups may influence their preference to settle near other members of their ethnic group, and the absence of older communities can predict supply changes among rehabilitated settlers (Peri 2014, p. 3). By isolating the part of the return migration determined by the supply decisions of the rehabilitated ethnic groups, this instrumented variable accounts for the exogenous variation arising from the deportation experience and has significant effects on both my endogenous variable and the outcome of interest, as confirmed in Table A.3.13 in the Appendix. Moreover, I satisfy the stable treatment value assumption (SUTVA), which requires individuals within a given ethnic group to be equally exposed to treatment, i.e., deportation and subsequent rehabilitation. For the employment-education specification, the instrumented variable represents the effect of rehabilitated settlers who have not yet returned to their ancestral lands in the host regions, while in the origin regions, it represents the share of returnees. First stage results as shown in Table 1.3 confirm the robustness of effects for both the origin and host regions, leading to the formulation of a specific rehabilitation decree function as follows:

$$\text{SDM-IV: } \ln Y_{i,t} = \alpha_0 + \beta_1 \ln\left(\widehat{R}_{i,t}\right) + \beta_2 \text{Set}_{i,39\to59} + \gamma_3 X' + \lambda \mathbf{W^s} \ln Y_{i,t} + \theta \mathbf{W^s} \text{Set}_{i,39\to59} + \epsilon_i \tag{10}$$

where the dependent variable, $\ln Y_{i,t}$, represents the logarithm of prewar control for white-collar and collective farm employment, tertiary and primary education in region i at time t for the local non-Slavic population. The instrumental variable, $\ln \widehat{R}_{i,t}$, represents the share of rehabilitated settler ethnic groups in region i at time t, which is

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[35] The results of the Bayesian MCMC simulation are available upon request.

instrumented with the change in rehabilitated "special settlers" between 1939 and 1959 (the migration shock/collapse), denoted $\Delta R_{i,39\to53}$. I include a matrix of control variables, X', with N rows and $k-1$ columns, and a placeholder variable, $\text{Set}_{i,39\to59}$, which represents the change in permanently displaced ethnicities in the host regions, denoted $\Delta E_{i,39\to53}$, and the total population collapse, denoted $\Delta\text{Set}_{i,39\to53}$, for the origin regions. The model also incorporates ethnically based explanatory variables, such as deportees with ancestral territories outside the core Soviet Union, culturally advanced ethnic groups in 1926, and the proportion of Germans and Protestants among the deportees. Spatial lags, denoted as $\mathbf{W}^s \ln Y_{i,t}$ and $\mathbf{W}^s\text{Set}_{i,t}$, are included for both endogenous and exogenous variables.

Table 1.3.: First stage results for the rehabilitation decree specifications

	Log of rehabilitated settler ethnicities in:			
	1959	1970	1979	1989
Panel A: Results for the origin regions				
Change in rehabilitated '39-59 '	−0.003	−0.082***	−0.066***	−0.043*
	(0.040)	(0.019)	(0.023)	(0.022)
Log Russians	0.246	0.109	0.181	0.228
	(0.484)	(0.207)	(0.235)	(0.233)
Log rehabilitated '39	0.703***	0.455***	0.535***	0.477***
	(0.115)	(0.054)	(0.065)	(0.065)
Overall population change '39-59	−2.019***	1.428***	1.148***	0.026
	(0.717)	(0.334)	(0.399)	(0.385)
Controls	✓	✓	✓	✓
Observations	43	43	43	43
Pseudo R^2	0.82	0.95	0.93	0.92
Panel B: Results for the host regions				
Change in rehabilitated '39-59 '	0.543***	0.410***	0.356***	0.255***
	(0.122)	(0.078)	(0.078)	(0.072)
Log Russians	1.924***	0.142	0.242	0.246
	(0.353)	(0.180)	(0.189)	(0.165)
Log rehabilitated '39	0.096	−0.121	−0.063	−0.035
	(0.181)	(0.125)	(0.124)	(0.113)
Overall population change '39-59	0.456	0.392	0.619**	0.376
	(0.397)	(0.263)	(0.257)	(0.239)
Controls	✓	✓	✓	✓
Observations	55	55	55	55
Pseudo R^2	0.83	0.80	0.76	0.72

Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

First-stage results are obtained using `gs2sls` estimator. All specifications contain a constant term, the German Occupation Dummy, Change in Percent of Jewish Pop. '39 to '59, Log Perc. of the Russian population in 1989, as well as controls for log urban population 1939, the longitude and latitude of the oblast capital, controls for growth in both the defense industry (Growth Defense Industry '39 to '59 less relocated defense facilities) and penal labor camps (Gulags). It further includes to the log of the total population loss '39-'59.

Two account for spatial dependence, I employ two different estimators: the generalized moment estimator `gs2sls` proposed by Kelejian and Prucha (1998), and the maximum likelihood estimator `ml` proposed by Anselin (1988). While the `gs2sls` estimator only requires the assumption of independent and identically distributed error terms, the `ml` estimator assumes both normality and independent and identically distributed errors. In terms of robustness checks, while both the `ml` and the `gs2sls` estimators produce similar results, the `ml` estimator is preferred due to its ability to provide smaller standard errors when the errors follow a normal distribution, thus ensuring consistency and accuracy. However, for the main spatial IV models, the `gs2sls` estimator is utilized because of its effectiveness.

1.6. Results

1.6.1. Origin Regions

Distributional effects

Tables 1.4 to 1.8 show the distributional effects of the highest and lowest gradient of occupational skill over the 1939-89 census periods. Figure A.2.4 in the Appendix shows the corresponding coefficient plots, which provide a graphical representation of the observed patterns. My results indicate that the rate of return of ethnic groups to their origin regions had a significant impact on the local economy. While growing interest in higher education is associated with an expansion of the local white-collar and higher education sectors, a countermovement in the collective agricultural employment sector is observable.

Table 1.4.: Results: White-collar locals ex. Slavs, origin regions

	Dependent variable in the Soviet censuses			
	1959	1970	1979	1989
Log returnees	0.041***	0.073***	0.050**	0.101***
	(0.010)	(0.015)	(0.023)	(0.021)
Log averted deportation	0.019	−0.013	0.017	0.034
	(0.020)	(0.024)	(0.041)	(0.038)
Log Russians	0.194***	0.170***	0.410***	0.306***
	(0.048)	(0.042)	(0.050)	(0.052)
Log white-collar workers '39	−0.018	−0.070	−0.002	0.117**
	(0.056)	(0.049)	(0.080)	(0.057)
Spatial lag: Dependent Variable	−0.024	−0.015	−0.013	−0.031
	(0.020)	(0.020)	(0.030)	(0.027)
Controls	✓	✓	✓	✓
Observations	43	43	43	43
Pseudo R^2	0.99	0.99	0.98	0.99
Chi-squared	5017.541	4982.230	2107.704	2853.690
Wald Test	0.011	0.017	0.822	0.004

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

All specifications contain a constant term, the German Occupation Dummy, Change in Percent of Jewish Pop. '39 to '59, Log Perc. of the Russian population in 1989, as well as controls for log urban population 1939, log total population in the indicated year, the longitude and latitude of the oblast capital, controls for growth in both the defense industry (Growth Defense Industry '39 to '59 less relocated defense facilities) and penal labor camps (Gulags). It further includes to the log of the total population loss '39-'59.

Table 1.4 provides estimates for the highest employment levels in each census year. I find that a higher regional presence of returning ethnic groups led to an increase in local white-collar employment of about 0.04% in 1959. This gradually increased in subsequent census periods, reaching a statistically highly significant 0.10% in 1989. The expansion in the tertiary education sector was even more remarkable, with an increase of 0.17% in the 1989 census period, as shown in Table 1.5. In addition, the proportion of individuals evading deportation predicts a significant decline in the higher education of non-Slavs. Specifically, in all census periods except for 1979, a highly significant decrease in their tertiary education of at least 0.1% is associated with an increase by about 1% of targeted ethnicities who evaded deportation.

However, it is important to note that this trend does not apply to all ethnic groups, as demonstrated in Table 1.6. In fact, the trend is even more pronounced for the ethnic groups with ancestral lands outside the core territory of the Soviet Union, such as Germans, Meskhetian Turks, and Koreans, whose presence in the local area is associated with a highly significant decrease of about 0.12% in the share of tertiary educated non-Slavs in their origin region. This serves as a clear counterbalance to the success of the returning ethnic groups, particularly considering that the purges affected nearly all groups, and those who evaded deportation were only a small minority. Furthermore, the impact of the deportation campaigns that occurred from 1939 to 1959, which resulted in a direct loss of population

Table 1.5.: Results: Tertiary educated locals ex. Slavs, origin regions

	Dependent variable in the Soviet censuses			
	1959	1970	1979	1989
Log returnees	0.044***	0.107***	0.080***	0.172***
	(0.015)	(0.023)	(0.024)	(0.020)
Log averted deportation	−0.100***	−0.125***	−0.044	−0.112***
	(0.031)	(0.039)	(0.047)	(0.039)
Log Russians	0.064	0.110*	0.298***	0.092*
	(0.073)	(0.063)	(0.059)	(0.053)
Log tertiary educated '39	0.571***	0.438***	0.293***	0.342***
	(0.102)	(0.102)	(0.097)	(0.068)
Spatial lag: Dependent Variable	−0.032	−0.040	−0.037	−0.052*
	(0.034)	(0.032)	(0.034)	(0.028)
Controls	✓	✓	✓	✓
Observations	43	43	43	43
Pseudo R^2	0.98	0.98	0.98	0.99
Chi-squared	2028.150	2210.177	1683.939	2910.691
Wald Test	0.641	0.347	0.558	0.002

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

All specifications contain a constant term, the German Occupation Dummy, Change in Percent of Jewish Pop. '39 to '59, Log Perc. of the Russian population in 1989, as well as controls for log urban population 1939, log total population in the indicated year, the longitude and latitude of the oblast capital, controls for growth in both the defense industry (Growth Defense Industry '39 to '59 less relocated defense facilities) and penal labor camps (Gulags). It further includes to the log of the total population loss '39-'59.

in the origin regions, did not contribute to this trend. Thus, it can be inferred that the primary cause of the negative impact on the highest skill groups is discrimination carried out through state-sponsored violence in the Soviet Union.

Tables 1.7 and 1.8 present the impact of the rehabilitation decree on the lowest employment and education categories. The results indicate a significant decline in collective farm employment of local non-Slavs, which was more substantial than the increase in their white-collar employment. Specifically, a 1% increase in the regional presence of rehabilitated ethnic groups in 1979 resulted in a 0.19% decline in collective farm employment and a 0.2% decline in 1989, while white-collar employment only increased by 0.11%. The absence of a similar trend in the primary education sector suggests that the returning ethnic groups played a crucial role in professionalizing the local labor force. Additionally, my analysis does not find any evidence of targeted ethnicities who avoided deportation into the origin region's collective farm or primary education.

The fact that deported populations left behind their physical assets, which were either unused or replaced by compensating migrants, indicates that administrative regulations, and physical capital destruction alone cannot fully explain the regional development differences in the long run. My findings suggest that the 1956 rehabilitation decree had a positive impact on higher education and white-collar employment in the regions of origin, particularly for the four ethnic groups that were fully rehabilitated. These benefits are still evident almost five decades after deportation, indicating that these groups may have developed a stronger preference for postsecondary education, leading to better employment outcomes. My findings support the capital flight hypothesis for rehabilitated ethnic groups, which were more mobile and may have transmitted migration-related values across generations, resulting in altered educational preferences in origin communities (Becker, Grosfeld, et al. 2020). This shift in educational preferences may be linked to social capital, migration, and the potential long-term attachment of returning populations to their places of origin.

However, my analysis also finds that the rehabilitation process did not benefit all ethnic groups equally. Meskhetian Turks, Germans, and Koreans, whose ancestral lands were outside the Soviet Union, were not included in the rehabilitation process and were discriminated against. This negatively affected their access to higher education and white-collar employment, with long-term consequences for their social and economic mobility. It is worth noting that ethnic Germans in the mid-1920s placed great emphasis on education and technical skills, while Koreans were known for their skills in agriculture and fishing. Table 1.9 shows very impressively that those who stayed in their

Table 1.6.: Targeted ethnicities in the highest education-employment category, origin regions

Dependent Variable is the Log of:	Dependent variable in the Soviet censuses			
	1959	1970	1979	1989
Panel A: White-collar employment				
Averted deportation (all)	0.019	−0.013	0.017	0.034
Excl. Germans	0.031*	0.021	0.035	0.056
With ancestral lands	0.025	−0.005	0.012	0.020
Advanced in 1926	−0.017	−0.064**	−0.056	−0.031
Germans	−0.005	−0.051*	−0.067*	−0.055*
Protestants	0.015	−0.019	−0.065*	−0.049
Overall shock in deportees 1939-59	−0.001	−0.000	0.003	0.000
Panel B: Tertiary education				
Averted deportation (all)	−0.100***	−0.125***	−0.044	−0.112***
Excl. Germans	0.003	−0.074*	−0.021	−0.058
With ancestral lands	−0.092***	−0.121***	−0.054	−0.132***
Advanced in 1926	−0.114***	−0.117***	−0.031	−0.055
Germans	−0.108***	−0.115**	−0.063	−0.090**
Protestants	−0.097***	−0.136***	−0.073	−0.098***
Overall shock in deportees 1939-59	0.008*	0.007	0.007	0.007*
Geographic and violence controls	✓	✓	✓	✓

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. The explanatory variables comprise the complete set of targeted ethnicities, including those with ancestral lands outside the core Soviet Union (Germans, Meskhetian Turks, and Koreans), culturally advanced ethnicities in 1926 (Germans and Crimean Tatars), the share of Germans, and the share of Protestants among targeted ethnicities (specifically Germans and Koreans). All specifications contain a constant term, the German Occupation Dummy, Change in Percent of Jewish Pop. '39 to '59, Log Perc. of the Russian population in 1989, as well as controls for log urban population 1939, log total population in the indicated year, the longitude and latitude of the oblast capital, controls for growth in both the defense industry (Growth Defense Industry '39 to '59 less relocated defense facilities) and penal labor camps (Gulags). It further includes to the log of the total population loss '39-'59.

host regions had no significant impact, positive or negative, anymore on both primary education and collective agricultural employment.

The reliability of my findings is underscored by Figure A.2.4 in the Appendix, which shows narrow confidence intervals and significant economic effects of the estimates. These estimates are stable and not affected by political or institutional changes in the Soviet Union or the rapidly changing macroeconomic environment under Gorbachev. Instead, the results suggest that individuals who returned to their origin regions passed on migration-related values to their offspring, resulting in a change in preferences for higher education. The social capital literature supports this idea by indicating that higher levels of education contribute to and rely on social capital (Glaeser et al. 2002; Putnam et al. 1994). It is important to note that the causal estimates may be overestimated because the rehabilitated ethnic groups were among the more mobile populations in the former host region. Further research is necessary to investigate self-selection and ethnic self-assertion among those who returned, providing a better understanding of the results. Despite these limitations, my findings suggest that the rehabilitation process contributed to increased return migration and attachment of populations to their regions.

Social conflict

Tables **??** and **??** present my results on the impact of the 1991 referendum and protest participation in the regions of origin of the former Soviet Union. In columns 1 through 4 of both tables, I report the results of the instrumented SDEM-IV least squares model, which is compared to the non-instrumented model in column 5. The spillover effects are detailed in Tables A.3.15 and A.3.17.

Columns 1-4 of Table **??** focus on the impact of the size of the rehabilitated ethnic groups and ethnic groups that escaped deportation on the 1991 referendum elections. My findings reveal that the ethnic groups that avoided

Table 1.7.: Results: Kolkhozniki locals ex. Slavs, origin regions

	Dependent variable in the Soviet censuses			
	1959	1970	1979	1989
Log returnees	−0.070*	−0.071	−0.189***	−0.198***
	(0.040)	(0.067)	(0.064)	(0.071)
Log averted deportation	0.056	−0.100	0.127	0.098
	(0.067)	(0.115)	(0.137)	(0.143)
Log Russians	0.130	0.217	0.670***	0.689***
	(0.160)	(0.191)	(0.180)	(0.206)
Log collective farm workers '39	0.252**	0.156	0.341***	0.305**
	(0.112)	(0.125)	(0.121)	(0.122)
Spatial lag: Dependent Variable	0.031	−0.033	−0.063	−0.057
	(0.071)	(0.092)	(0.097)	(0.099)
Controls	✓	✓	✓	✓
Observations	43	43	43	43
Pseudo R^2	0.91	0.90	0.91	0.89
Chi-squared	437.070	382.386	410.241	353.177
Wald Test	0.056	0.242	0.429	0.114

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

All specifications contain a constant term, the German Occupation Dummy, Change in Percent of Jewish Pop. '39 to '59, Log Perc. of the Russian population in 1989, as well as controls for log urban population 1939, log total population in the indicated year, the longitude and latitude of the oblast capital, controls for growth in both the defense industry (Growth Defense Industry '39 to '59 less relocated defense facilities) and penal labor camps (Gulags). It further includes to the log of the total population loss '39-'59.

Table 1.8.: Results: Primary educated locals ex. Slavs, origin regions

	Dependent variable in the Soviet censuses			
	1959	1970	1979	1989
Log returnees	0.030**	0.059***	0.039*	0.021
	(0.015)	(0.014)	(0.024)	(0.030)
Log averted deportation	−0.002	−0.009	0.035	0.044
	(0.031)	(0.027)	(0.050)	(0.058)
Log Russians	0.310***	0.265***	0.397***	0.360***
	(0.077)	(0.044)	(0.066)	(0.086)
Log primary educated '39	0.073	0.103**	0.235***	0.299***
	(0.070)	(0.044)	(0.070)	(0.076)
Spatial lag: Dependent Variable	−0.058*	−0.011	−0.008	−0.004
	(0.035)	(0.022)	(0.036)	(0.041)
Controls	✓	✓	✓	✓
Observations	43	43	43	43
Pseudo R^2	0.98	0.99	0.97	0.97
Chi-squared	1803.591	4185.508	1472.635	1233.675
Wald Test	0.098	0.233	0.854	0.903

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

All specifications contain a constant term, the German Occupation Dummy, Change in Percent of Jewish Pop. '39 to '59, Log Perc. of the Russian population in 1989, as well as controls for log urban population 1939, log total population in the indicated year, the longitude and latitude of the oblast capital, controls for growth in both the defense industry (Growth Defense Industry '39 to '59 less relocated defense facilities) and penal labor camps (Gulags). It further includes to the log of the total population loss '39-'59.

deportation did not display any significant changes in voting behavior, either in terms of stronger support or rejection of the Soviet Union during the referendum. This lack of effect persists even after various controls are added, indicating that groups such as ethnic Germans, Meskhetian Turks, Crimean Tatars, and Koreans did not identify themselves as supporters or opponents of the Soviet Union, despite their shared experiences of marginalization. However, the

Table 1.9.: Targeted ethnicities in the lowest education-employment category, origin regions

	Dependent variable in the Soviet censuses			
Dependent Variable is the Log of:	1959	1970	1979	1989
Panel A: Collective farm employment				
Averted deportation (all)	0.056	−0.100	0.127	0.098
Excl. Germans	−0.031	−0.126	0.049	0.026
With ancestral lands	0.079	−0.070	0.172	0.222
Advanced in 1926	0.084	−0.088	−0.131	−0.134
Germans	0.137*	−0.011	−0.058	−0.001
Protestants	0.114*	−0.127	−0.101	−0.044
Overall shock in deportees 1939-59	0.012	0.011	0.004	0.015
Panel B: Primary education				
Averted deportation (all)	−0.002	−0.009	0.035	0.044
Excl. Germans	0.037	−0.046*	−0.005	−0.058
With ancestral lands	0.012	0.009	0.048	0.091
Advanced in 1926	−0.039	−0.030	−0.056	−0.038
Germans	−0.015	0.018	−0.028	0.027
Protestants	0.013	0.044	−0.017	0.047
Overall shock in deportees 1939-59	−0.001	0.003	0.004	0.003
Geographic and violence controls	✓	✓	✓	✓

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. The explanatory variables comprise the complete set of targeted ethnicities, including those with ancestral lands outside the core Soviet Union (Germans, Meskhetian Turks, and Koreans), culturally advanced ethnicities in 1926 (Germans and Crimean Tatars), the share of Germans, and the share of Protestants among targeted ethnicities (specifically Germans and Koreans). All specifications contain a constant term, the German Occupation Dummy, Change in Percent of Jewish Pop. '39 to '59, Log Perc. of the Russian population in 1989, as well as controls for log urban population 1939, log total population in the indicated year, the longitude and latitude of the oblast capital, controls for growth in both the defense industry (Growth Defense Industry '39 to '59 less relocated defense facilities) and penal labor camps (Gulags). It further includes to the log of the total population loss '39-'59.

number of interethnic contacts maintained by these groups might have influenced their voting behavior. However, my analysis indicates that ethnic groups that avoided deportation were not more or less likely to secede if they had more contacts with other ethnic groups, as indicated by the between-group interaction variable and the contemporaneous polarization index, both of which were non-significant. The size of the rehabilitated ethnic groups also did not significantly influence their support for secession from the Soviet Union. This finding challenges the widely held belief that educated minorities are more supportive of democratic change, as suggested by Acemoglu, Hassan, et al. (2011). Moreover, the voting behavior of ethnic Russians indicated a stronger affirmation of the Soviet polity, which was likely influenced by their prospective minority status in increasingly independent republics.[36]

In Table **??**, shows the coefficients for protest and riot behavior in the late Soviet Union based on Beissinger (2002). My results contrast with previously observed lack of voting effects among ethnic groups that escaped deportation and rehabilitated ethnicities. Specifically, an increase in the regional presence of targeted ethnicities who avoided deportation by 1% is associated with a 3.5% increase in protest and violent behavior. This finding is particularly surprising and may be related to a discrepancy between beliefs and reality in socialist electoral systems. My findings indicate that descendants of affected ethnic groups became increasingly active in protecting their ethnic group. Moreover, returnees were associated with lower protest and riot behavior in their regions of origin, with a 1% increase in their regional representation leading to a 0.4% decrease in protests and riots. When controlling for socioeconomic success, my study found that returnees in white-collar positions played a dominant role in outwardly expressing dissatisfaction, with an increase in their size resulting in a 2.6% increase in protest behavior, a magnitude about seven times larger than that of returnees in general (0.4%). Notably, the size of the worker and collective farm worker

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[36] Note that the results presented in column 5 show a significant effect, but it is not detected in any other robustness estimate and therefore considered a statistical artifact. For further details, refer to Table A.3.14 in the Appendix.

	Spatial Durbin Error Model (SDEM-IV)				SDEM
	(1)	(2)	(3)	(4)	(5)
Log avoided deportation '89'	0.108	−0.047	−0.365	−0.661	−0.995**
	(0.135)	(0.123)	(0.417)	(0.530)	(0.483)
Log returnees '89'	−0.073	0.013	0.004	−0.041	0.139
	(0.058)	(0.054)	(0.055)	(0.082)	(0.090)
Log Russians '89		−0.561***	−0.582***	−0.530***	−0.706***
		(0.163)	(0.164)	(0.199)	(0.213)
Polarization index '89		−0.720	−0.760	−0.338	−1.099*
		(0.473)	(0.473)	(0.550)	(0.611)
Log between-group IA, avoided dep. '89'			0.310	0.594	0.682
			(0.389)	(0.502)	(0.432)
Log white-collar returnees '89				1.161	0.553
				(0.741)	(0.645)
Log blue-collar returnees '89				−1.069	−0.454
				(0.825)	(0.708)
Log kolkhozniki returnees '89				−0.073	−0.018
				(0.126)	(0.116)
Spatial lag: Dependent Variable	−0.356*	−0.099	−0.114	−0.318	0.252
	(0.215)	(0.191)	(0.190)	(0.220)	(0.288)
Geogr. and violence controls	✓	✓	✓	✓	✓
Observations	43	43	43	43	43
Pseudo R^2	0.14	0.31	0.32	0.36	0.19
Chi-squared	8.552	22.214	23.170	27.519	54.666

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. All specifications contain a constant term, the German Occupation Dummy, Change in Percent of Jewish Pop. '39 to '59, Log Perc. of the Russian population in 1989, as well as controls for log urban population 1939, log total population in the indicated year, the longitude and latitude of the oblast capital, controls for growth in both the defense industry (Growth Defense Industry '39 to '59 less relocated defense facilities) and penal labor camps (Gulags). It further includes to the log of the total population loss '39-'59. Dependent variable is the inverted (!) log percentage of votes in favor of preserving the Soviet Union in 1991, that is the secessionist voting behavior.

populations did not reduce the overall effect of protests and unrest, although they accounted for 2.3% and 0.6% of the population, respectively.

To gain a more nuanced understanding of the voting and protesting effects, Table ?? decomposes the settler variable into different subgroups. The findings reveal a positive relationship between ethnic groups that escaped deportation and their support for the Soviet Union, especially among those considered culturally advanced in 1926, such as Ukrainians and Germans. However, their descendants voted for secession from the Soviet Union, with a smaller effect size of 0.5% and a significance level of 10%. It is also unlikely that minority status influenced their voting behavior, as they still lived in their original homelands, and there was no significant interaction between the groups that could have affected their decisions. The 1989 polarization index, which measures the extent to which individuals are distributed among different ethnic groups, did not affect the results. However, the voting behavior of this group contradicts their protest behavior, as regions with a higher proportion of ethnicites considered culturally advanced in 1926, had stronger protest and riot effects. The effect was particularly strong for Protestants within the origin regions, that is for Koreans and ethnic Germans, with a 1% increase in their size leading to an 0.8% increase in their propensity to protest and riot, making them an important driver of the overall effect. The table also confirms significant spillover effects for ethnic groups that evaded deportation and for interethnic contacts, amplifying the direct effects in both directions. The overall ethnic-based effect was 3.8% (with a direct effect of 3.5%), and the interethnic contact effect was almost 3%, as shown in Table A.3.17.

The long-term effects of World War II, including changes in culture, administration, and physical destruction, do not fully explain the observed outcomes (Grosfeld, Rodnyansky, et al. 2013; Becker and Woessmann 2009; Dell 2010). Instead, my study suggests that returnees' attachment to their ancestral country may have increased in the long run, even though the environment was more secure and allowed for rejection. This stronger attachment could be due to self-selection among the more mobile returnees, who passed down education-related values associated with deportation through generations. Theoretical models predict that the destruction and subsequent reconstruction of

	Spatial Durbin Error Model (SDEM-IV)				SDEM
	(1)	(2)	(3)	(4)	(5)
Log avoided deportation '89'	0.790***	0.481*	3.655***	3.436***	3.475***
	(0.296)	(0.271)	(0.818)	(0.861)	(0.869)
Log returnees '89'	−0.364***	−0.187	−0.064	−0.357**	−0.330**
	(0.132)	(0.126)	(0.113)	(0.149)	(0.148)
Log Russians '89		−1.327***	−1.211***	−0.913***	−0.936***
		(0.367)	(0.316)	(0.348)	(0.348)
Polarization index '89		0.268	0.706	1.571*	1.463*
		(1.006)	(0.859)	(0.825)	(0.861)
Log between-group IA, avoided dep. '89'			−3.048***	−2.859***	−2.910***
			(0.756)	(0.814)	(0.825)
Log white-collar returnees '89				2.611**	2.505**
				(1.130)	(1.134)
Log blue-collar returnees '89				−2.233*	−2.117
				(1.295)	(1.293)
Log kolkhozniki returnees '89				−0.654***	−0.646***
				(0.201)	(0.203)
Spatial lag: Dependent Variable	0.185	−0.017	−0.244	0.173	0.111
	(0.274)	(0.249)	(0.222)	(0.237)	(0.221)
Geogr. and violence controls	✓	✓	✓	✓	✓
Observations	43	43	43	43	43
Pseudo R^2	0.51	0.63	0.72	0.78	0.78
Chi-squared	48.393	80.278	132.211	251.883	231.723

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. All specifications contain a constant term, the German Occupation Dummy, Change in Percent of Jewish Pop. '39 to '59, Log Perc. of the Russian population in 1989, as well as controls for log urban population 1939, log total population in the indicated year, the longitude and latitude of the oblast capital, controls for growth in both the defense industry (Growth Defense Industry '39 to '59 less relocated defense facilities) and penal labor camps (Gulags). It further includes to the log of the total population loss '39-'59. Dependent variable is the log number of protests and riots between 1987 and 1992 based on Beissinger (2002).

local social capital among rehabilitated ethnic groups may have placed them in a balance of high social capital and low mobility (David et al. 2010; Bräuninger and Tolciu 2011).

1.6.2. Host Regions

Distributional Effects

Tables 1.10 to 1.14 present estimates for the highest and lowest occupational and educational levels for local non-Slavs in the host regions, taking into account prewar trends in white-collar employment and higher education, as well as the percentage of ethnic Russians in the host regions for each reference year. Despite significant social changes in the host regions after the permanent displacement of certain groups, my results show that the understratification by permanently exiled ethnic groups had no significant impact on white-collar employment and higher education in these regions. This finding is surprising and suggests that the influx of millions of people in low-class employment was not sufficient did not create more opportunities in education and employment for the non-Slavic local population. This conjecture is illustrated in Figure A.2.5 in the Appendix.

Based on the results presented in Table 1.11, rehabilitated ethnic groups exhibit higher levels of education in the host regions, with a significant increase of 0.7% in 1979, 0.6% in 1979 and 0.08% in 1989. This finding suggests that the descendants of the rehabilitated groups who remained in the host regions continue to benefit from their rehabilitation and equality with the Soviet population by accumulating more higher education. These results further support the liberating effects of the rehabilitation decree, particularly when compared with similar estimates for the origin regions. However, the limited employment effects, as demonstrated in Table 1.10, indicate that higher education was initially acquired mainly for purposes other than material wealth, and that it took time to translate into economic prosperity. Notably, only in the late Soviet Union did rehabilitated ethnic groups play a highly significant role in promoting white-collar employment, suggesting that it took approximately two generations for

	Spatial Durbin Error Model (SDEM-IV)			
	(1)	(2)	(3)	(4)
Panel A: Secessionist Voting in 1991				
Log averted deportation '89'	0.108	−0.047	−0.365	−0.661
Excl. Germans	0.183	−0.005	0.005	−0.208
With ancestral lands	0.141	0.031	0.188	0.549*
Advanced '26'	−0.050	−0.012	−0.007	−0.067
Germans	−0.222**	−0.098	−0.143	−0.126
Protestants	−0.236**	−0.109	−0.178	−0.186
Overall shock in deportees 1939-59	0.001	−0.007	−0.008	−0.005
Panel B: Protesting and Rioting 1987-92				
Log averted deportation '89'	0.790***	0.481*	3.655***	3.436***
Excl. Germans	1.011***	0.741***	1.081***	0.543
With ancestral lands	0.353	0.111	−0.306	0.613
Advanced '26'	0.383	0.482**	0.647**	0.474*
Germans	−0.299	0.105	0.012	0.390
Protestants	−0.162	0.318	0.375	0.788***
Overall shock in deportees 1939-59	−0.024	−0.030	−0.027	0.003
Employment controls	–	–	–	✓
Log Russians	–	✓	✓	✓
Polarization Index	–	✓	✓	✓
Geographic and violence controls	✓	✓	✓	✓

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. The explanatory variables comprise the complete set of targeted ethnicities, including those with ancestral lands outside the core Soviet Union (Germans, Meskhetian Turks, and Koreans), culturally advanced ethnicities in 1926 (Germans and Crimean Tatars), the share of Germans, and the share of Protestants among targeted ethnicities (specifically Germans and Koreans). All specifications contain a constant term, the German Occupation Dummy, Change in Percent of Jewish Pop. '39 to '59, Log Perc. of the Russian population in 1989, as well as controls for log urban population 1939, log total population in the indicated year, the longitude and latitude of the oblast capital, controls for growth in both the defense industry (Growth Defense Industry '39 to '59 less relocated defense facilities) and penal labor camps (Gulags). It further includes to the log of the total population loss '39-'59.

them to reap the benefits of their higher levels of education, as shown in Figure A.2.5. Only in 1989, a 1% increase in their regional presence is associated with an increase in white-collar employment of about 0.06%.

After analyzing ethnicity categories in greater detail, a remarkable discovery has emerged. According to Table 1.12, the presence of Germans in the host regions of Central Asia and Siberia has a significant negative impact on white-collar employment. Specifically, a 1% increase in the German population leads to a statistically significant decrease in white-collar employment of approximately 0.08%. This phenomenon is also observed among ethnicities that were regarded as culturally advanced in 1926, as defined by nationality policies in the early Soviet Union. When the combined effect of ethnic Germans and Crimean Tatars is taken into account, it leads to a decrease in white-collar employment of about 0.05%. Additionally, the impact on the tertiary education sector is of the same economic magnitude and statistical significance as it is on white-collar employment for both ethnicities. While my findings may seem astonishing, they are not entirely surprising given the long-standing discrimination against these ethnic groups. The statistical data quantifies the extent to which their access to better employment opportunities and educational pathways has been limited, resulting in obstacles to their career advancement and education. Furthermore, as members of minority groups, they may have also encountered additional challenges, such as cultural differences, which could have further restricted their opportunities for progress.

Upon examining Table 1.13 and Table 1.14, I do not observe any significant impact of permanently displaced and rehabilitated groups on employment levels in the agricultural and primary education sectors from 1970 to 1989. It is important to note that other factors, such as resource availability and infrastructure in different regions, may have influenced these findings. Additionally, regarding the rehabilitated ethnic groups, I find a statistically significant effect only in the immediate post-war period. Specifically, a 1% increase in their presence in the host regions was

Table 1.10.: Results: White-collar locals ex. Slavs, host regions

	Dependent variable in the Soviet censuses			
	1959	1970	1979	1989
Log rehabilitated	−0.003	−0.004	0.007	0.055**
	(0.015)	(0.031)	(0.027)	(0.028)
Log exiled	0.007	0.006	−0.015	−0.037
	(0.015)	(0.023)	(0.025)	(0.026)
Log Russians	0.073	0.133***	0.017	0.013
	(0.046)	(0.041)	(0.037)	(0.034)
Log white-collar workers '39	0.235***	0.255***	0.201***	0.072
	(0.054)	(0.069)	(0.060)	(0.058)
Spatial lag: Dependent Variable	−0.029*	−0.030	−0.014	0.010
	(0.017)	(0.024)	(0.021)	(0.021)
Controls	✓	✓	✓	✓
Observations	55	55	55	55
Pseudo R^2	0.99	0.98	0.98	0.99
Chi-squared	4666.777	2276.805	3115.004	3779.196
Wald Test	0.124	0.180	0.185	0.843

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

All specifications contain a constant term, the German Occupation Dummy, Change in Percent of Jewish Pop. '39 to '59, Log Perc. of the Russian population in 1989, as well as controls for log urban population 1939, log total population in the indicated year, the longitude and latitude of the oblast capital, controls for growth in both the defense industry (Growth Defense Industry '39 to '59 less relocated defense facilities) and penal labor camps (Gulags). It further includes to the log of the total population loss '39-'59.

Table 1.11.: Results: Tertiary educated locals ex. Slavs, host regions

	Dependent variable in the Soviet censuses			
	1959	1970	1979	1989
Log rehabilitated	0.033	0.069*	0.059**	−0.053
	(0.032)	(0.035)	(0.026)	(0.096)
Log exiled	0.024	−0.015	−0.024	0.036
	(0.040)	(0.027)	(0.025)	(0.092)
Log Russians	0.085	0.157***	0.061	0.185
	(0.110)	(0.048)	(0.039)	(0.121)
Log tertiary educated '39	0.398***	0.488***	0.385***	0.304*
	(0.115)	(0.070)	(0.052)	(0.173)
Spatial lag: Dependent Variable	−0.029	−0.048*	−0.024	0.137*
	(0.046)	(0.028)	(0.021)	(0.076)
Controls	✓	✓	✓	✓
Observations	55	55	55	55
Pseudo R^2	0.94	0.97	0.98	0.86
Chi-squared	849.401	1871.288	3306.697	338.134
Wald Test	0.686	0.209	0.543	0.192

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

All specifications contain a constant term, the German Occupation Dummy, Change in Percent of Jewish Pop. '39 to '59, Log Perc. of the Russian population in 1989, as well as controls for log urban population 1939, log total population in the indicated year, the longitude and latitude of the oblast capital, controls for growth in both the defense industry (Growth Defense Industry '39 to '59 less relocated defense facilities) and penal labor camps (Gulags). It further includes to the log of the total population loss '39-'59.

associated with a 0.1% increase in collective farm employment, which is ten times larger than the effect found in primary education (0.013%).

Table 1.15 reveals an unexpected positive impact of ethnic Germans on the collective farm sector in select regions immediately after World War II. Specifically, a 1% increase in the proportion of ethnic Germans in 1970 was associated

Table 1.12.: Targeted ethnicities in the highest education-employment category, host regions

Dependent Variable is the Log of:	Dependent variable in the Soviet censuses			
	1959	1970	1979	1989
Panel A: White-collar employment				
All exiled ethnicities	0.007	0.006	−0.015	−0.037
Excl. Germans	0.024**	0.055**	0.047**	0.041
With ancestral lands	0.009	0.003	−0.011	−0.031
Advanced in 1926	−0.012	−0.018	−0.037**	−0.048***
Germans	−0.005	−0.020	−0.061***	−0.076***
Protestants	0.011	−0.003	−0.007	−0.021
Overall shock in deportees 1939-59	0.009	0.014	0.016**	0.013*
Panel B: Tertiary education				
All exiled ethnicities	0.024	−0.015	−0.024	0.036
Excl. Germans	0.030	0.007	−0.008	0.219**
With ancestral lands	0.018	−0.019	−0.019	0.034
Advanced in 1926	−0.006	−0.033	−0.024	−0.019
Germans	−0.011	−0.040***	−0.038*	−0.076
Protestants	0.012	−0.021	−0.018	0.020
Overall shock in deportees 1939-59	0.031**	0.005	0.013*	0.046*
Geographic and violence controls	✓	✓	✓	✓

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. The explanatory variables comprise the complete set of targeted ethnicities, including those with ancestral lands outside the core Soviet Union (Germans, Meskhetian Turks, and Koreans), culturally advanced ethnicities in 1926 (Germans and Crimean Tatars), the share of Germans, and the share of Protestants among targeted ethnicities (specifically Germans and Koreans). All specifications contain a constant term, the German Occupation Dummy, Change in Percent of Jewish Pop. '39 to '59, Log Perc. of the Russian population in 1989, as well as controls for log urban population 1939, log total population in the indicated year, the longitude and latitude of the oblast capital, controls for growth in both the defense industry (Growth Defense Industry '39 to '59 less relocated defense facilities) and penal labor camps (Gulags). It further includes to the log of the total population loss '39-'59.

with a 0.14% increase in collective farm employment, which can be attributed to the Soviet authorities' decision to station Germans in regions with high collective farm employment to leverage their agricultural knowledge. Notably, the coefficients are even larger when compared with deported ethnic groups with ancestral lands outside the Soviet Union (i.e., Germans, Koreans, and Meskhetian Turks at 0.173%) and those considered culturally advanced in the early Soviet Union (i.e., Germans and Crimean Tatars at 0.174%). Prior research underscores the significance of migrant communities in disseminating knowledge and skills across regions, potentially fueling the growth of specific productive sectors in Soviet Central Asia and Siberia. Further investigation is necessary to ascertain the precise contributions of ethnic Germans and other factors like government policies and investments to the development of the agricultural sector. Furthermore, ethnic Germans are linked to a 0.06% increase in primary educated local non-Slavs in the late Soviet Union.

Upon analyzing data from multiple censuses conducted after the deportation of rehabilitated and permanently displaced groups, I cannot observe any significant influence on white-collar employment or higher education rates that could be attributed to these ethnic groups and that would have had a positive effect on the non-Slavic population residing in the host regions. However, I did identify negative effects on both sectors for Germans and Crimean Tatars. This outcome is consistent across most of the censuses. Nevertheless, the existence of rehabilitated ethnic groups in host regions led to increased higher education levels among the non-Slavic population, particularly in the 1970s and 1980s. This outcome confirms the capital flight hypothesis and is statistically significant at the 1% and 5% levels.

The lack of distributional effects despite upstream complementarities is puzzling, as "special settlers" not only work but also consume goods and services, naturally increasing demand for (white-collar) labor (Peri 2014). These findings are robust across various censuses and are not influenced by political or institutional changes resulting from the Soviet leadership shift or the rapidly changing macroeconomic environment in the late Soviet Union. Nor can they be attributed to the institutional inertia of the Soviet command system, since positive effects could have been

Table 1.13.: Results: Kolkhozniki locals ex. Slavs, host regions

	Dependent variable in the Soviet censuses			
	1959	1970	1979	1989
Log rehabilitated	0.110**	0.070	−0.018	−0.052
	(0.050)	(0.122)	(0.124)	(0.142)
Log exiled	0.069	0.187**	0.066	0.063
	(0.061)	(0.092)	(0.127)	(0.147)
Log Russians	−0.702***	−0.448**	−0.168	−0.178
	(0.172)	(0.187)	(0.199)	(0.206)
Log collective farm workers '39	0.078	0.268***	0.203*	0.241**
	(0.069)	(0.103)	(0.108)	(0.112)
Spatial lag: Dependent Variable	−0.100	−0.265***	−0.159	−0.073
	(0.066)	(0.089)	(0.100)	(0.110)
Controls	✓	✓	✓	✓
Observations	55	55	55	55
Pseudo R^2	0.89	0.82	0.84	0.82
Chi-squared	452.485	257.682	288.210	246.906
Wald Test	0.301	0.011	0.235	0.766

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

All specifications contain a constant term, the German Occupation Dummy, Change in Percent of Jewish Pop. '39 to '59, Log Perc. of the Russian population in 1989, as well as controls for log urban population 1939, log total population in the indicated year, the longitude and latitude of the oblast capital, controls for growth in both the defense industry (Growth Defense Industry '39 to '59 less relocated defense facilities) and penal labor camps (Gulags). It further includes to the log of the total population loss '39-'59.

Table 1.14.: Results: Primary educated locals ex. Slavs, host regions

	Dependent variable in the Soviet censuses			
	1959	1970	1979	1989
Log rehabilitated	−0.013**	0.011	0.016	−0.100
	(0.007)	(0.025)	(0.020)	(0.107)
Log exiled	−0.011	−0.010	−0.004	0.086
	(0.008)	(0.017)	(0.018)	(0.091)
Log Russians	0.256***	0.223***	0.079***	0.298**
	(0.022)	(0.033)	(0.029)	(0.132)
Log primary educated '39	−0.016	0.217***	0.173***	0.266
	(0.034)	(0.049)	(0.043)	(0.194)
Spatial lag: Dependent Variable	0.008	−0.006	0.002	0.076
	(0.009)	(0.017)	(0.015)	(0.074)
Controls	✓	✓	✓	✓
Observations	55	55	55	55
Pseudo R^2	1.00	0.99	0.99	0.83
Chi-squared	$2.2e + 04$	5051.847	6276.052	268.706
Wald Test	0.027	0.338	0.072	0.449

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

All specifications contain a constant term, the German Occupation Dummy, Change in Percent of Jewish Pop. '39 to '59, Log Perc. of the Russian population in 1989, as well as controls for log urban population 1939, log total population in the indicated year, the longitude and latitude of the oblast capital, controls for growth in both the defense industry (Growth Defense Industry '39 to '59 less relocated defense facilities) and penal labor camps (Gulags). It further includes to the log of the total population loss '39-'59.

expected as early as the 1970s. However, one explanation for the absence of employment effects could be the way vacancies are allocated in host regions, the outflow of highly skilled locals in response to changes in the social fabric, or underlying behavioral barriers, such as a poverty mentality that leads to trade-offs against more pressing needs or other unobserved constraints. These unobserved constraints may include differences in perceptions of whether

Table 1.15.: Targeted ethnicities in the lowest education-employment category, host regions

Dependent Variable is the Log of:	Dependent variable in the Soviet censuses			
	1959	1970	1979	1989
Panel A: Collective farm employment				
All exiled ethnicities	0.069	0.187**	0.066	0.063
Excl. Germans	−0.054	0.061	0.041	0.096
With ancestral lands	0.037	0.173**	0.034	0.001
Advanced in 1926	0.121**	0.174**	0.063	0.058
Germans	0.118**	0.144***	0.115	0.116
Protestants	0.027	0.119**	−0.008	−0.027
Overall shock in deportees 1939-59	0.014	0.003	−0.004	0.001
Panel B: Primary education				
All exiled ethnicities	−0.011	−0.010	−0.004	0.086
Excl. Germans	0.000	−0.004	0.017	0.076
With ancestral lands	−0.010	−0.000	−0.001	0.108
Advanced in 1926	−0.016***	−0.007	−0.001	0.062
Germans	−0.011*	−0.007	0.002	0.063
Protestants	−0.007	−0.001	−0.005	0.089
Overall shock in deportees 1939-59	0.005	0.006	0.007	0.040
Geographic and violence controls	✓	✓	✓	✓

$^{*}\ p < 0.05,\ ^{**}\ p < 0.01,\ ^{***}\ p < 0.001$. The explanatory variables comprise the complete set of targeted ethnicities, including those with ancestral lands outside the core Soviet Union (Germans, Meskhetian Turks, and Koreans), culturally advanced ethnicities in 1926 (Germans and Crimean Tatars), the share of Germans, and the share of Protestants among targeted ethnicities (specifically Germans and Koreans). All specifications contain a constant term, the German Occupation Dummy, Change in Percent of Jewish Pop. '39 to '59, Log Perc. of the Russian population in 1989, as well as controls for log urban population 1939, log total population in the indicated year, the longitude and latitude of the oblast capital, controls for growth in both the defense industry (Growth Defense Industry '39 to '59 less relocated defense facilities) and penal labor camps (Gulags). It further includes to the log of the total population loss '39-'59.

intelligence can be developed or is fixed (growth mindset vs. fixed mindset), which may have influenced the take-up of additional educational opportunities (Dweck 2015). Classism and possible perceptions of upward mobility as "elitist" could also be a factor, apart from bounded rationalities such as personal inertia, individual switching costs (Heiss et al. 2021), limited attention span (Abaluck and Adams-Prassl 2021), or other unobserved constraints (Gaynor et al. 2016). For rehabilitated ethnicities, a lack of attachment to host regions and the prospect of returning soon may have prevented the translation of higher education into white-collar employment. In this case, one can also speak of a kind of educational capital flight of the rehabilitated population.

Social Conflict

So far, I have shown that the proportion of ethnic groups with ancestral lands who avoided deportation from their origin region had a significant impact on the pro-Soviet vote in the 1991 referendum, as well as on protests and riots. In the following section, I will now shift my focus to the effect of the rehabilitation decree on ethnic groups who were in internal exile in host regions. This will involve examining the waves of return migration by rehabilitated groups such as the Karachays, Balkars, Kabardins, Chechens, Ingush, and Kalmyks, which began in the late 1950s. Although a constitutional right, this return migration from their origin region in the Caucasus to host regions in Central Asia, and later back again, incurred significant costs. To better understand the impact of return migration on the pro-Soviet vote in the 1991 referendum and participation in protests and marches in the host regions of Central Asia and Siberia, I control for the three-tiered local labor force and several episodes of violence in all host region specifications. To simplify interpretation, I used log-transformed dependent and explanatory variables and reduced the number of controls. The results for the 1991 referendum and participation in protests and marches are presented in Tables **??** and **??**. In both cases, columns 1 through 4 represent the instrumented least squares SDEM-IV model,

while column 5 compares the instrumented model to its non-instrumented counterpart. Corresponding spillover effects are shown in A.3.19 and A.3.21.

Table **??** highlights the relationship between the presence of certain ethnic groups and their voting behavior in the 1991 referendum on the preservation of the Soviet Union. Notably, column 3 demonstrates that the local presence of Korean, Crimean Tatar, Meskhetian, and German populations significantly predicted their support for the Soviet Union, before accounting for employment levels. I find that a 1% increase in the size of these ethnic groups corresponded to only a small 0.5% increase in the support for the Soviet Union, without any corresponding effect in the origin regions for those who avoided deportation. However, this relationship loses significance once I take into account local employment levels in the host region. Nevertheless, the working class had a significant impact on voting decisions, even when I consider the labor market outcomes of those living in permanent exile. Specifically, a 1% increase in the blue-collar settler populations resulted in a 0.5% increase in the affirmation of Soviet supremacy in the 1991 referencum, which is comparable to the coefficients observed in the origin regions.

	Spatial Durbin Error Model (SDEM-IV)				SDEM
	(1)	(2)	(3)	(4)	(5)
Log exiled '89'	−0.069	−0.043	−0.437**	−0.103	−0.105
	(0.054)	(0.049)	(0.215)	(0.257)	(0.277)
Log rehabilitated '89'	−0.028	−0.129**	−0.108*	−0.068	−0.070
	(0.067)	(0.061)	(0.060)	(0.062)	(0.062)
Log Russians '89		0.273***	0.211**	0.160**	0.163*
		(0.078)	(0.085)	(0.081)	(0.084)
Polarization index '89		−0.705***	−0.691***	−0.513**	−0.524*
		(0.250)	(0.244)	(0.241)	(0.279)
Log between-group IA, exiled '89'			0.422*	0.121	0.122
			(0.223)	(0.260)	(0.280)
Log white-collar settler '89				0.154	0.154
				(0.310)	(0.311)
Log blue-collar settler '89				−0.520*	−0.517*
				(0.299)	(0.305)
Log kolkhozniki settler '89				−0.048	−0.048
				(0.051)	(0.052)
Spatial lag: Dependent Variable	0.230***	0.138**	0.166***	0.162***	0.158***
	(0.070)	(0.062)	(0.063)	(0.059)	(0.058)
Geogr. and violence controls	✓	✓	✓	✓	✓
Observations	55	55	55	55	55
Pseudo R^2	0.78	0.84	0.85	0.87	0.87
Chi-squared	283.585	282.820	274.618	362.776	344.730

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. All specifications contain a constant term, the German Occupation Dummy, Change in Percent of Jewish Pop. '39 to '59, Log Perc. of the Russian population in 1989, as well as controls for log urban population 1939, log total population in the indicated year, the longitude and latitude of the oblast capital, controls for growth in both the defense industry (Growth Defense Industry '39 to '59 less relocated defense facilities) and penal labor camps (Gulags). It further includes to the log of the total population loss '39-'59. Dependent variable is the inverted (!) log percentage of votes in favor of preserving the Soviet Union in 1991, that is the secessionist voting behavior.

Table **??** provides interesting insights on the protest and riot behavior. Although there are no overall effects, I find that ethnic groups living permanently in exile exhibit significantly less protest and riot behavior, as seen in Panel B of Table **??**. Specifically, a 1% increase in the regional presence of Koreans, Germans, and Meskhetian Turks whose ancestral territories are outside Ukraine, Belarus, and Russia is associated with a substantial and statistical significant 2.3% decrease in protest activity. Moreover, the proportion of Protestants among the deportees shows a notable impact, as a 1% increase in their regional presence leads to decrease in protests and riots of the same magnitude. Interestingly, these ethnicity-based effects are not offset by greater contact with other ethnic groups, unlike in the origin regions. My findings highlight the importance of religious identity in promoting peaceful forms of activism among permanently exiled ethnic groups, who share a cultural and historical identity and have experienced indiscriminate violence through deportations. Additionally, it's important to note that permanent exiles are among

the minority groups with the most to lose from the collapse of the Soviet Union. However, this type of behavior is not evident in the voting decisions of secessionists, as demonstrated in Panel A of Table **??**.

	Spatial Durbin Error Model (SDEM-IV)				SDEM
	(1)	(2)	(3)	(4)	(5)
Log exiled '89'	0.124	0.122	0.056	−0.872	−0.835
	(0.166)	(0.160)	(0.709)	(0.841)	(0.821)
Log rehabilitated '89'	−0.069	−0.062	−0.060	−0.233	−0.252
	(0.194)	(0.190)	(0.191)	(0.195)	(0.200)
Log Russians '89		0.257	0.249	0.441*	0.394
		(0.260)	(0.279)	(0.263)	(0.280)
Polarization index '89		−0.180	−0.182	−0.624	−0.517
		(0.809)	(0.810)	(0.786)	(0.811)
Log between-group IA, exiled '89'			0.070	0.826	0.791
			(0.731)	(0.846)	(0.829)
Log white-collar settler '89				−0.539	0.078
				(1.084)	(1.347)
Log blue-collar settler '89				1.976*	1.466
				(1.023)	(1.227)
Log kolkhozniki settler '89				−0.154	−0.215
				(0.182)	(0.181)
Spatial lag: Dependent Variable	−0.498**	−0.543**	−0.547**	−0.518*	−0.311
	(0.245)	(0.246)	(0.251)	(0.273)	(0.232)
Geogr. and violence controls	✓	✓	✓	✓	✓
Observations	55	55	55	55	55
Pseudo R^2	0.59	0.59	0.59	0.64	0.65
Chi-squared	78.365	81.211	81.282	101.977	97.339

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. All specifications contain a constant term, the German Occupation Dummy, Change in Percent of Jewish Pop. '39 to '59, Log Perc. of the Russian population in 1989, as well as controls for log urban population 1939, log total population in the indicated year, the longitude and latitude of the oblast capital, controls for growth in both the defense industry (Growth Defense Industry '39 to '59 less relocated defense facilities) and penal labor camps (Gulags). It further includes to the log of the total population loss '39-'59. Dependent variable is the log number of protests and riots between 1987 and 1992 based on Beissinger (2002).

Overall, I observe that ethnic groups living in permanent exile, especially the younger generation, did not vote either for the preservation or abolition of the Soviet Union. However, they were significantly less likely to participate in protests and riots. However, the lack of effects in the voting specification may be related to the preservation of the Soviet Union as a continuation of a republic-wide transfer system. Even though the impact of deportation and with it the understratification by permanently exiled ethnicities on higher education and white-collar employment had leveled off in the 1980s, the persisting ethnically based protest behavior in host regions indicates that the "special settler regime" had lasting effects on suppressing political activity. These effects were observed in individuals born after 1937 and who would have been about 50 years old or younger in the late Soviet Union. It is essential to note that major macroeconomic changes of the late 1980s, such as the fall of the Iron Curtain, economic transition and the beginning recession may have influenced electoral outcomes. Interestingly, the protest behavior of permanent exiles, particularly ethnic Germans, may have been the precursor to the massive emigration of this group from Central Asia to Germany, making the protest and riot outcomes resemble a kind of Stockholm syndrome. These findings are significant because they challenge the previous studies on the negative long-term effects of Soviet violence and ethnicity and call for further research on the relationship between ethnicity, violence, trauma experiences, and their effects on economic and political variables. Previous studies (Lupu and Peisakhin 2017; Suesse 2018) have highlighted the negative long-term effects of Soviet violence and ethnicity, and my findings provide a nuanced understanding of this relationship.

	Spatial Durbin Error Model (SDEM-IV)			
	(1)	(2)	(3)	(4)
Panel A: Secessionist Voting in 1991				
Log exiled '89'	-0.069	-0.043	-0.437^{**}	-0.103
Excl. Germans	-0.144^{***}	-0.095^{*}	-0.112^{*}	-0.046
With ancestral lands	-0.027	-0.027	-0.090	-0.362
Advanced in 1926'	-0.066^{*}	-0.036	-0.101	-0.018
Germans	-0.018	-0.028	-0.065	0.010
Protestants	-0.018	-0.015	0.050	-0.130
Overall shock in deportees 1939-59	-0.021	-0.029^{**}	-0.036^{**}	-0.028
Panel B: Protesting and Rioting 1987-92				
Log exiled '89'	0.124	0.122	0.056	-0.872
Excl. Germans	0.225	0.264	0.273	0.138
With ancestral lands	0.071	0.036	-2.657^{***}	-2.265^{***}
Advanced in 1926'	0.012	0.016	-0.327	-0.529^{**}
Germans	0.116	0.036	-0.302	-0.386
Protestants	0.009	-0.006	-1.289^{***}	-1.091^{**}
Overall shock in deportees 1939-59	0.010	-0.004	-0.039	-0.088
Employment controls	$-$	$-$	$-$	✓
Log Russians	$-$	✓	✓	✓
Polarization Index	$-$	✓	✓	✓
Geographic and violence controls	✓	✓	✓	✓

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. The explanatory variables comprise the complete set of targeted ethnicities, including those with ancestral lands outside the core Soviet Union (Germans, Meskhetian Turks, and Koreans), culturally advanced ethnicities in 1926 (Germans and Crimean Tatars), the share of Germans, and the share of Protestants among targeted ethnicities (specifically Germans and Koreans). All specifications contain a constant term, the German Occupation Dummy, Change in Percent of Jewish Pop. '39 to '59, Log Perc. of the Russian population in 1989, as well as controls for log urban population 1939, log total population in the indicated year, the longitude and latitude of the oblast capital, controls for growth in both the defense industry (Growth Defense Industry '39 to '59 less relocated defense facilities) and penal labor camps (Gulags). It further includes to the log of the total population loss '39-'59.

1.7. Conclusion

I examined the impact of a significant migration shock, the ethnic deportations under Stalin, on educational and skill differentials and on two dimensions of social conflict in the regions of origin and host regions. In order to ensure the validity of my empirical investigation, I devoted ample attention to deriving theory-based specifications and identifying underlying assumptions that would strengthen the plausibility of my analysis. To accurately attribute post-shock changes to settler inflows rather than secular trends, I take into account the correlation between the generated settler variables and the dependent variables. Also, I discuss the potential limitations of a "one-size-fits-all" approach in terms of the importance of local labor market institutions, competition, and government policies in explaining the results (Borjas and Monras 2017, p. 409). For robust inference, I aggregate the data used at the region/occupation/education or region/choice/protest level, which is especially appropriate given the balanced and large sample of origin and host regions. In addition, my study covers a long observation period from 1926 to 1989, which provides insights into institutional inertia due to, for example, five-year plans. My results highlight both the relative distributional effects of forced deportation among non-Slavic educational and employment groups and the absolute effects of Stalin's ethnic terror on the political behavior of subsequent generations of settlers. Through examination of different time horizons, my results relate to both transitional and long-term equilibrium outcomes, including the effects on the generation of children, grandchildren, and great-grandchildren of those who were either deported or may have benefited from deportation. Overall, my study shows numerically significant positive effects for locals, which is consistent with previous studies by Dustmann et al. (2016).

My analysis shows that in the origin regions, the return of the rehabilitated ethnic groups from the host regions led to a rapid increase in employment and skill levels, accompanied by a shift away from agriculture. Host regions, on the

other hand, experienced an increase in the highest education category, also attributable to the rehabilitated ethnic groups, with a lagged corresponding increase in white-collar employment. These results are consistent with the capital flight hypothesis of Botticini and Eckstein (2005) and Becker, Grosfeld, et al. (2020), according to which rehabilitated ethnic groups invested in more mobile capital, leading to an improvement in their economic prospects. However, the lack of qualitative expansion of local non-Slavic employment profiles in host regions due to understratification by permanently displaced persons highlights the limitations of discriminatory and rigid economic policies that seemed to prevent host societies from realizing their full potential. The presence of special settlers and rehabilitated ethnic groups in both regions can be further associated with both a tendency toward pro-communist voting behavior and higher levels of protest activity. These contrasting findings demonstrate the complexity of nationality politics aimed at improving the status of "titular nations" and how it can both defuse and exacerbate interethnic conflict. Unfortunately, due to data limitations, I am unable to examine the specific socioeconomic consequences of the specific settler regime for the ethnic groups directly affected. Nevertheless, the results suggest that the practical inadequacy of using deportees as forced laborers was exacerbated by the size of the Soviet Union. Overall, the untapped potential of immigration to promote business growth and bring in new skills and ideas highlights the missed opportunities caused by inflexible and discriminatory economic policies (Sarvimäki 2011).

Because my argument is based on longue durée reasoning, I am not able to explicitly test the quality and success of cultural assimilation, and thus there are several avenues for future research. One of these limitations is the need to examine the labor market performance of former "special settlers" or their descendants who now identify as Russians in the late Soviet Union, as compared to permanently displaced individuals who continue to identify with their origin region. Furthermore, my study does not examine when and to what extent rehabilitated and permanently displaced "special settlers" identify more closely with the culture, values, and beliefs of the host region or their origin region. This is an area that future research could focus on, particularly with regard to factors that influence cultural assimilation patterns, such as the role of interethnic marriages as highlighted in Facchini et al. (2015, p. 620) and Steinhardt (2018). Moreover, I did not differentiate my "special settler" variable along gender dimensions and measured only macroeconomic effects. Future research could address this limitation by examining gender effects and possibly addressing the problem of non-monotonic past trends in host regions due to nation policy in the late 1920s, as suggested by Borjas and Monras (2017, p. 410). However, given the autocratic nature of the Soviet Union, it is a challenging task to accurately separate the effects of coercive state actions on daily life from the effects of ethnic cleansing campaigns. Future research could examine the precise mechanisms involved in the processes of relocation and rehabilitation and shed light on the long-term consequences of these policies for individuals and communities.

2 | Red Rage*

Secret Policing & Political Divide in the Russian Empire

Abstract

In this paper, we examine the impact of tsarist repression on political preferences during the Russian Revolution of 1917, using previously unexplored data from the operations of the Okhrana, imperial Russia's secret police, between the late 1880s and the early 1900s. Constructing a measure of local repression intensity, we estimate the impact of surveillance on electoral outcomes during the 1917 Constituent Assembly. We measure political support for the radical left in terms of votes cast for the Bolshevik Party and for the radical right in terms of votes cast for the Liberals and the Kadets. We find that stronger repression at the local level decreased electoral polarization. At the same time, there is a positive and robust impact of the Okhrana on general and relative radicalization of district-level political preferences. We find that Okhrana surveillance produced higher electoral support for the radical right than for the moderate and radical left. Hence, the Russian secret police was effective in generating strong right-wing constituencies in favor of the regime, while fueling the reaction of the Russian left and setting the stage for the Civil War.

JEL Classification: N33, N43, P20, P26, P37, P48, P51

2.1. Introduction

Authoritarian states have long grappled with a fundamental challenge: the absence of a public sphere that facilitates citizens' access to free expression, independent media, or multiparty elections. This makes it difficult for such states to gauge their citizens' views and attitudes (Kuran 1995). To tackle this, authoritarian regimes frequently rely on elaborate surveillance systems that invade citizens' privacy, engendering a pervasive climate of distrust and suspicion. This, in turn, transforms civil society, affecting both individual and collective behavior (Davenport 2005; Arendt 1973). By eschewing heavy-handed repression in favor of widespread surveillance, state security agencies can gather more precise information about citizens (Dimitrov and Sassoon 2014). Furthermore, governments with a comprehensive understanding of the opposition's structure can effectively curb repeated mobilizations by focusing on clandestine activities (Sullivan 2016). To illustrate, Truex (2018) reveals that the Chinese government takes proactive measures to suppress potential flashpoints for protests before they can even take shape. Although physical surveillance is frequently utilized in authoritarian states, there is a dearth of systematic research on this type of repression. In our study, we define physical surveillance as "targeted, systematic, and routine attention to personal details for the purpose of influencing, managing, protecting, or directing" (Lyon 2007, p. 13). This lack of research is particularly perplexing when one considers that tens of thousands of informal agents were employed in former Eastern Bloc regimes to systematically monitor citizens(Jacob and Tyrell 2010; Hager and Krakowski 2021).

In this study, we investigate how the Okhrana, the world's first professional intelligence service, influenced political leanings leading up to the Russian Revolution of 1917. The Okhrana was founded in 1880 following the assassination of Tsar Alexander II and played a pivotal role in sustaining tsarism by countering leftist terrorism until its dissolution in March 1917. Unlike law enforcement systems in other European nations, the Okhrana possessed the authority to apprehend and detain individuals without judicial oversight, highlighting the criticality of surveillance and repression in autocratic regimes (Pipes 1979, p. 302; Daly 2002, p. 78).[1] Much like the Stasi in East Germany, the Okhrana was

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[1] Peter Struve, a former Marxist turned liberal, postulated in 1903 that "the omnipotence of the political police" allowed tsarism to survive (Andrew and Gordievsky 1990, p. 21).

often seen as "the living symbol of all that is most repressive, cruel, mean, and vile about autocracy" (Nicolaievsky 1934, p. 129, quoting Evno Azev).

We analyze the Okhrana's structure and operations in the European part of Russia from the 1880s to 1900s by utilizing previously unexplored data gathered by Grigoriadis (2023) from the organization's Paris division, which is accessible from the Hoover Institution at Stanford University. The dataset contains information on more than 1,700 individuals, including key figures of the Bolshevik Revolution like Molotov, Stalin, and Trotsky. We use this information to construct local indicators of repression and radicalization tendencies and assess their influence on voting results in the 1917 Constituent Assembly, using electoral information from over 400 administrative districts obtained from Protasov et al. (2014). Focusing on the Constituent Assembly enables us to evaluate the effect of tsarist repression on political inclinations without the impact of tsarism on voting outcomes. To test the hypothesis that local repression and radicalization fueled polarization and increased turnout for radical parties in revolutionary Russia, we include replication data from Grosfeld, Sakalli, et al. (2020) to track the integration experiences of rural Jewish individuals. We also control for alternative explanations of Russian political development, such as the idea that peasant protests were motivated by a desire for "land and freedom," using data on land quality and the historical prevalence of serfdom from Buggle and Nafziger (2021). We also control for the support of industrial workers, which Lenin said would lead to the triumph of the Bolshevik Revolution.

We focus on the Party of Constitutional Democrats (Kadets), a classical liberal party on the other end of the political spectrum in Russia, and examine whether the repressive tactics of the Okhrana influenced the Kadets' electoral outcome after the failed Kornilov coup of September 1917, which weakened the political power of the extreme right. Given the Okhrana's involvement in implementing the tsarist government's anti-Semitic policies in the settlement area, we also examine the possible role of ethnic grievances in supporting the far left. Our analysis draws on historical accounts that highlight the overrepresentation of Jews in the Russian revolutionary movement and in anarchist terrorist groups. The largest Jewish political organization, the BUND (All-Jewish Workers' League in Lithuania, Poland, and Russia), was a Social Democratic/Marxist movement that later became an independent branch of the Russian Social Democratic Workers' Party. The BUND advocated moderate and nonseparatist goals, including cultural autonomy within Russia and opposition to Zionism (Budnitskii 2008).

We extend the research conducted by Castañeda Dower, Markevich, et al. (2021) on the factors that contributed to the success of the Bolsheviks in the 1917 Constituent Assembly elections. The authors find a positive correlation between the proportion of industrial workers in a region and the success of the Bolsheviks, which they link to the presence of coal-bearing strata. Kofanov (2020), however, raises the issue that the relationship between industrialization and peasant protests is not necessarily clear-cut, as it can lead to both material benefits for peasants and increased competition for local resources. To gain further insight, Finkel et al. (2017) examine peasant protest activity and uses provincial-level datasets to establish a link between peasant unrest, the abdication of the tsar, and the October Revolution. Their results suggest that rural discontent was positively correlated with land quality and higher historical density of serfdom. By also considering these alternative explanations for Russian political development, we contribute to a more nuanced understanding of the factors that influenced the outcome of the 1917 elections. Our research leads to the following findings:

1. The more radicalized a community becomes at a local level, the more polarized the electoral preferences become.

2. The severity of local radicalization, as measured through Okhrana's surveillance activities, has a significant impact on the popularity of both left- and right-wing parties, especially among moderate and far-right factions.

3. Our analysis reveals a notable increase in radicalization among both left and right-wing parties, in absolute and relative terms.

We contribute to several areas of research. First, in the area of political economy, we add to the existing literature on political preferences in industrialized economies. According to Galor (2011), democratic institutions in these societies are unstable because political movements would benefit less from a democratic path. Moreover, Ziblatt (2008) supports the idea of a unitary growth theory by showing that land inequality in Prussia slowed down democratization efforts. Moreover, Samuels and Thomson (2021) suggest that the preferences of agricultural elites for democratization depended on their demand for labor. Our study is significant in that wealthy capitalists and landowners would be more likely to oppose the radical left with its plans for land redistribution. We also contribute to the growing body

of research on the rise of political extremism in the first half of the 20th century. While the existing literature has focused mainly on right-wing political parties (Voigtländer and Voth 2021; Doerr et al. 2021), recent studies have emphasized the importance of left-wing extremism (Aidt and Jensen 2014; Castañeda Dower, Markevich, et al. 2021). What distinguishes our research from others is that we show how establishment, radical, and leftist alternatives were able to be voted for by both men and women in the 1917 constituency assembly elections. We show that a political party's ability to maintain public order is critical to the stability of a political system when it faces significant redistributive pressures (Keefer 2009). Our study highlights the historical and social factors that have contributed to the rise of the radical left relative to the far right and provides valuable insights into the similarities and differences between these two movements. We agree with the concept that harsh suppression of dissent can contribute to the formation of distinct national identities (Gellner 2006; Beissinger and Kotkin 2014). Finally, our study contributes to the literature on the 1917 Revolution in Russia by examining the transition from the Russian Empire to the Soviet Union from the perspective of political polarization and the role of social grievances in these processes. We provide new insights into how local radicalization and repression influenced popular mobilization for socialist causes. The study also demonstrates the importance of considering the complex interplay between economic and cultural factors to understand political polarization and the rise of extremist movements during this period.

The structure of this paper is as follows: Section 2.2 discusses the historical background that led to the founding of the Okhrana, the rise of anti-Semitism, and the functioning of the 1917 Constituent Assembly during the Russian Revolution. Section 2.3 presents the data sources we used, while section 2.4 explains our approach to estimating the main results, which are presented in Section 2.5. Finally, in Section 2.6 we summarize our main findings and suggest directions for future research.

2.2. Historical background

2.2.1. The Okhrana

The tsarist political police were commonly referred to by contemporaries and historians as the "okhrana" or "okhranka," but these terms do not refer to a single organization. Rather, they describe a network of offices and organizations within the police bureaucracy.[2] A more precise distinction can be made between the "special section," which was also called the "Fontanka" because of its location on the Fontanka Canal in St. Petersburg. The special section was a division of the police and was subordinate to the Minister of Interior. It was at the top of the organizational hierarchy of the political police and was attached to the police headquarters in St. Petersburg. The main task of the Okhrana was to investigate political crimes. It focused primarily on revolutionary groups that protested with terror and violence. The Okhrana staff collected and analyzed information, which they then compiled into circulars. These circulars were weekly news reports received by the tsar, who issued orders to combat subversive activities. However, the Okhrana was only one of nine secretariats within the police department that produced these opinions, circulars, and orders.

The Okhrana's activities were characterized by a high degree of secrecy, which was taken to the extreme in 1911 when a photograph of Okhrana employees fell into the hands of the revolutionary underground. After this incident, group photographs were banned (Daly 2004, p. 112). Despite the Special Branch's official status as a secret organization, its location within the Fontanka headquarters was common knowledge and had several entrances and exits through which officers could enter and leave unnoticed. To maintain anonymity, most Okhrana chiefs did not wear police uniforms, lived under false names, and changed their places of residence frequently. Arrests of subversive elements usually took place at night, and Okhrana officials were not present during the arrests. To prevent the destruction of compromising material, several arrests were made at the same time, which the Okhrana referred to as "liquidation." This resulted in entire groups of acquaintances disappearing overnight. The most secretive aspect of the Okhrana was the establishment of "black cabinets," or hidden offices in large postal depots. These gave Okhrana officials access to all postal and telegraph correspondence in the Russian Empire. Although tsarist interior ministers routinely denied intercepting and copying all correspondence, known as "perlustration," Lenin was well aware of the effectiveness of mail interception (Lauchlan 2005, p. 50). The Okhrana revealed his brother's involvement in the

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[2] These terms derive from the Russian verb "okhranyat'," which means to protect or guard.

attempted assassination of Tsar Alexander III, for which he was hanged in 1887 (Burtsev 1927, p. 261). Because of the secrecy of the Okhrana, revolutionaries were left to speculate about the size and character of the organization.

As a result of this situation, the impression was created that Alexander III had created an omnipotent, omniscient, and omnipresent security organization (Zhilinskii 1917). In St. Petersburg, the average revolutionary could not hide from the political police for more than three months, and those who worked underground had to assume that their ranks were infiltrated by traitors (Zuckerman 1996, p. 38, footnotes 45, 46, 47). The influence of such a proto-police state on the thinking and radicalization of Bolsheviks like Dzerzhinsky, Lenin, and especially Stalin was considerable. At the time of the Revolution, the typical Bolshevik activist had spent four years of his life in tsarist prisons or exile, while the average Menshevik had spent five (Figes 1996, pp. 124-5). Russian historian Richard Pipes elaborates on this point, noting that:

> *All of them had been shadowed, searched, arrested, kept in jail, and sentenced to exile by the political police of the imperial government. They had battled with the censorship. They had had to contend with agent provocateurs planted in their midst. They knew the system intimately, from the inside, which meant that they also knew its shortcomings and loopholes. Their vision of a proper government was a mirror image of the imperial regime's to the extent that what the latter called 'subversion' they labeled "counter-revolution" (Pipes 1979, p. 317).*

The Okhrana's extensive network of external and internal agents enabled it to gather a vast amount of information on the Bolsheviks, making its archives one of the most comprehensive sources of information on the history of Lenin's party before 1917 (Leggett 1981, p. XXIV). Amazingly, four out of five members of the St. Petersburg Committee of the Bolsheviks were in fact agents of the Okhrana (Leggett 1981, p. XXIV; Andrew and Gordievsky 1990, p. 33). Okhrana agents went so far as to infiltrate the highest levels of the Bolshevik leadership, including Lenin's close friend Roman Malinovsky. This led to the arrest of Stalin, Sverdlov, and Ordzhonikidze in February 1913, demonstrating the impressive reach of the Okhrana. The clearing of the revolutionaries' ranks forced them to refine their methods of concealment, which made their suppression even more challenging. Many later Bolshevik government officials, such as Lenin (Vladimir Ilyich Ulyanov) and Stalin (Joseph Vissarionovich Dzhugashvili), continued to use aliases after the revolution (Andrew and Mitrokhin 1999, p. 36). To counter the shift of Russian revolutionary activity from the Russian Empire to Central Europe, Okhrana opened his Paris office in 1883. Already during the 1905 Revolution, Okhrana had uncovered the revolutionary plans of the Bolsheviks, forcing Lenin into exile in 1907 for the next decade. Through show trials and mass executions, the Okhrana reduced the number of members of revolutionary groups from 100,000 to 10,000 by 1910 (Fischer 1997).

Relentless suppression of dissent at home and abroad not only decimated political opposition but also undermined the moral credibility of the empire by proceeding with indiscriminate brutality that alienated common society from the government (Lauchlan 2005, p. 22). The Okhrana's persecution of subversive groups intruded into everyday life and created the false impression that the agency was omniscient, a perception reinforced by the profiles of leading officers such as Lopukhin and Zubatov. Former revolutionary Vladimir Burtsev also exposed police misconduct and revealed the identities of informants, including Evno Azef (Ruud and Stepanov 1999). Subatov, for example, was recruited by the Moscow Okhrana in 1886, exposed as a spy in 1887, and then rehired as an officer in the same department, later becoming deputy chief in 1893 and chief (Ruud and Stepanov 1999) in 1895. By 1905, the political struggle had gripped all sections of society. Despite its successes, the Okhrana paid a heavy price in its struggle against political opposition. Three of the six interior ministers who held office between 1902 and 1911 were assassinated by terrorists, and another minister, Durnovo, was the subject of two assassination attempts in 1905 and 1906.[3] According to a 1909 police report, between May 13, 1903, and March 2, 1909, a total of 190 high-ranking government officials were victims of political assassinations, including 58 high-ranking police officers (29 dead, 18 wounded, and 11 others). In fact, between February 1905 and May 1906, more than 700 police officers of various ranks were killed in terrorist attacks (Lauchlan 2005, p. 56).

2.2.2. Radicalization of the society

The new Tsar Alexander III, as well as his top police officials and inner circle, held anti-Semitic views that were reflected in the passage of laws affecting civil and property rights, taxation, and education. These policies led to de

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[3] The victims were Sipiagin in 1902, Plehve in 1904, and Stolypin in 1911.

facto segregation between the Jewish and non-Jewish populations in imperial Russia. The suppression of Jewish rights was exemplified by the imposition of a numerus clausus for Jews at institutions of higher learning in 1887, as well as a quota on the number of Jewish students allowed to matriculate.[4] In addition, Jews were forbidden to settle in the countryside, even within the Pale of Settlement, and were barred from employment in the civil service. These measures marked a dramatic change in official policy under Tsar Alexander III and had a significant impact on the economic opportunities of Jews relative to the non-Jewish population. Figure 2.1, based on data from Grosfeld, Sakalli, et al. (2020), shows the spatial distribution of Jews and anti-Jewish outrages (pogroms) in imperial Russia. According to traditional Jewish historiography, the regicide of Alexander II and the resulting wave of pogroms that rocked the settlement area until 1884 served as a powerful reminder to Jews of the futility of their assimilation efforts.[5] These events triggered a massive exodus of Jews to other countries and fostered the growth of a radicalized Jewish national movement.

Figure 2.1.: Tsarist repression in the Pale of Settlement

(a) Share Jews

(b) Pogroms
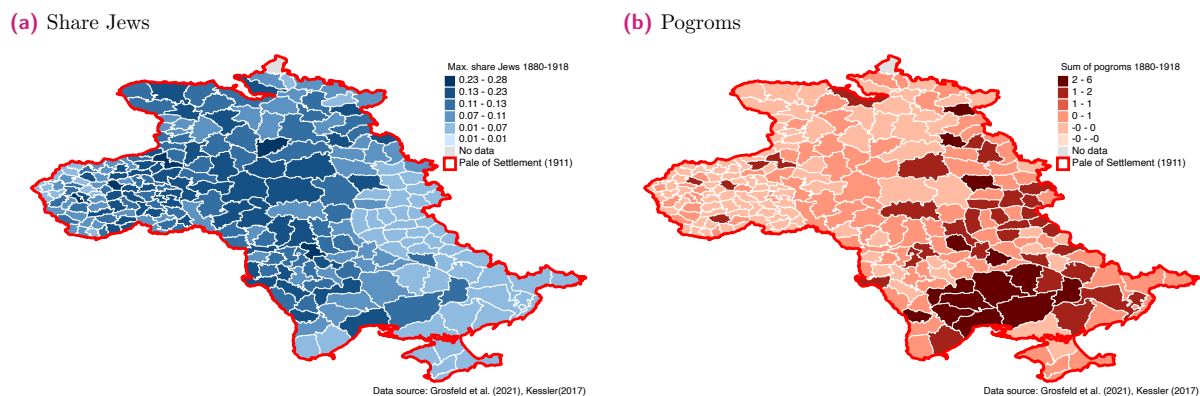
During the 1880s and 1890s, revolutionary organizations proliferated in the cities of the Pale region, including Vilnius, Minsk, Odessa, Gomel, and Warsaw, largely driven by young people such as workers, intellectuals, high school students, and university students. Initially, students and members of the intelligentsia formed self-defense groups that gradually evolved into revolutionary activism, targeting pogrom perpetrators, police officers, and officials who initiated and supported anti-Jewish violence by throwing bombs and even assassinating them. By 1903-04, these anarchist groups, which were mostly or exclusively composed of Jews, had become widespread in major cities such as Bialystok, Nezhin, Odesa, Ekaterinoslav, and Zhytomyr. The widespread support for terrorism and other radical tendencies among intellectuals reflected the belief that social problems could only be resolved by destroying the enemy (in this case, the authorities) rather than by developing new mechanisms of interaction between the authorities and various groups in Russian society (Akhiezer 2013, p. 563).

Anti-Semitism, both popular and state-sponsored, played a significant role in the spread of Marxism among the growing Jewish artisan class, the smaller proletariat, and the more radical factions of the Jewish intelligentsia in the Russian Empire (Shtakser 2014, p. 8). The founders of the Vilna revolutionary cell, including Aron-Shmuel Lieberman (1844-80), Aron Zundelevich (1851-1923), and Vladimir Iokhelson (1855-1937), all studied at the State Rabbinical Seminary in Vilna. Members of this group later became prominent members of the Narodnaya Volya (People's Will), which was responsible for the assassination of Alexander II. By 1880, five of the seven leading members of the People's Will were Jews[6], and from 1885 to 1890, one-fifth to one-third of the membership in the south and southeast of the empire were Jews (Haberer 1995, p. 46; Naimark 1983, pp. 92-5, 202–11). Jewish leftists such as Arkady Kremer, Lidia Akselrod, Leon Jogiches, and Tzemach Kopelson also joined the growing Social Democratic movement. The number of Jews in the Russian political elite and in other organs of power increased dramatically during 1917. The Jewish Federation (All-Jewish Workers' Federation in Lithuania, Poland, and Russia),

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[4] Dubnow (1920) notes that the admission of Jews to the university was limited to 7% within the Pale of Settlement and 3% outside the Pale. For common schools, the admission rate was 5% within the Pale and 10% outside the Pale (Dubnow 1920, p. 29 & 157).

[5] See Section 2.3.1 for further information on the Pale of Settlement and Section B.1 in the Appendix for contextual information on the Okhrana.

[6] These were Abram Bath, Boris Orzhich, Natan Bogoraz, Zacharii Kogan, Chaim Lev Shternberg (Haberer 1995, p. 46; Naimark 1983, pp. 92-5, 202–11). See also Schapiro (1961, pp. 148-67).

founded in Vilnius in 1897, was the first Marxist party with a large following. Jews were also instrumental in the founding of the All-Russian Social Democratic Labor Party in 1898, the most important Marxist grouping, and the Socialist Revolutionary Party, the successor to the Populists, in 1902 (Schneiderman 1976, pp. 212-7).

Despite the fact that Jews were prominent among anarchist terrorists and overrepresented in the wider Russian revolutionary movement, the Jewish nationalist movement presented a contradictory situation. In a conversation with Zionist leader Theodore Herzl, Count Sergei Witte, the chairman of the Council of Ministers, highlighted that Jews accounted for half of the membership of all revolutionary parties in Russia in 1903, despite being just six million of the total population of 136 million (Schapiro 1961, p. 148).[7] The BUND, a distinctly Social Democratic/Marxist movement, eventually merged with the Russian Social Democratic Labor Party as an independent branch. Its objectives were moderate and non-separatist, aiming for cultural autonomy within Russia and opposing Zionism, resulting in it not prioritizing terrorist tactics and using them sparingly. Although the BUND tended to side with the Bolsheviks during the 1905-7 revolution, it later switched to the more moderate Mensheviks within the Russian Social Democratic movement (Stepanova 2021, p. 309)

Although Jews did not have a prominent role in the 1905 Revolution, it was a significant event for them as a group with their own concerns and as one of the non-Russian nationalities in the empire (Shtakser 2014, p. 27). During the period between 1881 and 1905, Jews experienced severe violence, which was widely viewed as a result of the Russian autocracy's brutal policies. The tsardom was accused of using violence against its citizens, particularly Jews, with the Okhrana seen as the main agent behind most of the pogroms, which would not have been possible without its involvement. Some historians suggest that the Okhrana specifically targeted Jews as revolutionary conspirators during this time, using the forged Protocols of the Elders of Zion as a basis, although the exact origin of the document is unclear (Ruud and Stepanov 1999, p. 203). As integration into the existing political systems was no longer seen as feasible, many Jews turned to socialism as a means of integrating into society.

2.2.3. Russian Revolution & Political Transition

After the fall of tsarism in March 1917, the Provisional Government took over the leadership of the country and dissolved the political police structures of the tsarist empire. The government announced general elections to the Constituent Assembly for November 25-27, 1917. However, the Bolsheviks overthrew the Provisional Government on November 7, 1917, in the midst of the ongoing election campaign that had begun in September. Because of their desire to legitimize their seizure of power, the Bolsheviks allowed the elections to continue. Nevertheless, no majority coalition with Bolshevik participation emerged from the elections. The election results, which were seen as an expression of the popular will, were declared invalid after only two days (Pipes 1990, pp. 546-7; Andrew and Gordievsky 1990, pp. 39-40). Despite this, the elected deputies, with nearly a quarter of the vote, established the Constituent Assembly on January 18, 1918, only to dissolve it the next day by ratifying a resolution (Pipes 1990, p. 854). The historical significance of these elections is disputed, in part because of their impact on the course of Russian history (Rabinovitch 2009; Protasov 1997). In Lenin's own words:

> The dispersal of the Constituent Assembly by Soviet authority [was] the complete and open liquidation of formal democracy in the name of the revolutionary dictatorship (Pipes 1990, p. 556, citing Trotzky's Lenin reference in Pravda No. 91, p. 1 on April 24th, 1918)

However, the Electoral Act of 1917 is noteworthy for several reasons. First, it extended suffrage to all male and female adults over the age of 20 and lowered the minimum voting age for soldiers by two years. It also introduced constituency-specific proportional representation, with different lists of candidates in each of the 73 constituencies, whose seats were allocated according to the ratio reached. Political parties could form coalitions in one constituency and run independently or not at all in another. Although in most districts elections were held as scheduled on November 25-27, 1917, in some areas they had to be postponed for up to three months, while in others they were canceled altogether. Nevertheless, the elections took place throughout the former Russian Empire, with the exception of Poland and the provinces on Russia's western and northwestern borders, which were occupied at the time. Despite some irregularities in some remote areas, turnout was impressive, with 44.4 million votes cast. According to Pipes (1990), about 70% of eligible voters went to the polls in Moscow and St. Petersburg, while in some rural areas turnout reached 100% (Pipes 1990, p. 540).

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[7] According to the 1897 census, over 5.6% of the Russian population were Jews.

According to Pipes (1990), the Bolsheviks had an average vote share of 24% at the district level, which increased to about 30% when combined with the Social Revolutionary deputies. In the fifteen most developed industrial provinces between Moscow and St. Petersburg, however, the Bolsheviks did much better, receiving on average about 46% of the vote, while their share of the vote in the other parts of the country was generally less than 20%. The Kadets surprised the Bolsheviks with their high turnout, although they received less than 5% of the vote. The Bolsheviks feared the Kadets because of their large and active supporter base, superior organization, and larger number of newspapers. The Kadets' superior financial resources and their lack of commitment to a common social ideal or fear of counterrevolution made them a serious opponent. On the national level, however, the Kadets did not do well and, instead of a significant defeat, experienced a walloping "washout" (Pipes 1990, p. 542, citing p. 338 in O.N. Znamenskii's "Vserossiiskoe Uchreditel'noe Sobranie"). In contrast, the Kadets did well in the large urban centers, which the Bolsheviks saw as a crucial battleground to compensate for their poor performance in the countryside. Thus, in cities such as St. Petersburg and Moscow, the Kadets secured second place behind the Bolsheviks, with 26.2% and 34.2% of the vote, respectively. Moreover, the Kadets surpassed the Bolsheviks in 11 of 38 provincial capitals, and in many others they came close to victory (Pipes 1990, pp. 542-3).

The 1917 Constituent Assembly elections provide a fascinating glimpse into the prevailing public mood of the period, despite the ongoing war, increasing anarchy, civil unrest, and internal migration. However, determining regional turnout accurately is difficult due to the challenges noted above and the difficulty of keeping accurate records (Rabinovitch 2009, pp. 206-7; Aust 2017, p. 130). Between January 1, 1915, and July 1, 1917, the refugee population reached a total of 7.4 million, with annual increases of 2.4 and 2.8 million in 1915 and 1916, respectively (Gatrell 2005, p. 212). lthough Russia had lost Poland, Lithuania, and parts of Belarus in November 1917, a considerable number of Russian Jews remained within the country's borders. They had been forced to leave the front lines during the Russian withdrawal from Poland and Galicia in 1915 or had been deported. The largest concentration of Russian Jews was found in the Baltic and Russian Poland (the provinces that formed the Congress Kingdom, after 1863 the Vistula region), where turnout was relatively complete. Therefore, the available data on Jewish turnout in these western provinces should be taken seriously, as shown in the Figure B.2.2 in the Appendix, which illustrates the lost territories in the eastern part of the former empire.

Jewish communities in Volhynia, numerous White Russian towns, and much of the Baltic region were forced to migrate eastward after the empire's collapse. In some areas, such as Kovno and many Kurland provinces, the entire Jewish population had to relocate (Gatrell 2005, pp. 22-3 & 145-50). Despite ongoing restrictions, more than two-fifths of those expelled in 1915 resettled in Russian areas previously off-limits to them, such as Voronezh, Tambov, or Penza (Gatrell 2005, p. 145). The lifting of all residence restrictions on Jews by the Provisional Government in March 1917 led to even greater numbers moving to cities that had previously been restricted (Aust 2017, p. 114). Despite the loss of these provinces by Russia, the mass relocation of civilians during the war, and the interethnic dynamics in the new "polyglot" cities where the refugees resided, this may have contributed to the strengthening of group identity among minorities (Gatrell 2005, p. 200; Rabinovitch 2009).

2.3. Data

2.3.1. Administrative Coverage

Our dataset primarily consists of information from the 1897 census of the Russian Empire, which is arranged by province (guberniya) and includes 89 volumes. Our research focuses on the European region of the Russian Empire, which includes the Pale of Settlement, an area designated in 1835 as a settlement area for European Jews. The Pale encompasses 15 provinces in western European Russia, including 10 provinces of the Polish Congress, parts of present-day Latvia, Lithuania, Poland, Russia, and Ukraine, as well as all of present-day Belarus and Moldova. Although the inhabitants of the Pale area were also affected by events outside this area, part of our research focuses precisely on this particular region. Figure B.2.1 in the Appendix illustrates the boundaries of the Pale within contemporary Eastern Europe, which we created based on information from G. Kessler and Markevich (2017) and the Eurostat GISCO database.

For our Pale sub-sample, we collected data on 25 provinces in the settlement area and adjacent provinces, including Livonia, Smolensk, Pskov, Orel, Kursk, Kharkiv, and Courland. Although Courland was not officially part of the

Pale, it was considered as such in the early 19th century due to its significant Jewish population (Spitzer 2015, p. 53). The Pale was divided into four regions: Poland, Belarus-Lithuania (including Courland), the Southwest, and New Russia. These four provinces bordered the Black Sea and were acquired by Russia from the Ottoman Empire in the late 18th century. Originally, the latter two regions were not part of the Polish-Lithuanian Commonwealth and were not subject to restrictions on Jewish settlement, but were later included in the Pale. We used dummy variables to identify districts within the Pale and adjacent provinces, and our sample included 296 districts in the 26 provinces of European Russia, 229 of which were part of the Pale.[8] By 1897, these districts had substantial Jewish populations, exceeding 700,000. However, there were some differences within the Pale. Two eastern provinces, Chernigov and Poltava, were relatively sparsely populated, although they were part of the Pale. The latter were historically located on the border between Poland and Russia and had been a semi-autonomous hetmanate under Russia before the partitions of Poland. We distinguished between these areas within the Pale as the former provinces of the Polish-Lithuanian Commonwealth, where Jewish settlement was dense due to mobility restrictions, and the remaining provinces such as Courland, Left Bank Ukraine, and New Russia, where Jews were less numerous due to recent settlements or restrictions on settlement (Spitzer 2015, p. 53).

The Jewish population in the Pale region was divided into two groups according to their religious and linguistic affiliation. These two categories overlapped to a considerable extent, with almost all Yiddish speakers being religious Jews and vice versa. Within the Pale, there were approximately 4.9 million religious Jews and 4.8 million Yiddish speakers (excluding Kurland). The slight difference between the two groups is due to the fact that some individuals who reported a language other than Yiddish as their mother tongue were grouped under other nationalities for the analysis of occupational data. These languages included Polish, Russian, German, Tatar (spoken by the Krymchaki in the Crimea), Lithuanian, and others, resulting in the exclusion of 105,426 persons from the total of 4.9 million religious Jews (Kahan 1986, p. 4 & footnote 3). Even after this exclusion, the Yiddish-speaking population still constituted the vast majority (99.8%) of all Jewish inhabitants in European Russia (as shown in Table 2.1). It is highly unlikely that non-observant Jews were not included in this category unless they converted to another religion. The low number of religious conversions was evident during the pogroms of the 1880s, which demonstrated to Jewish entrepreneurs that adopting a Russian cultural facade did not provide sufficient protection from persecution (Kahan 1986, p. 88).

Table 2.1.: Language-Religion Difference in Jewish community in 1897

	By religion	By language	Difference	Correlation
Pale of Settlement	4,930,655	4,825,229	105,426	0.998
Adjacent to the Pale	72,564	64,821	7,743	0.997
Outside the Pale	143,366	123,372	19,994	0.996
Total European Russia	5,070,588	4,945,297	125,291	0.999

Data drawn from G. Kessler and Markevich (2017).

To identify Jews in our study, we used their reported native language. Table 2.2 from Spitzer (Table 6.1 2015, p. 199) contains information on the percentage of Jewish inhabitants in various provinces of the Russian Empire, including provinces within and adjacent to the Pale of Settlement as per the 1897 census. As stated by Spitzer (2015), Jews accounted for approximately 37.5% of the urban population and 12% of the total population in an average province within or near the Pale. Provinces outside the Pale border had a much smaller proportion of Jews. Figure 2.3, which is based on data from Buggle and Nafziger (2021) and G. Kessler and Markevich (2017) illustrates the urbanization rate in the districts of Pale of the Settlement. Thus, Jews were mostly an urban minority, as mandated by law. Despite the general lack of literacy, Jews in the Pale had a higher literacy rate than gentiles, with about half of the working-age population, including women, classified as literate, a 20% literacy advantage.

Jews in the Pale worked mainly in non-agricultural fields, with only 2.7% employed in agriculture. In contrast, over 60% of non-Jews worked in agriculture, indicating that Jews were significantly underrepresented in this sector. The largest Jewish employment sector was manufacturing, which was located primarily in urban areas and employed 36% of the Jewish labor force. The second largest sector was commerce, which accounted for 30% of the Jewish

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[8] Rowland (1986) notes that 226 localities in the 25 provinces of the Pale with more than 5,000 inhabitants had no Jewish community, and those Jews not included in this list lived either in villages or in larger towns where Jews were a small minority.

workforce. These results indicate that Jews were urban-oriented and preferred to live and work in cities. However, as Spitzer (2019) argues, the geographic dispersion of Jewish communities and the differences in their occupational distribution are due to the negative effects of ethnic congestion in the rural service niche. As the Jewish population grew, they dispersed occupationally as production workers and geographically as frontier workers in areas with fewer Jews. Although very few Jews were directly employed as agricultural laborers, they were integrated into the rural economy through various commercial transactions, as Grosfeld, Sakalli, et al. (2020) confirms. However, wildly fluctuating crop yields posed a significant threat to Jewish merchants in agriculture, especially during crop failures such as the famine of 1891-92, which resulted in the deaths of half a million people (Charnysh 2022). Since much of their income was spent on food consumption, Jews were highly vulnerable to fluctuations in the price of agricultural products as a result of famines. In addition, between 1897 and 1915, about 1.3 million Jews emigrated from the Pale to the United States, Western Europe, and Palestine, although the Jewish population of the Pale remained large because of the high birth rate and declining mortality rate (Kahan 1986, p. 32; Altshuler 1987).

Table 2.2.: Occupational and residential specialization of Jews

Category	Perc. in category		Perc. Jews	Over-rep. Jews
	Jews	Non-Jews		
Urban ($> 10,000$)	0.375	0.092	0.341	4.073
Countryside	0.519	0.891	0.069	0.583
Literacy (ages 20–60)	0.506	0.299	0.172	1.692
Labor force	0.298	0.265	0.125	1.124
Sectors				
Agriculture	0.027	0.603	0.006	0.045
Commerce	0.300	0.013	0.765	22.771
Manufacturing	0.355	0.109	0.317	3.246
Professional services	0.047	0.025	0.209	1.850
Personal services	0.175	0.191	0.116	0.916
Transportation	0.031	0.017	0.206	1.816
Other	0.065	0.041	0.186	1.603
Population (1,000s)	4,843.1	38,165.0	0.113	

The data presented in this Table is sourced from Spitzer (Table 6.1 2015, p. 199) and provides statistics on the Jewish and non-Jewish population within the Pale of Settlement (including Courland), based on their reported mother tongue. Column 1 and 2 show the average values of each category for the Jewish and non-Jewish populations, respectively. Column 3 reports the percentage of Jews within each category, while column 4 indicates the degree of over-representation of Jews within that category. The urban indicator refers to those living in cities with a population above 10,000, while countryside refers to those living outside of cities. The literacy rate represents the proportion of people aged 20-60 who are literate in Russian, non-Russian, and possess above-elementary education. For the rows showing means of sector indicators, the percentages in columns 1 and 2 are based on the labor force, not the total population. The source of this data is the 1897 Russian Census provincial volumes, Tables XV, XXI, and XXII.

2.3.2. Okhrana

We obtained the Okhrana data from the Hoover Institution at Stanford University, which was collected by Grigoriadis (2023). The archives were under lock and key for more than 30 years before they were unveiled in 1957. The vast collection includes 200 boxes containing more than 97,000 documents, 164,000 identification cards, 287 scrapbooks and 1.5 meters of photographs. The CIA was particularly interested in these files during the Cold War because they shed new light on Soviet-era operations and provided insight into Russian intelligence methods. We coded information from these archives, including lists of individuals indicted and convicted by the Imperial Secret Police, undercover Okhrana agents in Europe and the United States, foreigners expelled from Russia on espionage charges, Russian citizens under surveillance, and dismissed agents both in Russia and abroad.

The dataset we use contains information on individuals under surveillances by the Imperial Secret Police between 1886 and 1900. It includes their names, surnames, religion, age, and origin region. The Bolsheviks were heavily infiltrated by the imperial secret police, as can be seen from other Okhrana files remaining in Russia. This infiltration

had already occurred by the time the Social Democratic Labor Party split into Bolsheviks and Mensheviks in 1903. The details provided in the archives were so extensive that, despite the loss of some records after the February Revolution, the remaining archives have become one of the most important documentary sources for the early history of the Bolsheviks (Andrew and Gordievsky 1990, p. 32). Leading Bolsheviks such as Trotsky (number 352) are mentioned in Figure 2.2.

Figure 2.2.: Archival material from the Okhrana Paris records at Hoover Institution

Data source: Grigoriadis (2023).

We used digitized archival sources from the Paris branch of the Okhrana, which contain data on all individuals monitored in a given province, to gain insight into local repression and radicalization trends during the last three decades of the Tsarist Empire (Grigoriadis 2023). To ensure that our dataset is accurate and free of redundancy, we removed all duplicates. In this way, we were able to capture all new revolutionary opposition movements that emerged during the period 1886-1900, i.e., during the transition to the rule of Nicholas II and the first six years of his reign. We therefore capture the Jewish mobilization that followed the famine of 1892 and the rise of anti-Semitism in the 1880s that culminated in the wave of pogroms in 1902/03. We have classified the state crimes with which the monitored individuals were charged into five groups: Dissemination of anti-government propaganda, membership in a subversive organization, participation in riots, and participation in assassinations, to create a graded indicator of local radicalization. In cases where individuals were investigated for multiple offenses, we assigned them to the most serious category, e.g., assassinations instead of propaganda. The table shows that most individuals in our sample were scouted for their membership in anti-government organizations or parties, followed closely by their involvement in assassinations.

To track the educational attainment among revolutionaries, we used a three-tier system based on primary, secondary and tertiary education levels. Occupations associated with white-collar work or individuals with future prospects, such as students, were assigned to a tertiary education level. In contrast, occupations associated with blue-collar work, such as blacksmiths, were assigned to a secondary level of education. Although women were not permitted to attend state educational institutions prior to 1905, they became an integral part of the Russian student body and

Table 2.3.: The distribution of surveillance targets' criminal activities

	Frequency	Percentage	Cum. Percentage
Assassinations	300	31.61	31.61
Membership	368	38.78	70.39
Other	41	4.32	74.71
Propaganda	202	21.29	96.00
Riots	38	4.00	100.00
Total	949	100.00	

educational elite, particularly in the Pale of Settlement during the last two decades of the Empire (Dudgeon 1982). Therefore, we assigned tertiary education levels to individuals with female given names and noble backgrounds. Our data suggest that the typical revolutionary was a young man, most likely of Jewish descent, who possessed at least a secondary education. "Our" typical revolutionary was furthermore primarily monitored for their involvement in subversive organizations and showed only a slight tendency to participate in assassinations (see Table 2.3). The data presented in Table B.3.4, based on data from Grigoriadis (2023), support the assumption that revolutionary activities were mainly concentrated in Russia, Ukraine, and most of Poland. Figure 2.3 then shows revolutionary activities in the Pale of Settlement zone.

Figure 2.3.: Tsarist repression in the Pale of Settlement

(a) Urbanization 1913

Data source: Buggle and Nafziger (2019), Kessler(2017)
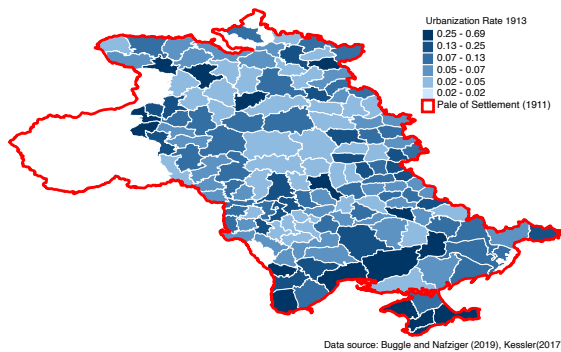
(b) Revolutionary activity 1880-1900

Data source: Grosfeld et al. (2022), Grigoriadis (2023), Kessler(2017)
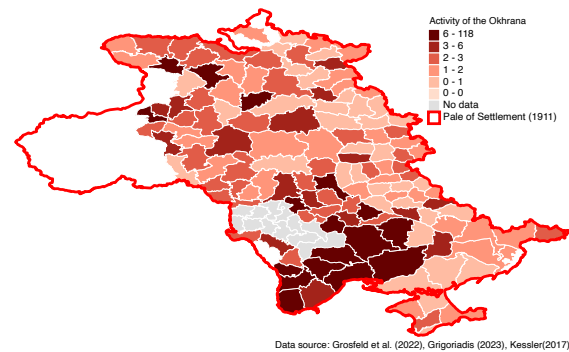
The prevalence of underground activities in larger cities in European Russia raises concerns about spatial autocorrelation, which could inflate our statistics and violate certain Gauss-Markov assumptions (Kelly 2019). One concern is that these activities were more likely to be successful in larger cities, which made it easier for the Okhranniki to monitor their networks of agents and informants and recruit additional informants. Another concern is the possibility of unobserved factors that may be spatially correlated and influence reported unrest in specific cities or links between underground groups in different cities. To address this issue, we used the Getis-Ord "G" statistic (Getis and Ord 1992) and computed it using Pisati (2001)'s `spatwmat` to identify clusters of high and low values in our data. Our analysis confirms that there are statistically significant differences between the expected and actual values of the G-statistics for education and the individuals studied, indicating the presence of "hot spots" of revolutionary activity in densely populated urban areas. As shown in Table B.3.5 in the Appendix, there is a greater spatial clustering of high values for revolutionary activity than would be expected by chance. This finding is consistent with the idea that clandestine activity and surveillance networks are more prevalent in densely populated areas, particularly in cities. We therefore restrict our sample to the European part of Imperial Russia, where most revolutionary activity took place, and focus on the macroregions of European Russia and the Vistula region.

In addition, our surveillance data are in part incomplete, particularly with respect to the location of the arrest, the level of education, and the type of crime committed. To address this problem and to ensure that our parameter estimates are not biased, we use multiple imputation techniques (Buuren et al. 1999).[9] We performed five rounds

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[9] We used logistic regression models to determine whether any of the control variables in our dataset predicted missingness in our surveillance data. Our analysis found that none of the control variables, such as religious composition, the proportion of middle

of imputation using truncated regression, with a lower bound of 1 and an upper bound of 4 (Rubin 1996; Buuren et al. 1999). Finally, we estimate the analysis at the district level by first consolidating our monitoring data at the individual level for each province and then extending it to the district level, taking into account the population of the district.

2.3.3. Constituent Assembly

After the Bolshevik coup d'état, violent clashes broke out in several cities, causing local election commissions to either postpone or extend the elections. In some regions, elections were even postponed until December 1917 or 1918, while in other provinces there were no elections at all, but this is not relevant to our analysis, as we are only examining differences in turnout within provinces. Official publication of election results was limited to the local level. To determine our primary dependent variable, we used a volume written by Russian historians led by Lev Protasov that records the vote shares of different candidate lists into 18 larger units (Protasov et al. 2014). In the case of joint lists, we used the order given by Protasov and assigned smaller parties in joint lists to the largest party. Thus, in the case of any joint list in which the Bolsheviks cooperated with local interest groups, their share of the vote was assigned to the Bolshevik party, which in this case was the largest party (Castañeda Dower, Markevich, et al. 2021). The specific party group assignments are shown in the Table B.3.2 in the Appendix. It is worth noting that the Bolsheviks ran without an official program and relied on broad appeals to workers, soldiers, and peasants to secure votes (Pipes 1990, p. 541). They ran independently in 48 constituencies and formed a coalition with the Mensheviks in six provinces: Altai, Bessarabiya, Irkutsk, Kiev, Liflyandia, and Tobol'sk. They did not participate in the provinces of Olonetz, Samarkand, Turgay, and Ural, and their share of the vote in these provinces is counted as zero (Castañeda Dower, Markevich, et al. 2021).

Our goal is to create a comprehensive left-right index that encompasses a party's stance on various issues such as free markets, economic incentives, traditional values, morality, the welfare state, public education, market regulation, and workers' rights, similar to the indices proposed by Budge et al. (2001) and Klingemann et al. (2006) in the *Manifesto Project Database*. These indices will serve as a measure of a basic political axis that distinguishes parties based on their position on these issues (Moriconi et al. 2022). Similar to Castañeda Dower, Markevich, et al. (2021), we used the 1917 Arzamas project to position parties on a left-right scale, with zero being the midpoint and negative values representing left-leaning parties and positive values representing right-leaning parties.[10] The parties were classified as follows: Left: Bolsheviks (-5.2), Socialist Revolutionaries (-4.9), Anarchists (-4.5); Center: Socialist Revolutionaries of the Center (-2.2), Menshevik Internationalists (-1.5), Menshevik Centrists (-1.1), Right Socialist Revolutionaries (-0.75), Menshevik Defensists (+1.25); Right: Black Hundreds (+5.75), Kadets (+6).[11] We have classified the other constituency groups on the basis of their demand for redistribution and pursuit of national interests as follows: Peasants (-4.5), Cooperatives (-3.0), Social Democrats (-2.2), Other Socialists (-2.2), Others (0), Jewish Lists (+2.2), Muslim Lists (+2.5), Other Minorities (+2.5), Orthodox (+4), and Liberals (+5.75). To create our election indicators, we used both the Arzamas project and our own left-right classification.

2.4. Empirical Strategy

To examine the relationship between political preferences and the level of radicalization in the Russian population, we use a set of political indicators and examine the votes of the main political parties from the results of the 1917 Constituent Assembly. Our goal is to analyze these factors in the context of the level of radicalization, which we measure by the number of people who were under Okhrana surveillance and persecuted. To ensure the accuracy of our analysis, we include constituency fixed effects and distinguish between competing political parties in each district. By "constituency" we mean districts that belong to a particular constituency but may also be part of another province. We propose the following econometric model:

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management variables surveyed by Grosfeld, Rodnyansky, et al. (2013), individual income associated with a particular estate, or educational attainment, had a significant correlation with missingness in our surveillance data. Thus, it can be concluded that our data are missing completely at random and most likely the result of copying errors in the data collection. Tables B.3.6 – B.3.9 in the Appendix confirm the randomness of our missing data.

[10] See "Who are you in 1917 Russia?" at the https://arzamas.academy/materials/1269 link, last accessed April 24, 2023.

[11] The Black Hundreds and the Anarchists were not electable parties.

Figure 2.4.: Voting behavior in the 1917 Constituency Assemply

Vote share for the moderate and far left parties
- 0.89 - 0.89
- 0.45 - 0.89
- 0.20 - 0.45
- 0.06 - 0.20
- -0.00 - 0.06
- -0.00 - -0.00
- No data
- Pale of Settlement (1911)

Vote share for the centrist parties
- 0.99 - 0.99
- 0.82 - 0.99
- 0.64 - 0.82
- 0.42 - 0.64
- -0.00 - 0.42
- -0.00 - -0.00
- No data
- Pale of Settlement (1911)

Vote share for the moderate and far right parties
- 0.28 - 0.91
- 0.14 - 0.28
- 0.08 - 0.14
- 0.04 - 0.08
- -0.00 - 0.04
- -0.00 - -0.00
- No data
- Pale of Settlement (1911)

Vote share for the most right party position
- 0.96 - 2.24
- 0.48 - 0.96
- 0.25 - 0.48
- 0.16 - 0.25
- -0.00 - 0.16
- -0.00 - -0.00
- No data
- Pale of Settlement (1911)

Data source: Kessler (2017), Protasov (2014)

$$\text{POL}_{ij} = \beta \times \text{Okhrana}_{ij} + X_{ij}\gamma + \phi_j + \epsilon_{ij} \qquad (1)$$

In our model, we use POL_{ij} for a set of policy indicators that we calculate based on the *Manifesto Project Database* developed by Budge et al. (2001) and Klingemann et al. (2006). This project has been analyzing parties' election manifestos since 2009 to examine their policy preferences. In particular, we focus on five indicators that help us understand the political landscape: the overall political polarization, ideological center of gravity, left-right electoral groups, and the number of votes for each party contributing to our electoral group classification. In addition, we calculated the minimum and maximum left-right orientation and a party-specific median party dummy variable.[12] We define different groups of voters based on the percentage of votes received by political parties in certain categories. For example, the far left includes the Bolsheviks and the left Social Revolutionaries, while the moderate left includes the peasant and cooperative lists. The center includes the Mensheviks and the center Social Revolutionaries, the Mensheviks International, the right Social Revolutionaries, and the Mensheviks Defensists. The moderate right is represented by special interest groups such as Orthodox Muslims, Jews, and other minority groups. Finally, the far right includes the combined vote of Liberals and Kadets. We measure the intensity of local Okhrana oppression with our composite variable Okhrana_{ij}, which is described in detail in 2.3. Our model includes several other explanatory variables, such as the total number of individuals monitored, a gender dummy variable, and four indicators of the severity of crimes against the Tsarist regime that measure local radicalization intensity. The intensity of local radicalization is graded by the severity of the crime as follows: 1) dissemination of propaganda, 2) membership in subversive organizations, 3) organization of and participation in riots, and 4) organization of and participation in assassinations and were imputed during data processing.

Particularly relevant to our account is the fact that throughout Russian history, violent political upheavals, including uprisings, assassinations, wars, invasions, political strikes and revolutions, have led to increased surveillance

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[12] We use the Election Level Do-file in order to create these indicators in STATA.

behavior by political authorities. These events, which often involved a change in ruler identity, were associated with increased uncertainty about the future and domestic upheaval. These events included the assassination of Alexander II (1881), the conflict in Manchuria (1903), crushing defeat in the Russo-Japanese War (1904-5), general strikes and the first Russian Revolution (1905), a series of defeats in World War I (1916-8), and the February and October Revolutions and subsequent abdication of the throne by Nicholas II (1907), followed by civil war (1918-22). The abdication of Nicholas II thus had the potential to reverse important social reforms (for former serfs) and unofficial bureaucratic action structures (for marginalized Jews) (Grosfeld, Sakalli, et al. 2020).

For although the Russian economy was in the early stages of industrialization in the 1880s, its production was still largely linked to agriculture, especially grain cultivation (Allen 2003). The change of leadership from Alexander II to his son Alexander III, might have increased the insecurity among former serfs, who made up 43% of all rural residents in Russia in 1858, due to a fear of being forced back into serfdom, even if it was not ultimately reintroduced This historical connection between serfdom and peasant unrest, as well as the likelihood that grievances and repertoires of struggle survived emancipation, is a compelling reason to study this connection (Buggle and Nafziger 2021). To examine whether regions with a greater prevalence of serfdom had a higher vote share for the (far/middle) left, right, and center, we used district-level replication data from Buggle and Nafziger (2021) and determined the proportion of the rural population in each district in 1858 that was either field or household serf. To account for possible demands for land redistribution, we used the proportion of private agricultural land per rural resident in 1913. In addition, we included a number of control variables from Buggle and Nafziger (2021), such as an index of podzolic soils, distance from Moscow and the provincial capital, and precipitation, to account for other geographic factors. We also collected crop year figures for major staple crops such as winter rye, spring wheat, barley, oats, and potatoes.

In addition, during the reign of Alexander II, some restrictions on the residence and employment of Jews were lifted, and various regulations were largely ignored.[13] These facilitationsled to an increase in the number of Jews in liberal professions such as doctors, lawyers, midwives, editors of Russian-language newspapers, and journalists, resulting in the emergence of a significant stratum of the Russian Jewish intelligentsia toward the end of the 19th century, which was integrated to varying degrees into Russian society, particularly rural society (Akhiezer 2013, p. 562). Under his successors, however, government policy toward Jews reversed, leading to a series of economic dislocations in the employment structure of Jewish communities. To analyze this, we control for anti-Jewish sentiment among the non-Jewish population. Specifically, we rely on Grosfeld, Sakalli, et al. (2020)'s replication data on ethnic composition by occupation in each district and literacy rates among Jews and non-Jews (as of 1897).[14] We include a number of control variables, such as major occupations, and their ethnic composition, which can be found in the 2.2 and B.3.3 Tables in the Appendix.

Moreover, Lenin believed that the support of middle-class industrial workers would ultimately lead to the victory of the Bolshevik Revolution. To test this hypothesis, we included a control variable that accounted for the proportion of industrial workers in a given district. From the 1897 census, we obtained data on the subsectors of dependent or self-employed workers by province, which we then adjusted to the district level by weighting with the district population. To define industrial workers, we follow a similar methodology to Buggle and Nafziger (2021), which includes individuals employed or self-employed in specific industries such as mining, metalworking, garment manufacturing, residential construction, and general construction (categories 21 to 40 from G. Kessler and Markevich (2017)).[15] To balance this indicator, we also included a variable for agricultural workers, which includes individuals employed in agriculture, livestock, and sericulture (categories 17 through 19 from G. Kessler and Markevich (2017)). We further control for potential language barriers to political agitation by controlling for the proportion of speakers of East Slavic languages, i.e. Russian, Ukrainian, and Belarusian (Castañeda Dower, Markevich, et al. 2021). We supplement these controls with district-level data on the urban-rural and male-female breakdowns for the 1897 census from www.demoscope.ru,

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[13] Jews residing illegally outside the settlement area were no longer allowed to be harassed by the police, and Jewish merchants of the highest commercial class and Jews in medical professions were allowed to settle with their families in towns outside the Pale. In addition, compulsory military service for school leavers was reduced to one year (Shtakser 2014, pp. 22).

[14] We use their grid-level dataset, which we later consolidated during the data preparation phase to make it accommodating to our district-level dataset.

[15] Our categorization includes all employed or self-employed in mining and quarrying, metal smelting, fiber processing, animal product processing, woodworking, metal processing, mineral processing, chemical and allied product manufacturing, distilling, brewing and honey fermenting, other beverage manufacturing, and fermented materials manufacturing; Vegetable and animal food processing; tobacco and tobacco products manufacturing; printing; instrument making; jewelry making, painting, cultural and luxury goods manufacturing; apparel manufacturing; housing construction, repair and maintenance and general construction; railroad car and wooden ship building; other industrial workers (G. Kessler and Markevich 2017).

the research project of the Higher School of Economics in Moscow. Finally, we account for changes in the sex ratio due to the mobilization of men during World War I using the Statistical Yearbook for population numbers in a district, that we obtained from `histmat.info`. The correlations of the explanatory and control variables with political groups are presented in Tables B.3.12 – B.3.13 in the Appendix and supplemented by descriptive statistics in Tables B.3.11 – B.3.10.

To clarify, our main focus is on the coefficient β, which may have different effects on policy outcomes depending on the interpretation of history and narrative. We expect a positive correlation between β and the severity and visibility of the crime studied. This suggests that if anti-tsarist crimes become more visible, this would lead to a higher vote share on the right side of the political spectrum. Conversely, a peak in the degree of violence of these crimes could lead to more support for the left. Overall, given the results of the 1917 Constituent Assembly, this would lead to greater polarization at the district level. Two different views of how the electorate responded to social radicalization are consistent with the idea that voters' perceptions of party positions, rather than objective positions, ultimately determine voting decisions. First, if the "crimes" were peaceful and/or invisible, such as membership in anti-tsarist groups or the dissemination of anti-tsarist propaganda, the extension of voting rights to minority groups such as women may have strengthened the demand for democratization and redistribution, leading to the success of leftist party lists. However, if democratic redistribution seemed unlikely, increasing inequality may have strengthened support for more extreme solutions, including revolutionary actions by the far left.

A positive effect for the far right could be due to a general shift in political preferences to the right in response to the radicalization of society, which advocates for greater public safety.[16] Daly (2002) describes the situation in Russia as a quasi-civil war in which even reasonable people reluctantly and temporarily felt the need to support extremist political elements in their struggle to preserve or restore Russia in radically opposite directions (Daly 2002, p. 40). To explore this further, we analyze the electoral outcomes for the extreme right, including the traditional conservative party Kadets and the Liberals as a joint list of industrialists and landowners, following the approach of Castañeda Dower, Markevich, et al. (2021). A negative estimate of our electoral measures for the extreme right would support the idea of a shift in the electorate to the left, since most electable alternatives were on the left. A zero or positive effect for the (far) left would suggest a radicalization of left politics. A positive estimate for the moderate/far right would support the narrative of a more (left-) authoritarian electorate responding to more radical solutions such as insurgencies and assassinations, with the main parties to the right being the Liberals or Kadets.

Based on our research findings, there is a robust and positive correlation between far-right political attitudes and the incidence of local radicalization. This implies that tsarist repression and the extent to which Russian society has become radicalized at the local level may have driven voters to turn to the right side of the political spectrum. However, we must be cautious about drawing conclusions about individual behavior from collective data. To avoid this potential pitfall, we augmented our OLS regressions with propensity score matching (PSM) and coarsened exact matching (CEM) to examine the effects of repression on the probability of voting for far-left, moderate-left, and far-right groups. While previous studies have compared the advantages and disadvantages of the PSM and CEM techniques, both approaches aim to address the problem of endogeneity in the baseline OLS model. CEM is often used as a sensitivity analysis for PSM because it involves grouping units based on covariate strata and then matching them based on those strata, thereby reducing any imbalance between the treatment and control groups (Datta 2015; Iacus et al. 2009). This is particularly useful when a nonparametric estimation strategy is preferred (Iacus et al. 2009). We run two CEM estimates with different covariates to minimize any imbalances between the treatment and control groups. The first includes latitude, longitude, distance to provincial capital, and distance to St. Petersburg, while the second also includes distance to the coast, a charcoal area dummy, podsol soil, and length of growing season. To improve the validity of our PSM estimates, we also use marginal tests to calculate the critical level of hidden bias (Γ) with respect to the significance levels of the reported average treatment effects (ATTs). Although Rosenbaum bounds account for the random assignment assumption underlying the PSM method, this approach may still be imperfect due to the potential influence of an omitted covariate on treatment group assignment (Chaudoin et al. 2018). We use nearest neighbor matching (NNM) and kernel-based matching (KBM) to implement our PSM estimates. NNM matches a treated unit with a control unit based on an approximate propensity score, while KBM

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[16] Lauchlan (2002) argues quite convincingly that public officials supported right-wing terrorists not because they were fighting society, but because they were trying to work with right-wing elements in society (Lauchlan 2002, pp. 275-81).

matches a treated unit with a weighted average of control units to minimize the difference between the propensity scores of treated and control units.

2.5. Results

2.5.1. Okhrana & Political Preferences

We begin with an examination of electoral polarization during the 1917 Constituent Assembly. Our argument is based on a two-dimensional framework for political competition in which key issues are assigned to either the economic or the cultural dimension (Hillen 2022, p. 2). In this framework, left-wing positions are distinguished as advocating redistribution, market regulation, and a large public sector, while the (extreme) right rejects wealth redistribution and any state intervention in the economy. In contrast, the cultural dimension distinguishes a libertarian attitude toward cultural, religious, and ethnic diversity from an authoritarian opposition to such diversity (Kitschelt 1994). We hypothesize that left-wing parties will pursue more redistributive policies than right-wing parties if the economic dimension is more prominent than the cultural dimension. If this is not the case, the partisan effects will dissipate. To test for the relative importance of the economic and cultural dimensions, we add gender and our radicalization measures (propaganda, membership, etc.) to our overall measure of repression. We also control for several geographic and demographic variables obtained from Buggle and Nafziger (2021) and G. Kessler and Markevich (2017) and Grosfeld, Sakalli, et al. (2020) for our Pale subsample.

Columns 1-3 of the Table 2.4 provide information on the ideological polarization of the party system in European Russia. Our aggregate index of ideological polarization of the party system is based on Dalton (2008) and is calculated on the basis of parties' positions on the left-right dimension and weighted by their election results. The index ranges from 0 to 1, with values closer to 0 indicating a less polarized system and values closer to 1 indicating a more polarized electoral system. Fitting the overall model suggests that our specifications predict the variance of the dependent variable well. We find that districts that suffered from greater repression under tsarist rule, as measured by our composite repression variable, tend to exhibit less political polarization on average, even after accounting for other demographic and geographic controls. However, despite a highly statistically significant result, the effect size remains quite small. Moreover, we discover a positive relationship between gender and political polarization that is consistently significant at the 1% level across different controls. We interpret this as some gender bias in describing criminal participation decisions, possibly due to the different roles and status of men and women in the social structure at the time. Our OLS analysis also shows that the negative polarization observed in the districts is associated with a bias in our data related to the severity or visibility of the crime. In particular, we find that districts where violent riots are more frequent also exhibit greater polarization of the electorate. This effect is ten times larger than the average Okhrana repression indicator and has the opposite direction of effect. This suggests that the intensity of public discontent, whether in the form of repression or increased radicalization in the form of riots or assassinations, may be an important factor in exacerbating political polarization.

The last decades of the Russian Empire saw an increase in revolutionary conspiracies and oppositional mass movements, which led to the expansion of the imperial security apparatus to combat the challenge. The relationship between the Okhrana, an extended arm of the tsarist government, and the Jewish minority, which bore the brunt of persecution, is therefore of particular interest. Although the Okhrana was not the originator of state-sponsored anti-Semitism, it played a role in its implementation (Andrew and Gordievsky 1990, p. 21). For example, the St. Petersburg Okhrana official Komissarov receives an official reward of 10,000 rubles for inciting anti-Jewish riots with leaflets printed on police printing presses (Hingley 1970, pp. 92-3). The goal of the tsarist government was to create a homogeneous population that would demonstrate unwavering patriotism and loyalty. However, Russian Jews, despite slow progress in assimilation, were seen as nonconforming in both respects, and many of them had become opponents of the Russian government (Schneiderman 1976). We present our results for the districts of the Pale of Settlement and the adjacent provinces in columns 4-6 of the Table 2.4. To account for other potential factors, we include control variables from middlemen obtained from Zhuravskaya et al. (2021)'s grid-level dataset and match them with our district-level dataset at the data preparation stage. Our results show more diverse electoral polarization in the Pale of Settlement than in the European territories of the Russian Empire as a whole. Surprisingly, the only statistically significant negative coefficient at the 1% level is observed in the specification without controls, which contradicts our

Table 2.4.: Polarization in European Russia and the Pale

	European Russia			Pale of Settlement		
	(1)	(2)	(3)	(4)	(5)	(6)
Okhrana	−0.103***	−0.083***	−0.045***	−0.102***	−0.056	0.038
	(0.018)	(0.018)	(0.014)	(0.026)	(0.048)	(0.060)
Male revolutionaries	0.123***	0.099***	0.058***	0.145***	0.049	−0.071
	(0.027)	(0.027)	(0.020)	(0.032)	(0.070)	(0.082)
Propaganda	0.107**	0.035	−0.027	−0.004	−0.012	0.172
	(0.046)	(0.067)	(0.052)	(0.100)	(0.143)	(0.168)
Membership	0.206***	0.162**	−0.017	0.170	0.105	0.119
	(0.055)	(0.069)	(0.054)	(0.110)	(0.101)	(0.103)
Riots	−0.162	−0.035	0.449***	−0.095	0.161	−0.812
	(0.131)	(0.168)	(0.138)	(0.206)	(0.470)	(0.621)
Assassinations	−0.185***	−0.135***	−0.028	−0.221**	0.031	−0.014
	(0.044)	(0.043)	(0.032)	(0.086)	(0.079)	(0.090)
Constituency FE	−0.000	−0.003***	−0.000	−0.001	0.001	−0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.003)
Demographics	—	✓	✓	—	✓	✓
Geographics	—	—	✓	—	✓	✓
Middlemen	—	—	—	—	—	✓
F-Statistics	7.975	13.986	31.222	5.052	14.051	11.951
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000
Imputations	20	20	20	20	20	20
Observations	384	330	330	111	82	75

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The dependent variables are based on an electoral polarization index ranging from 0 to 1, as constructed by Dalton (2008) and utilized in the Manifesto project. The demographic controls came from two sources: Buggle and Nafziger (2021) and G. Kessler and Markevich (2017) and include district location factors, such as latitude, longitude, distance to the coastline, and global distance to the provincial capital and St. Petersburg. Other factors are the length of the growing season, presence of coal territories, and type of soil. Additionally, we account for the proportion of individuals with secondary and tertiary education, the proportion of Slavs and Jews by language, and the proportion of workers in industrial and agricultural sectors. These factors are measured based on the 1897 population levels and weighted by district population levels. We further include the share of serfs in 1858 as a control for each district. Moreover, middlemen controls from Grosfeld, Sakalli, et al. (2020) reflect the Jewish minority's integration into the countryside, including the proportion of Jews among craftsmen, creditors, transport, and grain trade. These controls were obtained by collapsing a grid-level dataset.

expectation of a more pronounced effect in the districts of the Pale. However, we cannot rule out the possibility that the effects of flight, war mobilization, and lost territories played a larger role in shaping electoral polarization in the Pale than the tsarist repression we expected.

If we view political competition solely as redistributive, we assume that voters who prefer this adhere to a particular political ideology. However, if political competition includes two dimensions, a social and economic one, the relationship between income and political orientation may become distorted. This means that some poor voters take a right-wing stance on social issues and some wealthy voters take a left-wing stance. This leads to problems when examining convergent or divergent voting behavior as electoral polarization alone is insufficient to locate the ideological Center of Gravity (COG) on the economic dimension, as Finseraas (2010, p. 284) notes. To determine the COG, we evaluate parties' positions by weighting their vote shares and averaging their positions on a given dimension, using both our own coding and the Arzamas project. The COG index is a standardized measure that ranges from -6 to 6, with a left-to-right orientation according to the Arzamas framework. A value around zero indicates a more centrist voting behavior, while extreme values at either end indicate radicalization toward the political fringes (Gross and Sigelman 1984; Rohlfing and Schafföner 2019, p. 3). Serious tsarist crimes that posed a threat to both the elite and the general population were likely to move the COG to the right. As a result, working-class voters who favor

culturally authoritarian preferences might opt for nationalist party lists or the far right to the detriment of left-wing parties (Przeworski and Sprague 1986; Finseraas 2010, p. 302).

Table 2.5 contains fascinating results on the impact of tsarist repression on voting behavior in European Russia. The analysis of general repression (Okhrana) in columns 1-3 shows a leftward shift in the electorate in the districts most affected. However, in districts with greater monitoring of propaganda offenses, a "moral polarization" emerges that drives voters to the right, as evidenced by a rightward shift in the center of gravity (COG). This trend benefits right-wing parties, which differentiate themselves from the left by emphasizing non-economic issues. Conversely, the proliferation of propaganda leads voters to adopt more left-wing authoritarian attitudes. Interestingly, the effect of tsarist repression is reversed in districts with higher rates of violent assassinations, where elites are most overtly threatened. Here, left-wing parties and workers' associations may have been more committed to redistribution, leading to a shift of the electorate to the left. Moreover, districts with greater redistributive pressures tend to move to the left, likely as an attempt to prevent further violence. Column 6 of the Table 2.5 focuses on the Pale of Settlement, a historically more Europeanized and densely populated area, such that clandestine activities would cluster more. Although we expected that tsarist repression would have a greater impact in these districts, a rightward shift in COG is observed, although this is not statistically significant. In summary, the results do not support the assumption that political engagement and education among disadvantaged youth would strengthen the relationship between party polarization and civic polarization. Overall, our results suggest differential effects on voting behavior in European Russia, with different shifts across districts depending on the severity of local radicalization, such as in the monitoring of propaganda offenses, the number of violent killings, and redistributive pressures.

Our preliminary findings suggest that in a post-imperial nation, a changing political environment can lead to a reconfiguration of social classes in elections (Oesch and Rennwald 2018). In a two-dimensional (left-right) electoral contest, the lower classes do not necessarily vote for the left. As a result, the realignment of social classes in elections has reshuffled the electorate of political parties, especially those that take a non-economic/authoritarian approach (Spies 2013; Häusermann and Kriesi 2015; Oesch and Rennwald 2018). The basic assumption underlying this phenomenon is that political parties shape social policy based on their ideological profile and the material interests of their core constituency (Hibbs 1977; M. G. Schmidt 1996). As a result, many citizens may hold left-wing views on economic policy while adopting right-wing, nationalist, and authoritarian positions on cultural issues. In Table 2.6 (and Table B.3.19 in the Appendix), we present the effects of Okhrana repression on the political attitudes of voters in European Russia and the Pale. We measure the response to local radicalization by analyzing the percentage of the vote that political groups received in 1917 Constituency Assembly elections. To obtain this, we classified the parties as far/moderate left, far/moderate right, or center based on their economic policies and political orientation using the Arzamas and our own coding. Specifically, we classified the Social Revolutionaries and the Bolsheviks as far-left, while the Liberals and the Kadets were considered far-right. All parties within each ideological group were treated equally. In addition, centrist parties were defined as those that consistently held centrist positions over time and did not associate with either left-wing or right-wing parties.

Based on our analysis, we find that the Okhrana indicator moderates radicalization toward the moderate right in European Russia, including Jewish lists and other religious groups, as shown in Table 2.6. Moreover, we find that the gender of revolutionaries plays a role in increasing support for the moderate right, providing further support for a cognitive barrier that prevents the public from associating radicalism with the female gender. In addition, our research shows that the severity of the offense and the extent of non-economic party competition are important factors influencing voters' political preferences. In particular, propaganda offenses increase support for the far right, while membership in anticarist organizations shifts the political spectrum toward the center, as voters expect right-wing parties to focus on security issues. Remarkably, we also find that the most serious crime category, assassinations, boosts support for the extreme and moderate left. Our research also looks at the Pale of Settlement, as shown in Table B.3.19. We find high mobilization potential on redistributive issues, with membership increasing electoral support for centrist parties at the expense of both fringes. Conversely, propaganda offenses lead to a loss at the center and a strengthening at the margins, indicating a high mobilization potential on non-redistributive issues for these non-violent offenses.

In mid-November 1917, the Bolsheviks came to the realization that the formation of a majority coalition was not possible, even though they received almost a quarter of the votes. As a result, they abandoned formal democracy and opted for a revolutionary dictatorship, whose significance for Russian economic history remains controversial to

Table 2.5.: Center of Gravity in European Russia and the Pale

	European Russia			Pale of Settlement		
	(1)	(2)	(3)	(4)	(5)	(6)
Okhrana	0.047	−0.142	−0.216*	0.597**	−0.014	0.171
	(0.140)	(0.126)	(0.119)	(0.246)	(0.595)	(0.759)
Male revolutionaries	−0.110	0.138	0.288	−1.081***	0.005	0.121
	(0.204)	(0.189)	(0.179)	(0.306)	(0.872)	(1.034)
Propaganda	0.884**	1.586***	0.902*	−1.490	−0.569	0.540
	(0.356)	(0.469)	(0.459)	(0.947)	(1.771)	(2.122)
Membership	0.721*	0.407	0.525	4.305***	0.820	0.317
	(0.418)	(0.485)	(0.471)	(1.049)	(1.257)	(1.298)
Riots	−1.658*	−2.571**	0.109	6.927***	3.575	−1.775
	(1.003)	(1.176)	(1.213)	(1.959)	(5.826)	(7.848)
Assassinations	−0.631*	−0.603**	−0.844***	−1.098	0.118	−1.428
	(0.339)	(0.299)	(0.283)	(0.819)	(0.983)	(1.141)
Constituency FE	−0.015***	−0.009*	−0.006	−0.008	0.016	0.056
	(0.005)	(0.005)	(0.005)	(0.008)	(0.030)	(0.034)
Demographics	—	✓	✓	—	✓	✓
Geographics	—	—	✓	—	✓	✓
Middlemen	—	—	—	—	—	✓
F-Statistics	3.976	16.572	17.037	5.644	6.741	5.802
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000
Imputations	20	20	20	20	20	20
Observations	384	330	330	111	82	75

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The COG (Center of Gravity) variable used in this study represents the ideological center of gravity within a district, and is calculated as the average weighted mean left-right position of political parties based on their vote share, as proposed by Gross and Sigelman (1984) and utilized in the Manifesto project. The demographic controls came from two sources: Buggle and Nafziger (2021) and G. Kessler and Markevich (2017) and include district location factors, such as latitude, longitude, distance to the coastline, and global distance to the provincial capital and St. Petersburg. Other factors are the length of the growing season, presence of coal territories, and type of soil. Additionally, we account for the proportion of individuals with secondary and tertiary education, the proportion of Slavs and Jews by language, and the proportion of workers in industrial and agricultural sectors. These factors are measured based on the 1897 population levels and weighted by district population levels. We further include the share of serfs in 1858 as a control for each district. Moreover, middlemen controls from Grosfeld, Sakalli, et al. (2020) reflect the Jewish minority's integration into the countryside, including the proportion of Jews among craftsmen, creditors, transport, and grain trade. These controls were obtained by collapsing a grid-level dataset.

this day. Our research challenges the assumption that party polarization causes citizen polarization or radicalization in the context of redistributive pressures and elite preservation. Instead, political parties in the 1917 Assembly may have been influenced by the authoritarian institutional climate created by the Russian secret police. Our results suggest that, depending on the severity and visibility of revolutionary activities under Okhrana surveillance, a mobilizing effect was exerted on the political split between right-wing and left-wing parties. For the far-right parties, the Okhrana was an important ally, supporting the monarchy while rejecting communism and the redistribution of wealth. On the other hand, for the extreme left, the Okhrana was a unique opponent that provoked reactive and violent reactions. The results raise the question of the comparability of the different ideologies in the assembly.

According to Williams et al. (2016), parties with similar ideologies may be influenced by the policy outcomes of other parties with similar ideologies, resulting in a loss or gain of voter support. Thus, we argue that left- and right-wing parties may lose votes after left-wing terrorist attacks due to the contagion effects of tsarist exclusionary policies, even if they are not blamed for them. In such cases, differences between parties on social policy might become less important than overt conflicts over the size of the welfare state, with right-wing governments reducing the generosity of welfare programs only when the degree of polarization is high, as suggested by Finseraas and Vernby (2011). To examine the relationship between tsarist repression, ethnic self-assertion, and political mobilization during

Table 2.6.: Benefactors of Okhrana repression in European Russia, by faction

	Voting groups				
	(1) Far Left	(2) Moderate Left	(3) Center	(4) Moderate Right	(5) Far Right
Okhrana	0.034	−0.003	0.001	−0.031**	−0.001
	(0.022)	(0.011)	(0.030)	(0.013)	(0.005)
Male revolutionaries	−0.022	0.007	−0.052	0.056***	0.011
	(0.033)	(0.016)	(0.044)	(0.019)	(0.008)
Propaganda	0.032	−0.043	−0.115	0.060	0.066***
	(0.085)	(0.042)	(0.114)	(0.049)	(0.020)
Membership	−0.245***	−0.119***	0.571***	−0.117**	−0.091***
	(0.090)	(0.044)	(0.120)	(0.052)	(0.021)
Riots	0.361	0.281**	−1.193***	0.385***	0.167***
	(0.225)	(0.111)	(0.300)	(0.130)	(0.052)
Assassinations	0.100*	0.075***	−0.172**	−0.011	0.008
	(0.053)	(0.026)	(0.071)	(0.031)	(0.012)
Constituency FE	0.004***	−0.001**	−0.002	−0.001**	0.000
	(0.001)	(0.000)	(0.001)	(0.001)	(0.000)
Demographics	✓	✓	✓	✓	✓
Geographics	✓	✓	✓	✓	✓
F-Statistics	19.675	6.870	8.558	16.978	11.729
Prob > F	0.000	0.000	0.000	0.000	0.000
Imputations	20	20	20	20	20
Observations	313	313	313	313	313

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The dependent variables were categorized into five political party groups using the Arzamas method and the researchers' own coding. The groups were based on cumulative vote shares and included far-left (right), moderate left (right), center, moderate right, and far-right. The far-left comprised Social Revolutionaries and Bolsheviks, moderate-left included Peasant and Cooperative parties, the center included Mensheviks, Social Revolutionaries, and other socialists, moderate-right included Orthodox, Muslim, Jewish, and minority parties, and the far-right included Commercial industrialists, landowners (referred to as Liberals), and the Kadets. The demographic controls came from two sources: Buggle and Nafziger (2021) and G. Kessler and Markevich (2017) and include district location factors, such as latitude, longitude, distance to the coastline, and global distance to the provincial capital and St. Petersburg. Other factors are the length of the growing season, presence of coal territories, and type of soil. Additionally, we account for the proportion of individuals with secondary and tertiary education, the proportion of Slavs and Jews by language, and the proportion of workers in industrial and agricultural sectors. These factors are measured based on the 1897 population levels and weighted by district population levels. We further include the share of serfs in 1858 as a control for each district.

the 1917 Constituent Assembly, we present our final set of regressions in Table 2.7 (and Table B.3.18 in the Appendix for the districts of the Pale). Because party platforms tend to be oriented toward the economic dimension, we also consider a cultural dimension by analyzing vote shares for Jewish lists, which we believe can capture the impact of the experience of violence on political mobilization, as suggested by recent social science research (Bellows and Miguel 2009; Blattman 2009). Our analysis focuses on party mobilization, and thus we include ten Jewish lists in this variable, namely the Jewish List, the Jewish National Bloc, the Jewish National Election Committee, the Jewish National Lists, the Jewish Social Activists, the Folskpartei, Poalei Zion, the Zionists, Fareynikte, and the BUND.

According to our estimates in Table 2.7, the Mensheviks benefited most from the general tsarist repression, followed by the Jewish Lists and the Liberals. However, the extent of local radicalization, as measured by the severity of crimes, played an important role in bolstering support for the Kadets. The Kadets' share of the vote was significantly boosted by riots and the spread of anti-tsarist propaganda, while the Mensheviks suffered a 2.5-fold loss of votes due to riots. Thus, political radicalization affected the electoral success of most individual parties, including the Mensheviks (negative effect), the Socialist Revolutionaries (positive effect for membership only), the Liberals (positive effect for membership, but to a small extent), and the Kadets (positive effect for propaganda, riots, and assassinations,

Table 2.7.: Benefactors of Okhrana repression in European Russia, by individual parties

	Vote shares					
	(1) Mensheviks	(2) SRevol	(3) Bolsheviks	(4) Jewish lists	(5) Liberals	(6) Kadets
Okhrana	0.025*	−0.007	0.021	−0.007*	−0.007***	0.005
	(0.013)	(0.027)	(0.019)	(0.004)	(0.002)	(0.005)
Male revolutionaries	−0.033*	−0.020	−0.024	0.014**	0.009***	0.002
	(0.020)	(0.041)	(0.028)	(0.006)	(0.003)	(0.007)
Propaganda	0.024	−0.113	0.012	0.019	0.008	0.058***
	(0.051)	(0.105)	(0.072)	(0.015)	(0.007)	(0.019)
Membership	0.077	0.245**	−0.003	−0.020	0.017**	−0.108***
	(0.054)	(0.111)	(0.076)	(0.016)	(0.007)	(0.020)
Riots	−0.405***	−0.158	−0.283	0.036	−0.006	0.173***
	(0.136)	(0.278)	(0.191)	(0.040)	(0.018)	(0.049)
Assassinations	−0.023	−0.074	0.027	−0.008	−0.020***	0.027**
	(0.032)	(0.066)	(0.045)	(0.010)	(0.004)	(0.012)
Constituency FE	−0.001*	−0.000	0.004***	0.000	0.000**	−0.000
	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
Demographics	✓	✓	✓	✓	✓	✓
Geographics	✓	✓	✓	✓	✓	✓
F-Statistics	9.169	11.393	27.494	16.721	8.357	13.939
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000
Imputations	20	20	20	20	20	20
Observations	313	313	313	313	313	313

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The dependent variables refer to different political factions. Mensheviks encompasses the vote share for the center, leftist, and rightist factions of the Menshevik party. SRevol represents the vote share for the Social Revolutionaries, while Bolsheviks refers to any list where the Bolsheviks were the leading party. Jewish lists refers to the vote share for Jewish lists, such as Fareynikte, the Bund, or the Zionists. Liberals denotes the vote share for the Commercial Industrialists and Landowners, and Kadets represents the vote share for the most rightist party electable in the 1917 assembly. The demographic controls came from two sources: Buggle and Nafziger (2021) and G. Kessler and Markevich (2017) and include district location factors, such as latitude, longitude, distance to the coastline, and global distance to the provincial capital and St. Petersburg. Other factors are the length of the growing season, presence of coal territories, and type of soil. Additionally, we account for the proportion of individuals with secondary and tertiary education, the proportion of Slavs and Jews by language, and the proportion of workers in industrial and agricultural sectors. These factors are measured based on the 1897 population levels and weighted by district population levels. We further include the share of serfs in 1858 as a control for each district.

but negative effect for membership). Political mobilization for the Constituent Assembly could be related to previous experience with political grievances, regardless of political orientation. This effect applied not only to those directly affected by violence, but also to those who had witnessed or heard about violence and mobilized as a result. Our findings are therefore consistent with previous research indicating that terrorist attacks can influence the voting direction, with increasing support for right-leaning parties advocating "hawkish" policies as they are perceived as more competent in dealing with left-wing terrorism (Getmansky and Zeitzoff 2014; Berrebi and Klor 2008). These "directional effects" of terrorist attacks are particularly relevant for voting for or against right-wing parties suspected of continuing tsarist (anti-Semitic) policies after the election. While theories of retrospective voting and political accountability suggest punishment of tsarist parties after attacks, citizens may also support such parties to oppose terrorists and "rally around the flag" (Chowanietz 2010). Our main effects show that different degrees of radicalization in a district significantly increased turnout for the Kadets and the Social Revolutionaries, but interestingly not for the Bolsheviks. A similar pattern holds for the liberal parties, which benefited from tsarist repression but to a lesser extent than the left-leaning parties. This result sheds light on the dynamics of political mobilization in the context of historical repression and may have implications for contemporary politics.

In summary, our research shows that the Okhrana had a significant impact on the electoral behavior of right-wing parties in European Russia by maintaining public order. When public security or the elite was more openly threatened, we found a remarkable increase in relative and overall radicalization, median party status, and votes for individual parties on the right (as shown in Table 2.7). Our results further suggest that Okhrana's anti-revolutionary efforts had a positive effect on reducing relative radicalization toward the most left-leaning party on the left-right political spectrum, controlling for geographic and demographic variables (as in Table 2.6). However, this effect was not observed in the Pale. Moreover, the Okhrana had a more significant positive effect on the mean party status of Mensheviks in districts with a higher number of assassinations than among Kadets and on Jewish lists in districts where propaganda crimes were more common (as shown in Table B.3.16).

Moreover, our analysis suggests that the political preferences of left- and right-wing voters vary less in the Pale than in European Russia, which may explain the lack of clear evidence of an impact of Okhrana repression on individual party votes, overall and relative radicalization, and median party status within the Pale (as shown in Table B.3.18). Apart from the macroeconomic factors related to the war mentioned earlier, there are two possible interpretations for this result. First, it is possible that the level of radicalization or repression by the Okhrana in the Pale is not significantly different from that outside the Pale, leading to similar political outcomes. On the other hand, it may be that institutional repression by the Okhrana was not sufficient to alter existing socioeconomic hierarchies and ethnic identities in the Pale, resulting in no significant changes in political preferences. This finding sheds light on the extent of state-sponsored anti-Semitism beyond the Pale and offers a promising direction for further research.

2.5.2. Spatial Correction

To substantiate our OLS results, we used the Stata command `acreg` to run correlation regressions that account for complex correlation structures between units (Colella et al. 2020). This approach not only strengthens the inference process, but is particularly useful for spatial data such as ours that have observations with geographic locations or neighborhood structures. To account for spatial correlation, we set a cutoff of 60 km and 100 km because we expect correlation to decrease beyond a certain distance.

Our results support the findings of the OLS analysis and show that the visibility and severity of crimes had an impact on the electoral success of the Liberal Party. More importantly, however, the Kadet Party experienced an even greater increase in electoral success, particularly in response to propaganda crimes, riots, and assassinations. As shown in B.3.20 to B.3.21, this effect was statistically significant at the 1% level. We can further confirm our OLS results and show that increasing radicalization, as measured by Okhrana's activities, had two primary effects. First, it increased voter polarization in response to the riots. Second, it led to greater voter radicalization toward far-left and far-right parties, with the latter gaining a disproportionate share of the vote, including a combination of Liberals and Kadets. In contrast, the center emerges as the biggest loser, as shown in Tables B.3.22 to B.3.23. Moreover, our analysis in Table B.3.24 shows a widening of the political spectrum in response to assassinations and, more importantly, in response to riots at both distance boundaries. In these districts, far-right party positions registered the largest gains in response to Okhrana repression and the radicalization of society, indicating an increasing inequality and discontent, while far-right party positions indicate a desire to maintain public order. It is noteworthy that despite their electoral gains, the Kadets did not emerge as the median party in the study of the seriousness of crimes. Instead, it was the Jewish lists and national parties that emerged victorious from assassination and propaganda crimes, as shown in Tables B.3.25 to B.3.26. Although it is challenging to attribute the victory of the Jewish lists to a single factor, it is worth noting that the Jewish lists had a well-organized political presence in urban areas and represented a significant portion of the Jewish population in the Russian Empire. Their program, which emphasized Jewish autonomy and equality, may have resonated with Jewish voters who had experienced discrimination and oppression. Moreover, the timing of the elections, which coincided with a period of political unrest and social imbalance, may have provided an opportunity for previously marginalized groups to mobilize and assert their political power. Our findings suggest that the Okhrana's investigative activities had a more complex impact on the political landscape than previously thought, as they not only aimed to suppress leftist parties, but also helped shape the political center toward moderate to rightist parties. Our analysis, which also incorporates spatial data, therefore contributes to a better understanding of the mechanisms through which Okhrana activities influenced electoral behavior.

To increase the reliability of our analysis even further, we used a spatial econometric model following Kelly (2019). This model is superior to the traditional linear regression model because it integrates spatial lags of the dependent

variable, explanatory variables, error term, or a combination of these components (Yesilyurt and Elhorst 2017; LeSage and Pace 2009; Elhorst 2014). To assess spatial autocorrelation, we utilized three spatial lag models. The first model we used was an endogenous spatial lag model, also known as a spatial autoregressive (SAR) model. This model aimed to investigate whether the political climate in one district was influenced by the political climate in other districts. In the second model, we employed exogenous spatial lags in a Spatial Lag of X (SLX) model to measure how radicalization in neighboring districts impacted a given district. These models allowed for a more accurate estimation of the spillover effects between variables through their direct effects. Lastly, we applied the General Nesting Spatial Model (GNS) which includes all spatial lags, including a spatial error lag, to detect spatial non-stationarity in the model.[17]

The results presented in Tables B.3.28 – B.3.30 confirm that our measures of local radicalization significantly affected the success of individual political parties, particularly the Kadets, in response to riots, assassinations, and propaganda. We also observed a strong spatial dependence of the explanatory variable, suggesting that revolutionary activities spread across districts. In addition, our research confirms a direct relationship between the severity of crimes and increased voter polarization. In particular, rioting has been shown to be particularly influential in promoting radicalization at both the far-right and far-left ends of the political spectrum, often at the expense of more moderate views of the center, as shown in the Tables B.3.32 – B.3.34.[18] In addition, our study shows that Okhrana had a positive effect on the left-right axis of the political spectrum, resulting in an increase in the left-right spectrum and a shift to the right with respect to the least visible crime categories, as shown in Table B.3.36. Finally, we provide convincing evidence of the negative impact of the anti-revolutionary activities of the Russian secret police on the median party status of the Mensheviks, Social Revolutionaries, Jewish Lists, and Liberals, as in Tables B.3.38 – B.3.39. Importantly, the direct effect of Okhrana repression and its severity/visibility are consistent with OLS estimates in all our models. In summary, our results suggest that Okhrana repression and local radicalization successfully increased electoral polarization and drove voter support to the right side of the political spectrum rather than to the left.

2.5.3. Matching

To mitigate potential bias in observational studies, we used propensity score matching (PSM) to group individuals or groups with similar propensity scores based on observable characteristics that may influence treatment assignment. We used two PSM methods, kernel-based (KBM, Panel A) and nearest-neighbor matching (NNM, Panel B) in relation to our general repression indicator (Okhrana). Our results in Panel A, presented in Table 2.8 in terms of the success of each party, suggest that local radicalization is significantly associated with a stronger preference for the Kadets, as measured by our overall Okhrana repression indicator. This result is statistically significant at the 1% level. Moreover, the loss for the Bolsheviks is about four times stronger than that on the Kadets, suggesting that the Bolsheviks disproportionately benefited from Okhrana repression as measured by our composite indicator. Our NNM algorithm in Panel B confirmed both the magnitude and statistical significance of these effects and also provided support for the Jewish lists. We implement the Rosenbaum Bounds test to examine possible effects of unobserved factors on the statistical significance of the average treatment effect (ATT).[19] Our results show that Γ, the measure of hidden bias, is not significant enough to affect the significance of the reported coefficients at an upper significance level of 0.1. In addition, we find evidence of a trend toward increased political radicalization toward the far-right end of the political spectrum, as shown in Table 2.9. This trend is consistent across both matching algorithms (NNM [Panel A] and KBM [Panel B]) and our Rosenbaum boundary test (Γ at 0.05).

Moreover, our results support the assumption that the implementation of Okhrana repression may be responsible for the increase in support for the far-right political groups. This suggests that the role of the Okhrana in suppressing left-wing mobilization within Russian society was crucial, as shown in Table 2.10. In addition, our research shows that Okhrana's anti-revolutionary activities played a significant role in shaping the media party position of the Socialist Revolutionaries and Mensheviks, as shown in Table B.3.41. In summary, our study provides valuable insights into

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[17] While the Spatial Error Model (SEM) integrates space into the error process, it is not commonly used in spatial econometric models. Some researchers have investigated the plausibility of the SEM model, but it is not a widely accepted approach (Yesilyurt and Elhorst 2017).

[18] Importantly, we observed similar direct effects when examining direct, indirect, and aggregate effects.

[19] We used the `rbounds` Stata module provided by Gangl (2004).

Table 2.8.: Average Treatment Effect (ATT) & Sensitivity Analysis: Individual parties

Variable	Mensheviks	SRevol	Bolsheviks	Jewish lists	Liberals	Kadets
	Panel A: Kernel-Based Matching					
	(1)	(2)	(3)	(4)	(5)	(6)
ATT − Okhrana	0.004	−0.100**	0.049	0.010*	0.000	0.020***
	(0.028)	(0.045)	(0.032)	(0.006)	(0.003)	(0.006)
Demographics	✓	✓	✓	✓	✓	✓
Geographics	✓	✓	✓	✓	✓	✓
Treated	164	164	164	164	164	164
Control	174	174	174	174	174	174
$\Gamma(sigm+ < 0.05)$	108	108	107	40	82	108
Observations	338	338	338	338	338	338
	Panel B: Neighrest-Neighbor Matching					
	(1)	(2)	(3)	(4)	(5)	(6)

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard error in parentheses. NNM $==1$. Common support is imposed. The dependent variables refer to different political factions. Mensheviks encompasses the vote share for the center, leftist, and rightist factions of the Menshevik party. SRevol represents the vote share for the Social Revolutionaries, while Bolsheviks refers to any list where the Bolsheviks were the leading party. Jewish lists refers to the vote share for Jewish lists, such as Fareynikte, the Bund, or the Zionists. Liberals denotes the vote share for the Commercial Industrialists and Landowners, and Kadets represents the vote share for the most rightist party electable in the 1917 assembly. The demographic controls came from two sources: Buggle and Nafziger (2021) and G. Kessler and Markevich (2017) and include district location factors, such as latitude, longitude, distance to the coastline, and global distance to the provincial capital and St. Petersburg. Other factors are the length of the growing season, presence of coal territories, and type of soil. Additionally, we account for the proportion of individuals with secondary and tertiary education, the proportion of Slavs and Jews by language, and the proportion of workers in industrial and agricultural sectors. These factors are measured based on the 1897 population levels and weighted by district population levels. We further include the share of serfs in 1858 as a control for each district.

the impact of the Okhrana's repressive measures on political preferences in Russia. It underscores the effectiveness of the Okhrana in suppressing leftist mobilization and exacerbating polarization of the electorate.

Finally, we use Coarsened Exact Matching (CEM) to examine the effects of general Okhrana repression or local radicalization on left-wing (Bolsheviks, Mensheviks) and right-wing (Liberals, Kadets) political parties, using a reduced set of covariates as shown in Table 2.11 and Table B.3.42. Our results suggest that regions that experience high levels of Okhrana oppression are more likely to support right-wing parties due to increasing left-wing radicalization in Russian society. In particular, we observe statistically significant effects on the moderate right and far-right electorates at the 10% and 1% levels, respectively. This trend is most evident in the highly statistically significant turnout for the Kadets. However, our results suggest that the Kadets do not outperform the Mensheviks in terms of individual party electoral success. Analyzing the average Okhrana treatment (ATT) effect for relative radicalization, we discover a statistically significant positive effect on preference for the farthest right party at the 1% level. Even when we use a richer proposition of covariates, the rightward effect of secret police surveillance remains evident. Our results show that Kadets are the main beneficiaries of Okhrana repression, as shown in the Tables B.3.27 and B.3.43. We observe a significant radicalization toward the far right, with a persistent preference for the farthest right political party in each district.

2.6. Conclusion

Russia's delayed response to an emerging political opposition, inaction in establishing a constitutional government, and failure to address political repression before World War I distinguished the country from other European nations (Daly 2002, p. 80). The sluggish response was due to a confluence of factors, including the famine of 1891-92, Nicholas II's inertia, and disregard for public suffering, which exacerbated growing popular discontent. The liberal opposition pushed for a constitution and parliament, while peasants were dissatisfied with agrarian reform and industrial workers began to mobilize. At the same time, the question of national identity in the peripheral regions of the Russian Empire became increasingly pressing: ethnic groups such as Poles, Ukrainians, Finns, peoples of

Table 2.9.: Average Treatment Effect (ATT) & Sensitivity Analysis: General radicalization

Variable	Most left position	Most right position	Left-right range
	Panel A: Kernel-Based Matching		
	(1)	(2)	(3)
ATT – Okhrana	0.016	0.141***	0.125
	(0.105)	(0.038)	(0.111)
Demographics	✓	✓	✓
Geographics	✓	✓	✓
Treated	164	164	164
Control	174	174	174
$\Gamma(sigm+ < 0.05)$	200	108	108
Observations	338	338	338
	Panel B: Neighrest-Neighbor Matching		
	(1)	(2)	(3)
ATT – Okhrana	0.010	0.118***	0.109
	(0.120)	(0.044)	(0.124)
Demographics	✓	✓	✓
Geographics	✓	✓	✓
Treated	164	164	164
Control	174	174	174
$\Gamma(sigm+ < 0.05)$	200	108	108
Observations	338	338	338

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard error in parentheses. NNM ==1. Common support is imposed. The dependent variables refer to the left-right position of the most leftist and most rightist parties at the 1917 Constituency Assembly election. In addition, the district-level political spectrum is measured by calculating the absolute distance between the weighted position of the most leftist and most rightist parties at the election, based on their vote share and also utilized in the Manifesto project. The demographic controls came from two sources: Buggle and Nafziger (2021) and G. Kessler and Markevich (2017) and include district location factors, such as latitude, longitude, distance to the coastline, and global distance to the provincial capital and St. Petersburg. Other factors are the length of the growing season, presence of coal territories, and type of soil. Additionally, we account for the proportion of individuals with secondary and tertiary education, the proportion of Slavs and Jews by language, and the proportion of workers in industrial and agricultural sectors. These factors are measured based on the 1897 population levels and weighted by district population levels. We further include the share of serfs in 1858 as a control for each district.

the Caucasus, and Jewish subjects took advantage of revolutionary unrest in the centers of the empire to demand self-determination (Hilbrenner et al. 2008). Against this tense backdrop, Russian elites feared being overwhelmed by modernizing forces, which led to the creation of modern political police forces throughout Europe. The Okhrana exemplified the adversarial and outdated relationship between the imperial administration and its citizens. The image of an unbeatable, omnipresent, and efficient army that was above the law and acted at the discretion of the administration reinforced this fear.

To examine the impact of Okhrana surveillance on Russian political development in the run-up to the 1917 Constituent Assembly, our study used a novel dataset on espionage in the Russian Empire. We analyzed individual party votes, polarization, overall and relative radicalization, and median party status to gain insights into how authoritarianism and radicalization influenced political preferences. The results of the Constituent Assembly are crucial for understanding public opinion after the fall of tsarism and its repressive measures in 1917. Our results show a clear positive correlation between the extent of local radicalization and political polarization in the last free elections before the rise of the Communist Party. The positive impact of Okhrana surveillance measures on overall and relative radicalization to the right illustrates the effectiveness of authoritarian states and the use of top-down repression as a key tool for the survival of authoritarian states. Moreover, our analysis of the election results has revealed a political system in its early stages in which cultural and economic inequalities were reinforced by the

Table 2.10.: Average Treatment Effect (ATT) & Sensitivity Analysis: Polarization and relative radicalization

Variable	PolIndex	Far Left	Mod. Left	Center	Mod. Right	Far Right
Panel A: Kernel-Based Matching						
	(1)	(2)	(3)	(4)	(5)	(6)
ATT – Okhrana	0.033	0.046	0.002	−0.085**	0.017	0.021***
	(0.030)	(0.034)	(0.006)	(0.036)	(0.012)	(0.006)
Demographics	✓	✓	✓	✓	✓	✓
Geographics	✓	✓	✓	✓	✓	✓
Treated	189	164	164	164	164	164
Control	180	174	174	174	174	174
$\Gamma(sigm+ < 0.05)$	124	108	76	108	83	108
Observations	369	338	338	338	338	338
Panel B: Neighrest-Neighbor Matching						
	(1)	(2)	(3)	(4)	(5)	(6)
ATT – Okhrana	0.037	0.056	0.002	−0.080*	0.003	0.019***
	(0.033)	(0.037)	(0.006)	(0.041)	(0.017)	(0.007)
Demographics	✓	✓	✓	✓	✓	✓
Geographics	✓	✓	✓	✓	✓	✓
Treated	189	164	164	164	164	164
Control	180	174	174	174	174	174
$\Gamma(sigm+ < 0.05)$	124	108	76	108	83	108
Observations	369	338	338	338	338	338

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard error in parentheses. NNM ==1. Common support is imposed. The dependent variables were categorized into five political party groups using the Arzamas method and the researchers' own coding. The groups were based on cumulative vote shares and included far-left (right), moderate left (right), center, moderate right, and far-right. The far-left comprised Social Revolutionaries and Bolsheviks, moderate-left included Peasant and Cooperative parties, the center included Mensheviks, Social Revolutionaries, and other socialists, moderate-right included Orthodox, Muslim, Jewish, and minority parties, and the far-right included Commercial industrialists, landowners (referred to as Liberals), and the Kadets. The demographic controls came from two sources: Buggle and Nafziger (2021) and G. Kessler and Markevich (2017) and include district location factors, such as latitude, longitude, distance to the coastline, and global distance to the provincial capital and St. Petersburg. Other factors are the length of the growing season, presence of coal territories, and type of soil. Additionally, we account for the proportion of individuals with secondary and tertiary education, the proportion of Slavs and Jews by language, and the proportion of workers in industrial and agricultural sectors. These factors are measured based on the 1897 population levels and weighted by district population levels. We further include the share of serfs in 1858 as a control for each district.

actions of the imperial Russian secret police. This strengthened the positions of certain parties on both the left and right ends of the political spectrum. Far-right parties benefited most in districts where elites were more openly threatened. However, the cultural dimension of the conflict between state and society, particularly in relation to the emancipation and mobilization of Jews, was also felt beyond the Pale of Settlement and in all European areas of the Russian Empire. Overall, our study sheds light on how Okhrana surveillance influenced political preferences in the years leading up to the Constituent Assembly of 1917, and offers valuable insights into this crucial period of nation-building. However, we can only speculate on what a noncommunist government would have looked like, and further research using comparative political economy and political behavior analysis is warranted (Häusermann, Picot, et al. 2013; Manow et al. 2018; Castañeda Dower, Markevich, et al. 2021).

Looking at the historical events that took place in Russia in the 19th and early 20th centuries, striking similarities can be seen with the late 1980s in Eastern Europe and the Soviet Union. Modernization during Alexander II's Great Reforms between 1861 and 1881 had the unintended effect of radicalizing educated youth and causing radical intellectuals to emerge. Non-Russian minorities rebelled, and revolutionaries attacked the tsar, leading to his assassination and the establishment and expansion of the Okhrana under his successors. Examining Alexander II's goals, strategies, and challenges could have predicted the obstacles Gorbachev would face decades later. The demise of the tsarist regime should therefore serve as a warning of the dangers of suddenly unleashing popular sentiment after years of autocratic repression, such as national mobilization and economic distress (Zubok 2021).

Table 2.11.: Coarsened matching results – reduced set of covariates

Variables	Coefficient	Number of Obs.	R-Squared
Individual Parties			
Mensheviks	0.029*	218	0.014
	(0.016)		
SRevol	−0.105***	218	0.044
	(0.033)		
Bolsheviks	−0.001	218	0.000
	(0.030)		
Jewish lists	0.013***	218	0.039
	(0.004)		
Liberals	−0.004**	218	0.019
	(0.002)		
Kadets	0.023***	218	0.068
	(0.006)		
General Radicalization			
Most left	−0.083	218	0.003
	(0.105)		
Most right	0.126***	218	0.051
	(0.037)		
Left-right range	0.209**	218	0.018
	(0.105)		
Relative Radicalization			
PolIndex	−0.004	244	0.000
	(0.019)		
Far Left	−0.001	218	0.000
	(0.030)		
Moderate Left	0.019*	218	0.016
	(0.010)		
Center	−0.061**	218	0.018
	(0.030)		
Moderate Right	0.025**	218	0.022
	(0.011)		
Far Right	0.018***	218	0.043
	(0.006)		
Median Party			
Mensheviks	0.036	244	0.009
	(0.024)		
SRevol.	0.050	244	0.006
	(0.043)		
Jewish lists	−0.219***	244	0.080
	(0.048)		

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses. Results for the Bolsheviks, Kadets and Liberals as median party in a given district are omitted. The Median Party status is dummy variable, coded as 1 if a party is a median party and 0 if not. The median party is calculated by ranking the party's votes and calculating the row median. A party is coded as a median party if its rank corresponds to the row median. Different parties with the same left-right position (e.g. alliances) are treated as one party with the cumulative vote share.

The Okhrana succeeded in suppressing revolutionary activity within the Russian Empire, but it could not prevent subversive networks from forming abroad (Fischer 1997). The organization's successes and failures illustrate the effectiveness of the tsarist bureaucracy. Although the Okhrana had only a few thousand employees in 1913 in a country of over 160 million people, it was able to maintain its power thanks to its centralized and specialized structure combined with highly effective methods (Lauchlan 2005, p. 48). The independence of the Okrana from the regular police and the wide-ranging powers it possessed made it a precursor and prototype for all political police

organizations of the twentieth century, through the agency of corresponding communist institutions (Pipes 1979, p. 302). Our analysis suggests that a strong security state can generate short-term political support. The Constituent Assembly, a democratic experiment between two authoritarian regimes, provides a unique opportunity for these observations. Future research on the economic history of tsarist Russia should focus primarily on the complex interplay between politics and economics and examine the economic and cultural goals of the various political parties. It is critical to address gaps in previous research, such as the lack of data on how authoritarianism affected social structures and community interactions and how these changes affected political outcomes. An integrated analysis of the historical role of political parties and their influence on demand-side economic and cultural issues could provide a more comprehensive understanding of the topic.

3 | The Engineering of Consent[*]

A Network Analysis of Belief Manipulation

Abstract

Network theory is used to examine East Germany's dual dictatorship past, which is seen as the cause of higher levels of ethnocentrism and xenophobia among contemporary East Germans compared to West Germans. Within an intergenerational DeGroot framework, interactions between dynasties embedded in a network of social interactions are examined. A network cannot be abandoned by its dynasties, nor can it accept new members. All dynasties interact with each other and update their information based on a rule. The actions of dynasties indirectly affect each other's descendants through spillover effects in incentives and through strategic externalities arising from hidden beliefs. A central planner can intervene to change individuals' incentives through central schooling and upward mobility. The goal is to understand how the planner can intervene specifically in the presence of these dynasties and their constraints. This helps explain how a regime stabilizes itself and how it reaches homogeneity among its citizens.

JEL Classification: H11, N33, N43, P20, P26, P37, P48, P51

3.1. The Inner Orient

Researchers often develop a "legacy"-type argument with three components to account for the enduring effects of autocratic institutions or political violence. These components are an outcome that cannot be fully explained by contemporary causes, a cause or correlate that existed before the outcome, and potential links between antecedent states and the outcome (Wittenberg 2015, p. 367). The communist legacy has been extensively studied for its visible effects on political participation, preferences, interethnic relations, economic activity and growth, and public health. The division and reunification of Germany offer a unique and quasi-experimental situation, which has captured the attention of many social scientists. After World War II, two regions of the same country were assigned to two opposing political regimes. The western zones, comprising the American, British, and French territories, formed the Federal Republic of Germany and unified their economies and politics. The Soviet Occupation Zone (SBZ) became the socialist German Democratic Republic (GDR), with close relations with the Soviet Union and other Warsaw Pact members.[1] The swift reunification of Germany was triggered by the opening of the inner-German border in November 1989, which led to economic integration in July 1990 and political integration in October 1990, ultimately reuniting the two parts under the same political system (Bursztyn and Cantoni 2014, p. 27).

Given the striking differences between the political and economic systems in West and East Germany, much of the literature has argued that the communist experiment had a lasting impact on the population in the East. In an attempt to gauge the strength of this disastrous GDR legacy and its significance for the new German economy, the state of mind of East Germans has been examined as regularly as it has been extensively; usually as a divergence from Western characteristics and beliefs (Bisky 2005, p. 105). The GDR dictatorship is credited with having had a lasting negative impact on economic behaviors such as consumer profiles, political preferences, and trust in the state. The communist system influenced gender roles, with studies showing higher labor force participation among East German women (Campa and Serafinelli 2019; Zoch 2021; Lippmann et al. 2020). East Germans have a higher tendency for conspicuous consumption to compensate for their "deficit syndrome" as investigated in Friehe and Mechtel (2014) and Maaz (2017). Despite the knowledge of economic prosperity in the West, East Germans remain

[1] West Berlin was a Western exclave, surrounded by the territory of the GDR and separated by the Berlin Wall.

skeptical of markets, as they have not seen significant improvements in the living conditions of the poorest members of society after reunification and market liberalization (Corneo and Grüner 2002; Alesina and Fuchs-Schündeln 2007). Moreover, East Germans' inflation expectations are higher, leading to higher consumer debt and lower bond ownership (Laudenbach et al. 2020). In addition, the surveillance apparatus of the Stasi is blamed for the erosion of social capital, particularly a persistent lack of trust in members outside the immediate family environment (Jacob and Tyrell 2010; Lichter et al. 2021). Finally, comparative analyses have further shown that East Germans exhibit significantly more xenophobic and anti-Semitic attitudes than West Germans. Especially the younger generation of East Germans shows a stronger preference for authoritarianism. According to a 2016 study by the Leipzig Center, East Germans born in 1986 and later consistently express more far-right views (23.7%) than their West German peers (13.7%) (Decker 2016, p. 39). About half of them favor harsher punitive measures against "outsiders" or "troublemakers" (Zick et al. 2015, p. 68).

Part of the available evidence strongly suggests that living under an authoritarian regime for four decades might have profoundly shaped the attitudes and beliefs of the East German society. But, despite the widespread (and in part questionable) tendency to attribute any result of postcommunism to a "communist legacy," questions remain about why certain institutions persist, how long it takes to eliminate them, and why they were created in the first place (Cheremukhin et al. 2013). This gap in our understanding of how communist institutions work, has resulted in most research – such as that cited above – being empirical in nature. Moreover, many of the prominent studies do not adequately distinguish between persistence mechanisms (direct effects through trauma etc.) and secondary transmission mechanisms (through family, community, institutionalization, and evolution etc.). While this approach may be appropriate for some purposes, it has hindered the development of new theoretical frameworks needed to explore the impact of individual experiences of authoritarian violence at community and national levels (Walden and Zhukov 2020). The issue at hand concerns the use of coercion as a means to achieve both political and economic objectives. Unfortunately, our understanding of the precise objectives, strategies, and outcomes associated with this approach remains significantly constrained. Specifically, it is unclear whether the use of repression has a positive or negative effect on a regime's ability to realize its goals. Furthermore, we still do not fully understand the interplay between propaganda and censorship in post-war dictatorships, particularly whether these tools were used in tandem or separately depending on the regime's goals and context (Zhuravskaya et al. 2021, p. 73).

With this study, I aim to fill a gap in the existing literature by presenting a model that captures the transition between two regimes with opposing ideologies. I focus specifically on a unique episode in East German history, marked by its double dictatorship imprint involving the transition from fascism to state-imposed "anti-fascism." During this period, a small communist elite, composed primarily of former Nazi prisoners and exiles, had the challenging task of leading the SBZ and later the GDR in the face of large numbers of former Hitler sympathizers. They had to skillfully balance competing interests to create the first workers' and peasants' state. To gain a better understanding of this process, I examine the role of opinion manipulation and coercion within a social network under this new dictatorship, focusing on both horizontal and vertical socialization efforts. The model will provide valuable insights into the persistence of marginalizing cultural and ideological elements, despite efforts to eliminate them.

To understand how political institutions function and persist over time, the model emphasizes the importance of elite formation, known as a guiding culture or "Leitkultur", which influences future generations by passing on role models to the young, as well as a trickle-down process in which families and communities discuss and remember their experiences. In particular, the model highlights social connections as a key factor in the emergence, development, and persistence of cultural traits, thereby emphasizing on the time required to reach a steady state. I use an overlapping DeGroot model, linking prior beliefs and updated opinions through the structural features of the social network (DeGroot 1974). Families, called dynasties, are embedded in this network of social interaction that cannot be abandoned or accept new members. Interactions among dynasties are continuous and they update their beliefs based on a simple rule of thumb as highlighted in Gigerenzer and Kober (2007). Dynasties influence each other indirectly through spillover effects on incentives and strategic externalities arising from hidden beliefs. A socialist planner is introduced to change individuals' incentives by implementing a centralized school system and social advancement mechanisms that reduce the extent of imperfect empathy among parents. By further dividing the social network into influence classes, I model a political socialist elite that serves as a guiding culture to influence political loyalties in the rest of the society. It follows that dynasties socialized in the old order are not only influenced by the new guiding culture, but also influence it themselves to some degree. As a result of this process, a social structure emerges

that is characterized by a high degree of uniformity in terms of nationalist and chauvinist political traits and by perpetuating class characteristics.

This model aims to explain the persistence of traits in politically segregated societies where members observe each other's actions but initially hold opposing opinions, based on their location in the network structure. It emphasizes the significance of influential opinion makers who have the ability to sway others in the network, resulting in different subsets of society sharing similar characteristics. The model also delves into the role of centralized school systems and incentives for social mobility and how they shape beliefs and influence vertical socialization. Overall, the model offers a comprehensive analysis of the complex interplay between network structure, opinions, and belief manipulation in shaping social dynamics (Golub and Sadler 2016, p. 14). It helps to explain the emergence of a distinct East German identity in the late 1980s, that persists qua GDR-socialized parental generation (Kollmorgen 2005, p. 162).

My analysis makes several contributions to the existing literature. First, I advance the study of the micro-mechanisms of culture and its persistence, particularly in cases where political institutions are designed to directly influence the dynamics of opinion. In doing so, I contribute to our understanding of the interplay between propaganda and censorship in postwar dictatorships when they are used in tandem to promote regime legitimacy. While previous work has focused on the enforcement of preferred behaviors by emergent leaders, this analysis delves into the critical role that individuals' ability to decouple preferences and behavior plays in this process. This is consistent with the arguments of Hoff and Sen (2005) and Akerlof (1976), which suggest that self-interested individuals may adhere to a social system that is harmful to them. Second, my analysis focuses on the interactions between the institutional environment and socialization decisions, expanding the literature on decision making between individuals and different cultures in the context of a first and second generation of "regime migrants." My research focuses on social mobility, where conformist behavior is necessary for advancement and is influenced by official indoctrination through a centralized school system that also influences parents' socialization decisions. This raises questions about the effectiveness of schools as instruments of surveillance, the effects of rewards and punishments, and the link between private and public choices. More generally, my research raises considerations about the durability of political legitimacy and how transitions can be impeded. Finally, the proposed model has important implications for policymaking, as it might help explain Gorodnichenko and Roland (2020)'s findings according to which collectivist cultures, in contrast to individualist cultures, are more reluctant to rebel against a "good" autocrat who provides strong economic development.

The paper is structured as follows: In Section 3.2, the paper lays out the historical context of the post-war transition from fascism to anti-fascism in Germany as a foundation for the subsequent analysis. Section 3.3 describes the model used in the study, which explores individual and collective decision-making processes, institutional environments, and socialization mechanisms' impact on people's beliefs and actions. This section also highlights how these factors interact with each other. Section 3.4 provides a historical account of the skinhead scene, treatment of foreigners, and prevalent anti-Semitism during the late GDR to demonstrate the model's applicability. In the final sections, Section 3.5 summarizes the key findings and their contributions to the literature on culture and political persistence. Section 3.6 discusses the model's significance in understanding political decision-making processes and the East German transition to democracy in a unified Germany, as well as its limitations.

3.2. Historical background I – The early GDR

To fully cover the extensive historical timeframe examined in this project, it is essential to define "fascism" and "anti-fascism" within the context of the GDR to ensure accurate differentiation. By equating "fascism" solely with right-wing extremism, one may assume that the rise in such attacks during the early 1990s was solely due to incorrigible old Nazis.[2] However, this perspective fails to acknowledge the emergence of a more youthful and modernized form of right-wing extremism originating from the skinhead subculture during the 1980s, as will be further explained. Consequently, referring only to old Nazis inaccurately portrays the development of anti-Semitic and xenophobic attitudes in East Germany (Neubacher 1994, p. 17). Within Marxist-Leninist theory, "fascism" and the term "neo-fascism" had a polemical and denunciatory purpose. As per the 1935 Declaration of the Third

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[2] In September 1991, asylum seekers were attacked in their home in Hoyerswerda. Similarly, asylum seekers were attacked in pogrom-like riots in Rostock-Lichtenhagen in August 1992 for several consecutive days. Many who witnessed the violence not only tolerated it, but supported it by applauding it. Examples in West Germany include lethal fire assaults against Turkish foreigners in Mölln (November 1992) and Solingen (May 1993) (Falk et al. 2011, footnote 1 &15).

World Congress of the Communist International, fascism represented "the openly terrorist dictatorship of the most reactionary, chauvinist, imperialist elements of finance capital" (Pieck et al. 1957, p. 87). Its roots were attributed exclusively to class antagonisms and crisis scenarios, in which the owning classes utilized a fascist movement to enforce their economic interests (Kühnl 1971, p. 248). This narrow and deterministic interpretation of fascism in communist states aimed to expose capitalist-structured democracies or the "West" as inherently "fascist."

3.2.1. Ideology

Citizens' preferences and beliefs are shaped by their past experiences, which means that political systems seldom evolve due to external factors (Fuchs-Schündeln and Schündeln 2015). However, in the case of communist regimes in Eastern Europe, power-political considerations played a large role in their emergence, rather than the economic or political preferences of citizens (Pop-Eleches and Tucker 2017, p. 42). This is evident in the voluntaristic attitude of many Eastern European satellite states toward fascism, which was strongly influenced by power relations and the presence of Soviet boots on the ground, as confirmed in the agreements of the Yalta Conference of 1945.[3] Consequently, in the SBZ, the Soviet Military Administration (SMAD) quickly implemented measures to eradicate fascist elements and other provisions of the Potsdam Agreement, such as purging personnel in government, academia, and business, changing property relations through expropriation and land reform, and sentencing war criminals and criminals against humanity (Neubacher 1994, p. 18).[4]

Although the GDR was deemed successful in eliminating fascism and averting the emergence of right-wing extremism, the leadership and population retained persistent mentalities and personal continuities associated with the previous regime. This was due to the fact that many high-ranking Nazi officials held crucial positions in fields such as social and natural sciences, media, state and economic administration, and the army, which were indispensable to the functioning of the new state. Consequently, the SBZ leadership, which consisted of former Nazi prisoners or exiles, had to forge informal agreements with East Germans associated with Nazi fascism (Leonhard 1990, pp. 411). In July 1950, the 3rd Party Congress of the Socialist Unity Party of Germany (SED) announced that the "roots of fascism" had been eradicated in the GDR after a formalistic reappraisal of its fascist past and the nationalization of land and large-scale industry. As a result, legal debates surrounding coming to terms with Nazi history were discontinued, and the population avoided engaging in self-critical discussions and content (Münkler 2002).

In 1951, the SED counted approximately 175,000 former officers, non-commissioned officers (NCOs), and members of the NSDAP or its branches, but only around 16,000 were expelled (Otto 1993, p. 19). By 1953, approximately 25% of SED members and candidates were former members of the NSDAP or its branches. Additionally, the districts of Magdeburg, Halle, and Erfurt had between 26% and 35% of all SED members who were former functionaries of fascist organizations. The district of Wernigerode had the highest regional concentration of former Nazi members, with about 46% of SED members located there (Hafeneger and Buddrus 1994, p. 92).

3.2.2. Preserved mentalities

While the Federal Republic of Germany (FRG) began the process of coming to terms with the past later, but continued it with increasing intensity, the GDR started the process immediately but ended it prematurely due to ideological and power-political reasons (Neubacher 1994, p. 24). The placement of former Nazi officials in influential positions in East Germany had a significant impact on the social and individual consciousness of the region, as they were presented alongside the victorious armies of the USSR, reinforcing the impression that the GDR was the legitimate successors to the German Nazi regime (Waibel 2014, p. 71). On February 8, 1988, Erich Honecker, a former Nazi prisoner, gave a keynote speech to the 1st District Secretaries of the Free German Youth (*Freie Deutsche Jugend, FDJ*), where he recounted how young Germans, regardless of their political affiliation, had worked together after May 8, 1945, to rebuild the country. Honecker argued that former members of Nazi organizations such as the Hitler Youth (*Hitlerjugend, HJ*) or the League of German Girls (*Bund Deutscher Mädels, BDM*) had been victimized by the Nazis and had rediscovered their true ideals under his guidance in the FDJ. However, street battles

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[3] Yugoslavia and, to a lesser extent, Czechoslovakia were exceptions to this trend (Pop-Eleches and Tucker 2017, p. 42).

[4] According to the GDR, by the official end of denazification on March 10, 1948, a total of 520,000 former Nazi party members had been removed from office or subjected to "coercive measures." By the end of 1950, the courts had sentenced 12,147 "war criminals" and criminals against "humanity" (Assheuer and Sarkowicz 1992, p. 110).

with fascist skinheads had already erupted in the GDR, culminating in the 1987 attack on the Zion Church, which required police intervention and made headlines by the time of Honecker's speech (Waibel 2014, p. 80).

The GDR's anti-fascist democratic model, based on communist ideology, had a militaristic approach from the beginning, which allowed former Nazi officials to thrive. The ideology of communism placed emphasis on armed fighters and "democratic centralism," a quasi-military structure within the communist party, which combined with the authoritarian ideology of Marxism-Leninism. Moreover, the Cold War required a military framework to regulate public life, including speech and thought. These factors led to a militarization of society under state socialism that started in kindergarten and continued through higher education (Waibel 2014, p. 53).

In 1978, Military Education became a non-graded compulsory subject for the 9th and 10th grades of the Polytechnical High School (*Polytechnische Oberschule, POS*). This included a two-week military camp where students were trained in weapons handling and civil defense under the supervision of reserve officers or NVA officer students. Pre-military training continued in the upper grades of the Extended High School (*Erweiterte Oberschule, EOS*), where students received additional military training, including theoretical and practical instruction in hand grenade throwing, small-caliber machine gun shooting, military drill, and political theory. The Society for Sport and Technology (*Gesellschaft für Sport und Technik, GST*) was a paramilitary youth organization that marked the beginning of the militaristic orientation and conformity compulsion in large parts of East German society (Waibel 1996, pp. 174–176). With over 500,000 members in nearly 10,000 local groups, its primary function was to recruit young volunteers for the NVA's pre-military training programs, fostering a "nurture for hatred of the enemy" that permeated the lives of GDR's population (Weber and Pertinax 1958, p. 131). Other paramilitary organizations, such as the "fighting groups of the working class," (*Kampfgruppen*) were responsible for suppressing internal uprisings and ensuring the operational freedom of the NVA in case of defense. They had around 200,000 "fighters" in approximately 2,000 units armed with pistols, AK-47 rifles, heavy machine guns, and light infantry fighting vehicles (Waibel 1996; Waibel 2014).

3.2.3. Party monopoly

The state socialist regime aimed to militarize society for two reasons: to recruit individuals into the armed forces and to cultivate loyalty to the state and the ruling party. Understanding the connection between authoritarian and ethnocentric ideologies and the party's monopoly on power is crucial for comprehending the class dynamics of state socialist society. The party exerted unprecedented influence in shaping processes of obedience and mobility, politically defining property rights and redistributive power (Walder 1995; Solga 2018; Voslensky 1984). Intergenerational mobility into the social class of origin was initially high but declined as the socialist system consolidated. For instance, the 1959-61 cohort had over a third of individuals remaining in their original class, with men comprising over 40%, while only a quarter of the 1929-31 cohort did the same (Solga 2006). Women were less likely to attain high positions, despite gender equality being a socialist ideal. Access to the upper service class was influenced by social background, gender, and party affiliation, with members of older cohorts more likely to occupy high-ranking positions, having secured them during the labor shortage of the late 1950s and early 1970s due to the displacement of "bourgeois elements" from senior service positions (Solga 2006, p. 146).[5]

To gain access to high-ranking positions, political loyalty was essential, particularly affiliation with the ruling party, as it acted as a filtering mechanism for access to higher education. However, this recruitment pattern seemed meritocratic but actually limited access to privileged positions (Solga 2006; Solga 2018). In 1989, male party members with university degrees made up 63% of the upper service class, while nonmembers only accounted for 31%. Although a university degree remained necessary, loyalty to the regime became a prerequisite for promotion to the upper service class (Eyal et al. 1997; Solga 1994). The upper service class had political power over state property, but no legal rights to it. Therefore, maintaining benefits for their descendants increasingly relied on their access to higher education, which was limited to only 10% of each freshman cohort by 1970. This restriction affected the descendants of the upper service class who entered higher education, leading to a social division of student cohorts as the political division solidified the social hierarchy (Salheiser 2012).[6]

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[5] It is worth noting that by 1961, around 3 million people, mostly from the middle class, intellectuals, and the highly educated, had left the GDR (Bauernschuster et al. 2012).

[6] While loyalty to the system was essential for promotion, it had limits, as demonstrated by the peaceful course of the 1989 demonstrations in Leipzig, where the GDR's system-bearing strata were no longer willing to defend the state with all their might (Salheiser 2012).

In summary, the East German state emphasized anti-fascism as a state doctrine over socialism, using it to criticize West Germany and promote anti-Zionist and anti-American policies abroad, and to unite opposition groups at home (Knütter 1993, p. 5). Those who opposed socialism or had anti-communist and anti-Soviet views were often labeled as fascists, evident in the "fascist Tito regime" in Yugoslavia and the "fascist terror of the Bonn government" (Giordano 1987). This ideology was heavily reinforced in schools, media, and youth organizations through visits to national memorials, rallies, and youth movements (Schubarth et al. 1991; Giordano 1987). The state heavily monitored and sanctioned individuals, resulting in a rigid class structure where political loyalty to the state, demonstrated through party membership and commitment to anti-fascism, was essential for career advancement, creating a system of organized dependency (Böröcz and Southworth 1996, p. 817; Walder 1995, p. 311). Despite initial openness, the class structure in the GDR became rigid, with upward mobility from the working class to the upper service classes even lower in East Germany than in West Germany in the 1980s (Mayer and Solga 1994).

3.3. The model

3.3.1. Introduction

In Section 3.2, I provided a framework for understanding the inner workings of the GDR, and I distilled the process of trait formation into three key factors: priors, sources of information, and the opinion formation process.

1. Priors: The initial traits of an individual or group play a crucial role in the formation of any opinion model. In the case of the GDR, these traits were derived from the mental dispositions of the German population post-WWII, including former party members and supporters of Hitler. The aim of state socialism was to establish political legitimacy and stability through homogeneity in origin and ideology.

2. Sources of Information: The process of opinion formation involves updating preconceptions by incorporating new information received through various sources, such as social networks, personal experiences, the behavior of others, and conversations. In the GDR, important sources of information included the principles of anti-fascism, the involvement of all citizens in collective processes, and party membership for social advancement.

3. Opinion Formation Process: Individuals combine priors and information to form a posterior via an updating process. Those who were exposed to communist messages through mass organizations, the party, or a centralized school system were exposed to a stronger version of the communist message. As each successive generation is exposed to or benefits from the message, their impact on pro-regime attitudes is expected to increase.

Building on the ideas of Boyd and Richerson (1985), I expand on the canonical opinion dynamics model of Bisin and Verdier (2001). The model presents a binary culture in which moral beliefs are transmitted from parents to children and spread across society. Parents have "imperfect empathy," meaning they evaluate the usefulness of their children's future actions based on their own preferences, which can lag behind their children's. As a result, parental socialization involves a significant investment that aims to raise children who have "similar" traits. A lower investment in socialization increases the chances that a child will adopt the majority population's traits. Thus, parents with minority characteristics are especially motivated to intervene actively in the socialization process to reinforce their minority's cultural traits. The imperfect empathy assumption alone in Bisin and Verdier (2001)'s model is sufficient to create long-term heterogeneous traits due to cultural substitution.

Yet, the persistence of diverse cultural traits is not only due to imperfect empathy, as the discrete nature of traits in Bisin and Verdier (2001)'s model precludes partial assimilation or geographical variation in preferences (Voigtländer and Voth 2012). In addition, children's preferences are significantly influenced by their parents and social environment (Avdeenko and Siedler 2016). To address this issue, I utilize Bisin and Verdier (2001)'s model in a non-Bayesian DeGroot process of social and intergenerational learning, where the social network plays a crucial role in determining the emergence, development, and persistence of preferences (DeGroot 1974). This approach explains the remarkable longevity of communist regimes in Eastern Europe compared to other authoritarian regimes of the 20th century, as they had opportunities to eliminate earlier formal and informal institutions (Pop-Eleches and Tucker 2017, p. 45).

In this framework, actors observe signals once, communicate with each other, and update their beliefs using a rule of thumb via a weighted and directed confidence matrix. Unlike a Bayesian approach, this method does not require actors to have a reliable model of the world or prioritize every possible state of the world, which is unlikely to be the

case empirically. Moreover, the discrete nature of preferences provides a structure to the updating problem, as it rules out certain events with zero probability, thereby limiting the flexibility of the model in cases of indoctrination and the spread of misinformation. The inference problem faced by Bayesian agents in a complex social network with information transmission presents a further challenge. Hence, a non-Bayesian DeGroot framework is better suited in the context of (mis)information dissemination and indoctrination (Acemoglu and Ozdaglar 2011, p. 7).[7]

In order to account for the continuous nature of cultural traits, I adopt a model in which these traits are represented as continuous variables, following the approach of Buechel, Hellmann, and Pichler (2014). As shown in previous research by Bisin and Verdier (2001), children's socialization is influenced both vertically and horizontally, and parents display imperfect empathy. However, parents primarily use their behavior to socialize their children, which is closely linked to their socioeconomic choices. This creates a strategic interaction between parents' true and displayed traits, which may result in a misrepresentation of their true traits, such as through exaggeration or downplaying. Each adult has an incentive to deviate from their true behavior to counteract the perceived negative influence of a "hostile" society on their child. The extent of this deviation increases with the cultural distance between parents and their social environment.

Building on the model of Buechel, Hellmann, and Pichler (2014), I introduce a political regime seeking legitimacy, such as a religion or a dictator. Legitimacy is defined similarly to Greif and Tadelis (2010) as the extent to which people feel morally obligated to follow the morality of the state. Legitimacy is a valuable asset for a regime as it affects its chances of staying in power. A new regime benefits from a moral shift in its favor, allowing it to advance its agenda. Sanctions against non-compliance with the preferred behavior of the new authority, such as cutting subsidies or restricting access to education or employment opportunities, serve as a power tool (Schroeder 2013, p. 709). This funnel mechanism is modeled through the introduction of a centralized school system that changes the probability of socialization towards the behavior favored by the authority. The more effective the school indoctrination, the less likely parental socialization will lead to oppositional attitudes. The centralized school system tilts the parental socialization process towards the attitude preferred by the state, over and above the existing proportion of the population that already shares that attitude.

To explore the dynamics of cultural traits, I assume a Nash equilibrium in each generation. In the long run, these cultural traits converge to a homogeneous trait, and the relative positions remain consistent if children are mainly influenced by their parents. However, if society has a stronger influence on each child, the dynamics become more complex, and the relative positions of the traits change from one generation to the next. Strong incentives for socializing children can even lead to divergent dynamics (DeGroot 1974). Loyalty to the ruling system, or the convergence in traits, is achieved through a Markov transition matrix with strong connectedness and aperiodicity that links different beliefs over time. Row stochasticity further ensures that the process converges to a stationary distribution that is set in motion by a vector of eigenvalues, which determine the rate of convergence and the success of the new policy actor in bringing about a change in behavior leading to a new steady state. If the network is positively definite and the level of imperfect empathy is sufficiently low, convergence is guaranteed. Positive definiteness is present when parents have a large influence on their children. Large socialization weights promote convergence to the steady state, while high levels of imperfect empathy hinder it. When imperfect empathy is more pronounced, cultural traits tend to be more consistent, prolonging cultural heterogeneity (Buechel, Hellmann, and Pichler 2014, p. 278).

The convergence of cultural traits towards a new political ideology is influenced by various factors. Party affiliation is a significant factor that affects social mobility and career advancement opportunities, directly influencing the prevalence of the Communist Party in urban centers. As rapid industrialization in these areas is promoted by Communist governments, it reinforces urbanization as a factor in political loyalty. Additionally, gender plays a role in political convergence, with men more likely to be recruited into the armed forces and workplace than women, which speeds up the assumption of their political loyalties (Hoffmann 2011; Berkhoff 2012; Pop-Eleches and Tucker 2017). Parental socialization can either strengthen or weaken attitudes loyal to the regime, depending on whether parents are supporters or dissidents of the regime. Furthermore, age and education affect resistance to communist socialization efforts, with adults being more resistant than children. Education generally increases resistance to later socialization, while nurture under communist rule tends to decrease it. Additionally, pre-communist characteristics

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[7] See also Golub and Jackson (2010), who focus on asymptotic learning in growing networks and suggests that crowds can be intelligent if there are no overly influential agents. DeMarzo et al. (2003) explores a variant of the DeGroot model and finds that agents are not accountable for the repeated transmission of information in the network. Other investigate the introduction of new information in each round, such as Jadbabaie et al. (2013), and even the manipulation of information, as in Förster et al. (2014).

such as religious or fascist education and nurture may increase "resistance" to communist propaganda, with religious institutions serving as bulwarks against communist indoctrination attempts (Pop-Eleches and Tucker 2017; Darden and A. Grzymala-Busse 2006; Wittenberg 2006).

3.3.2. The formation of traits

For this model, consider an overlapping generations model where a society is composed of n symmetric dynasties, denoted by $N = 1, \ldots, n$, and each dynasty is represented by a particular birth cohort. At the start of each period $t \in N$, parents reproduce and have only one offspring to ensure a constant population. Assume further, that this society has recently undergone a regime change that resulted in a 180-degree shift in incentive structure and ideology. To be consistent with historical cases, suppose that most dynasties were socialized in the old system, i.e. fascism. The population possesses a continuous trait that characterizes a particular aspect of human nature, such as risk aversion or patience, and its continuous nature represents different intensities or discount factors. In this analysis, I focus on the transmission of one such trait: the preference for communism. Let $\mathcal{J} \subseteq \mathbb{R}$ define a convex compact set that contains all possible intensities for this trait. If communism is represented by a discount factor, then $\mathcal{J} = [0, 1]$. Additionally, let each adult be characterized by a specific variable $\phi_i(t) \in \mathcal{J}$, which represents his or her true adherence of communism. Low levels of $\phi_i(t)$ represent the t-th generation of dynasty i having low levels of communism, which would indicate a more right-wing orientation.[8]

It is DeMarzo et al. (2003), who assume that agents report their beliefs truthfully. However, in the context of the first workers' and peasants' state in the GDR, social advancement depended on overtly displayed and possibly dishonest allegiance to both party and state. To account for this, I assume that true preferences are unobservable to outsiders and that adults may misrepresent their true traits (i.e., be dishonest).[9] However, dishonesty can have various facets, with strategic considerations about social mobility being surely just one of them. They share the commonality that different cultural characteristics can be associated with different socioeconomic choices. Therefore, the motivation to deviate from one's true opinion is based on the parents' preference for social advancement.

Therefore, assume children can only observe the adults' publicly displayed actions, which coincide with their observable socioeconomic choices. Consequently, an individual who openly rejects the majority opinion will have less access to influential positions. Model-wise, I therefore assume that each adult generation selects an observable measure of political loyalty crucial for their socioeconomic actions. This choice is denoted by $\phi_i^d(t) \in \mathcal{J}$ and referred to as i's diplayed level of communism. Let $\Phi^d(t) := (\phi_i^d(t), \ldots, \phi_n^d(t))^\top \in \mathcal{J}^n$ represent the vector, which collects all displayed levels of communism among the adult population. Note that the displayed level of communism $\phi_i^d(t)$ may differ from an adult's true conviction, $\phi_i(t)$. However, this cognitive dissonance is uncomfortable and comes at a significant cost. Hence, any deviation from true trait intensity is costly and reduces parental utility, with the cost increasing as the extent of cognitive dissonance increases (Festinger 1957; Bernheim 1994).

Children in this model acquire their preference for communism from the observable behavior of adults. I distinguish between vertical (direct) and horizontal (indirect) socialization. While the former refers to the parental transmission of traits, the latter captures the transmission of the social environment, i.e., their network. Following, children observe not only the parental displayed trait, $\phi_i^d(t)$, but also that of their social environment, $\phi_{Ni}^d(t)$, which represents the displayed adherence to communism of other parents in the same social environment. Let σ_{ii} denote the weight of the parental socialization component, which determines how much a child learns from her parents relative to her social environment. This weight is largely determined by the social interaction between parent and child, i.e., the amount of time parents invest in their children's upbringing. Let the Equation 1 formalize this trait formation process:

$$\phi_i(t+1) = \sigma_{ii}\phi_i^d(t) + (1 - \sigma_{ii})\phi_{Ni}^d(t) \tag{1}$$

Equation 1 shows, that the continuous trait of a child is determined by a combination of their parents' observed adherence to communism, $\phi_i^d(d)$, and the societal average level of observed communism, $\phi_{Ni}^d(t)$. The subscripts further indicate, that children are socialized by their individual social environment, resulting in different social networks influencing their opinion formation and, thus, geographical variations in opinions. Hence, parental misrepresentation of views affects the emergence of genuine commitment to or rejection of communism in their children.

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[8] Note that I use the term 'dynasty' interchangeably with 'family'.
[9] This assumption is borrowed from Buechel, Hellmann, and Pichler (2014).

A socialist planner aims to build a homogeneous and anti-fascist society entirely focused on labor, but faces a numerically overwhelming mass of old regime supporters and elites. To effect change, a centralized school system is implemented that interferes with the parental socialization process. The effectiveness of this system is denoted by $\psi \in (0,1]$, where higher ψ corresponds to a more effective school indoctrination and a lower probability of parental socialization success, i.e., $(\sigma_{ii} - \psi)$. It corresponds to a redistribution of time invested in favor of the society, during which children are continuously bombarded with socialist values. Consequently, when $\psi = 1$, the school perfectly indoctrinates those not socialized by their parents and negatively affects the likelihood of children with non-communist parents adopting non-communist traits. I define the remaining parental socialization success component under centralized schooling as $\psi_{ii} = \sigma_{ii} - \psi \geq 0$. Thus, the remaining horizontal socialization success component is $1 - \psi_{ii} = 1 - (\sigma_{ii} - \psi) = 1 - \sigma_{ii} + \psi$, where σ_{ii} accounts for the parental success component. The standard DeGroot trait formation process can be redefined accordingly as in Equation 2:

$$\phi_i(t+1) = (\sigma_{ii} - \psi)\phi_i^d(t) + (1 - \sigma_{ii} + \psi)\phi_{Ni}^d(t) \Rightarrow \phi_i(t+1) = \psi_{ii}\phi_i^d(t) + (1 - \psi_{ii})\phi_{Ni}^d(t) \tag{2}$$

To clarify the relationship between children and adults in a given social context, I introduce a weighted and possibly directed social network matrix Ψ of size $n \times n$. This network connects the dynasties in the model and relates them to each other through the centralized school system. To account for the influence of parents versus the other dynasties in the social network, it is assumed that Ψ is row-stochastic, meaning that $\psi_{ij} \geq 0$ for all $i, j \in N$ and $\sum_{j \in N} \psi_{ii} = 1$ for all $i \in N$. Here, ψ_{ij} represents the relative cognitive influence of parent j on child i. The diagonal elements of Ψ represent the parental socialization success of both parents with their own child, which is reduced by the effectiveness of school indoctrination, i.e., $\psi_{ii} = \sigma_{ii} - \psi$. Finally, the off-diagonal elements, $\psi_{ij} = \sigma_{ij}$, are used to average over the displayed levels of communism in the model society. With these modifications, I can redefine the overall adults' displayed traits in the social network, i.e., those of the child's entire social environment, as $\phi_{Ni}^d(d) := \sum_{j \in Ni} \frac{\psi_{ij}}{1 - \psi_{ii}} \phi_j^d(t)$. This eventually allows for the reformulation of the standard DeGroot process of opinion formation for the whole society as in Equation 3, where Ψ describes a matrix of transition probabilities of a Markov chain with n states, from time t to $t+1$:

$$\Phi(t+1) = \Psi\Phi^d(t) \tag{3}$$

An important part of the modeling that follows is that the traits that individuals learn in their formative years become a permanent part of their personality by the time they grow into adulthood. In shaping children's political attitudes, parental socialization is arguably the most important factor and can either reinforce or counteract communist involvement, depending on the social context. If parents strongly support communist rule, their children are all the more likely to adopt attitudes consistent with communist ideology. If, on the other hand, the parents are critical of communism, their children may develop an attitude contrary to it (Pop-Eleches and Tucker 2017, pp. 14). The centralized school system plays an equally important role in shaping the characteristics of subsequent generations. It determines two individual-level factors. The first factor is the age at which individuals are exposed to communism. Studies by Osborne et al. (2011) and Krosnick and Alwin (1989) indicate that children are more susceptible to political socialization towards socialism than adults, suggesting that early exposure to communism during childhood is strongly associated with the adoption of attitudes that align with socialist ideology. The total number of years spent under communist rule also has a similar effect.[10]

In mathematical terms, for every adult individual $i \in I$, they select a publicly displayed trait denoted as $\phi_i^d(t) \in \mathcal{J}$ that maximizes his or her utility. The respective utility function then takes into account the parents' own utility obtained from deviating from their true trait, and a cross-generational utility component that considers the assumed character trait of their child. Specifically, the parental utility function can be expressed as $u_i : \mathcal{J} \mapsto \mathbb{R}$ for the utility derived from their publicly displayed level of adherence to communism $\phi_i^d(t)$, and $v_i : \mathcal{J} \mapsto \mathbb{R}$ for the utility derived from their child's assumed trait. Standard assumptions are incorporated into the parental utility function, and it shall be represented in Equation 2:

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[10] The pre-communist regime type is also a crucial factor in this model, as pre-communist conditions are necessary for resistance to communist rule. Conversely, factors such as urban residence, masculinity, membership in the SED, and communist education are essential mechanisms for the adoption of pro-regime attitudes in later life. Taken together, these factors contribute to the development of pro-communist attitudes among individuals. However, communist socialization may also affect adults more than children, contradicting the assumption of the impact of the communist school system. This aligns with the idea that individuals are more likely to adopt enforced groupthink in adulthood under an authoritarian regime (Pop-Eleches and Tucker 2017, pp. 14).

Assumption 2 (Parental utility function) *Let the utility function of an adult $i \in N$ at time $t \in \mathbb{N}$ be represented by an additive function that consists of two distinct utility components:*

$$u_i(\phi_i^d(t)|\phi_i(t)) + v_i(\phi_i(t+1)|\phi_i(t)) \tag{4}$$

where:

(i) *$u_i(\cdot|\phi_i(t))$ is a single-peaked function that attains its maximum at $\phi_i(t)$, which implies that it is strictly increasing or decreasing for all $\phi_i^d(t) \in \mathcal{I}$ such that $\phi_i^d(t) \lesseqgtr \phi_i(t)$.*

(ii) *$v_i(\cdot|\phi_i(t))$ is a single-peaked function that attains its maximum at $\phi_i(t)$, which implies that it is strictly increasing or decreasing for all $\phi_i(t+1) \in \mathcal{I}$ such that $\phi_i(t+1) \lesseqgtr \phi_i(t)$.*

(iii) *$u_i(\cdot|\phi_i(t))$ and $v_i(\cdot|\phi_i(t))$ are continuous functions that are twice continuously differentiable and strictly concave.*

The utility function above differs from the standard DeGroot model, but its additive separability and assumptions make it much easier to interpret. For example, Part (i) describes how the adult's utility level, represented by u_i, decreases with the cognitive dissonance between his or her actual endorsement of communism and his or her publicly displayed affiliation. Consequently, when an adult's actions are inconsistent with his or her beliefs, he or she suffers a utility loss. Following, his or her level increases the closer his or her displayed opinion is to his or her true belief. Part (ii) describes the intergenerational utility component and establishes the difference between the parents' true beliefs and the trait adopted by the child. This allows for two possible interpretations: One is that children make independent socioeconomic choices, while parents consider only their children's choices. In this view, children maximize their own utility share, represented by v_i. A second is, that parents suffer a utility loss if their child's adopted trait differs too much from their own. This interpretation seems more plausible to me in the context of a social planner striving for homogeneity, and so I give it priority. Part (iii) ultimately describes how both utility components are aggregated in the context of an additively separable utility function, which greatly simplifies the model's analytical complexity. Finally, the choice of publicly displayed system loyalty affects not only an adult's own child, but also the children of all affiliated dynasties.

3.3.3. The adult's decision

From the previous discussion, the optimization of each adult $i \in N$ is defined as:

$$\max_{\phi_i^d(t) \in \mathcal{I}} u_i(\phi_i^d(t) \mid \phi_i(t)) + v_i(\phi_i(t+1) \mid \phi_i(t))$$
$$\text{s.t. } \phi_i(t+1) = \psi_{ii}\phi_i^d(t) + (1-\psi_{ii})\phi_{Ni}^d(t) \tag{5}$$

in any period $t \in \mathbb{N}$. The parental utility optimization problem introduced in Equation 5 and the modified DeGroot model consequently represent a tradeoff between two components of utility loss. The first component is the social advancement associated with privileged access to scarce goods and networks in this state socialist model society. The second comes from the family's socioeconomic improvements that result from the traits adopted by the child. The solution to this optimization problem thus yields the optimal intensity of the parent's displayed trait and represents his or her best response to both the displayed traits of the child's social environment and his or her true loyalty to the state and party, i.e., $\phi_{Ni}^d(t)$ versus $\phi_i(t)$. It takes into account any deviation from the true trait and the dependence on the displayed level of adherence to communism in the model society. Here, the former measures the parental socialization incentives or disincentives that parents are willing to accept for their intergenerational benefit. Therefore, they correspond to the cultural substitution between vertical and horizontal substitution. Proposition 1 shall then characterize the solution to the parental optimization problem.

Proposition 1 (Parental best responses in displayed traits) *For any adult $i \in N$ and any trait $\phi_i(t) \in \mathcal{I}$, there exists a unique function $\phi_i^{d*}(\phi_i(t), \phi_{Ni}^d(t))$ that represents the best response displayed trait, where $\phi_{Ni}^d(t)$ is the displayed trait of the adjacent family i at time t. This function satisfies the following properties:*

(i) *If $\psi_{ii} \in (0,1)$, $\phi_{Ni}^d(t) = \phi_i(t)$, or $\phi_i(t)$ is on the boundary of the trait space $\mathcal{I}$, then $\phi_i^{d*}(\phi_i(t), \phi_{Ni}^d(t)) = \phi_i(t)$.*

(ii) *If $\psi_{ii} \in (0,1)$ and $\phi_{Ni}^d(t) > \phi_i(t)$, and $\phi_i(t)$ is in the interior of $\mathcal{I}$, then $\phi_i^{d*}(\phi_i(t), \phi_{Ni}^d(t)) < \phi_i(t)$.*

(iii) If $\psi_{ii} \in (0,1)$ and there exist two displayed traits $\phi_{Ni}^d(t)$ and $\tilde{\phi}_{Ni}^d(t)$ such that one of the best responses $\phi_i^{d*}(\phi_i(t), \phi_{Ni}^d(t))$ or $\phi_i^{d*}(\phi_i(t), \tilde{\phi}_{Ni}^d(t))$ is in the interior of $\mathcal{I}$, then $\phi_i^{d*}(\phi_i(t), \tilde{\phi}_{Ni}^d(t)) > \phi_i^{d*}(\phi_i(t), \phi_{Ni}^d(t))$ if and only if $\tilde{\phi}_{Ni}^d(t) < \phi_{Ni}^d(t)$.

Part (i) of Proposition 1 asserts that when children are either perfectly indoctrinated by the school system ($\psi_{ii} = 1$) or when the centralized school system completely fails or is absent ($\psi_{ii} = 0$), parents will not deviate from their true trait ($\phi_i^{d*} = \phi_i(t)$). Similarly, if traits in the social environment match that of the parents ($\phi_{Ni}^d(t) = \phi_i(t)$), parents will also not deviate from their true loyalty. In such cases, children will become the exact copies of their parents. Part (ii) of Proposition 1 discusses how parents can counteract the effects of horizontal socialization influences on their children. If parents find, that their children's political loyalty to the state and party differs from their own, they will choose an appropriate level of displayed loyalty to counteract the social influence of others. In doing so, they always deviate in the opposite direction of the displayed trait in the social network; i.e. display more/less commitment to communism. To give an example, religious individuals who are hostile to the communist regime may have an incentive to counteract the scientific atheism teachings as part of the Maxist Leninist doctrine. As a result, the state may have less power over religious individuals in terms of shaping their political views (A. M. Grzymala-Busse 2015; Wittenberg 2006). It is important to mention that the model does not necessarily suggest that individuals with a religious background from pre-communist era are more opposed to the Soviet socialist project's ideals. Instead, it implies that their resistance is more robust, and each successive generation exposed to communism is less affected by its message compared to those without such backgrounds (Pop-Eleches and Tucker 2017, p. 13). Comparable dynamics then apply to people with strong allegiances to past regimes, like ardent Hitler supporters who use a "red scare"-type of argument to deter their children from adopting communist beliefs. Part (iii) of Proposition 1 concludes that the distance between publicly displayed adherence to state and party and true approval increases with the distance between the true and displayed trait in the representative environment. Formally, if two displayed traits, $\tilde{\phi}Ni^d(t) < \phi Ni^d(t) < \phi_i(t)$, then $\phi_i^{d*}(t)(\phi_i(t), \tilde{\phi}Ni^d(t)) > \phi_i^{d*}(t)(\phi_i(t), \phi Ni^d(t))$. Proposition 2 characterizes the Nash equilibrium for displayed loyalty as the best response to the previously mentioned factors.

Proposition 2 (Nash equilibrium) *Let $\mathbb{N}$ be a set of natural numbers. Then, for every $t \in \mathbb{N}$, there exists a Nash equilibrium in displayed traits denoted as $\Phi^{d*}(t) = (\phi_i^{d*}, ..., \phi_n^{d*}(t))^\top$. Here, $\Phi^{d*}(t)$ is a vector that represents the Nash equilibrium in displayed traits at time t. Furthermore, ϕ_i^{d*} represents the strategy of family i at equilibrium, and $\phi_n^{d*}(t)$ represents the strategy of family n at equilibrium, both with respect to their displayed traits.*

To analyze the dynamics of trait formation and societal interaction, consider two families or "dynasties" denoted by $N = 1, 2$. Assuming the validity of Parts (i) – (iii) of Assumption 2, the optimization problem from Equation 5 can be described for both dynasties. The concept of multigenerational dynamics is now relevant, and from now on, I will refer to each family as a "dynasty". Now, let $\phi_1(t)$ and $\phi_2(t)$ denote the political loyalty expressions for each dynasty, where $\phi_1(t) < \phi_2(t)$. According to the general opinion formation process of children as defined in Equation 1, their true approval of the state-socialist social system $\phi_1(t+1)$ and $\phi_2(t+1)$, are derived from the parental best responses to the displayed political loyalties in the society as a whole. Specifically, this results from $\phi_1(t+1) = \psi_{ii}\phi_1^d(t) + (1-\psi_{ii})\phi_2^d(t)$ and $\phi_2(t+1) = \psi_{ii}\phi_2^d(t) + (1-\psi_{ii})\phi_1^d(t)$, where $\phi_i^d(t)$ denotes the political loyalty of dynasty i displayed in society at time t, and ψ_{ii} represents the parental weight parameter. Proposition 1 further asserts that parents' displayed trait would be more extreme in their manifestations than their true traits at time t, because they would attempt to offset the perceived harmful influence of the other dynasties through investing in socialization. This can be mathematically expressed as $\phi_1^{d*}(t) \leq \phi_1(t) < \phi_2(t) \leq \phi_2^{d*}(t)$. Here, $\phi_1^{d*}(t)$ and $\phi_2^{d*}(t)$ represent the Nash equilibria in displayed traits for the two dynasties at time t. For example, if dynasty 1 has a higher preference for communism than dynasty 2, dynasty 1 will exhibit stronger advocacy to counteract the influence of dynasty 2. Likewise, dynasty 2 will be more active to counteract the harmful influence of dynasty 1. At equilibrium, child 1 will show a greater approval of the state socialist social system than child 2, as was the case for their parents. And although relative differences in political loyalties persist in the long term, they may nevertheless converge over time.

$$\phi_1(t+1) \leq (<)\phi_2(t+1) \iff 1 \geq (>)\psi_{11} + \psi_{22} \tag{6}$$

The relative positions of the two dynasties' political loyalties only remain the same if the sum of the probabilities of then state's successful indoctrination, $\psi_{11} + \psi_{22}$, is greater than or equal to one. This condition is satisfied if

the centralized school system only inadequately indoctrinates children, i.e. when children are primarily socialized by their parents, which occurs when $\psi_{ii} \leq \frac{1}{2}$ for each dynasty $i = 1, 2$. In the absence of any centralized school system, i.e., when $\psi_{ii} = 0$, children will mirror their parents exactly as $\psi_{ii} = 0 \longrightarrow \sigma_{ii} = 1$. When imperfect indoctrination occurs through the centralized school system, the political loyalties of both dynasties gradually converge over time, and $\psi_{11} + \psi_{22} > 1$. If both dynasties are equally successfully indoctrinated by the state socialist system, i.e., $\psi_{11} + \psi_{22} = 1$, then their political loyalties converge in one step move and assign equal weight to each other's influence. However, if parental socialization outweighs societal socialization, i.e., $\psi_{11} + \psi_{22} \leq 1$, or if the society has a socialization advantage compared to the parents, then the relative position of the trait expression, i.e., the endorsement of the state-socialist social order, will change each period. Therefore, at any given time t which belongs to the natural numbers $\mathbb{N}$, the difference in political loyalty between the two dynasties changes sign. That is, $sign(\phi_2(t+1) - \phi_1(t+1) = -sign(\phi_2(t) - \phi_1(t)))$.

3.3.4. The dynamics of traits

The social network

I already briefly touched upon the importance of the social network in determining the evolving trait through individual linkages to other dynasties. In this section, I will explore in detail the role of the social network in promoting convergence in individual traits and ensuring their persistence. Firstly, I will describe the relationships between dynasties, represented by the ψ_{ij}'s for $i, j \in N$, where $N = 1, ..., n$. These interactions are facilitated by a social learning matrix, represented by an $n \times n$ row stochastic matrix Ψ. This matrix contains information on both horizontal and vertical socialization weights, i.e., σ_{ij} and σ_{ii}, as well as the effectiveness of the centralized school system in indoctrinating children, i.e., ψ. The social network can be compared to a village with a school and its structure is primarily determined by its diagonal elements. The parental socialization success share is represented by σ_{ii}, that is adjusted by the effectiveness of the indoctrination process ψ_{ii} for $i \neq j$. The block structure of the matrix Ψ, then determines which subgroups of society will reach consensus in the long run, and, similar to the standard DeGroot model, dynasties within closed and strongly connected groups, referred to as essential communication classes, will reach consensus (DeMarzo et al. 2003; Golub and Jackson 2010).

Assuming that all dynasties update their preferences, the state's indoctrination efforts are imperfect such that the socialization is influenced to some degree by the parents, as represented by $0 < \psi_{ii} < 1$ for all i. According to the notation of Jackson (2008) and DeMarzo et al. (2003), two dynasties communicate if there is a directed path in the network structure from i to j and from j to i. I denote this communication as $i \backsim j$, which means i and j are communicating; i.e. $i \rightarrow j$ respectively $j \rightarrow i$. This implies that there exists a number of communication classes $k \in 1, \cdots, n$ such that $(\Psi_{ij})^k > 0$. A dynasty is self-communicating if $i \backsim i$. Here, the symbol $\backsim$ connects dynasties N with each other and allows the partition of the social network Ψ into equivalence classes. For any Markov chain transition matrix, it is possible to perform a disjoint partitioning that leads to a unique decomposition of the trait space into a sequence of disjoint subsets for each Markov chain. These subsets are known as "communication classes" and represent the communication behavior of each dynasty towards the others. At this point, I consider a communication class to be self-communicating if $\mathcal{P}(\Psi) = L_1, ..., L_k, \mathcal{R}$ and $i \equiv j$ exists if and only if there exists an $L \in \mathcal{P}(\Psi)$ such that $i, j \in L$. Communication classes can be further divided into essential and inessential based on their importance in the social network. An essential communication class $L \in \mathcal{P}(\Psi)$ satisfies the property that for all $i \in L$, there exists no $j \notin L$ such that i, j is just j. In the context of social networks, these essential communication classes refer to strongly connected or closed groups. Any class that is not essential is called inessential, and its members represent the rest of society, denoted by $\mathcal{R}$ and referred to as the rest of the world (ROTW).[11] To summarize, all of these statements imply that the social network Ψ can be divided into communication classes, and these classes can be further categorized as essential or inessential.

Definition 1 (Communication classes in the Markov chain) *Let $\mathcal{P}(\Psi) = L_1, ..., L_k, \mathcal{R}$ be a partition of the set of dynasties N into $k \geq 1$ communication classes and a (possibly empty) set $\mathcal{R}$ representing the rest of the world, such that:*

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[11] The designation is borrowed from Buechel, Hellmann, and Klößner (2015).

(i) *Each communication class L_k is strongly connected, meaning that for all $i, j \in L_k$, there exists an integer $k \in 1, \ldots, n$ such that $(\Psi_{ij})^k > 0$.*

(ii) *Each communication class L_k is closed, meaning that for all $i \in L_k$, if $\Psi_{ij} > 0$ then $j \in L_k$.*

(iii) *I refer to the strongly connected and closed communication classes as essential communication classes.*

(iv) *The set $\mathcal{R}$ contains dynasties that do not belong to any closed and strongly connected dynasties, hence they are inessential, i.e., $\mathcal{R} = N \prod_{k=1}^{K} L_k$.*

By suitable renumeration, the Markov transition matrix Ψ can be partitioned into blocks that correspond to the groups of the partition $\mathcal{P}$:

$$
\Psi = \begin{pmatrix}
\sigma_{11} - \psi & \mathbf{0} & \cdots & \cdots & \mathbf{0} \\
\mathbf{0} & \ddots & \ddots & \cdots & \vdots \\
\vdots & \ddots & \ddots & \ddots & \vdots \\
\mathbf{0} & \cdots & \mathbf{0} & \sigma_{kk} - \psi & \mathbf{0} \\
\sigma_{\mathcal{R}1} & \cdots & \cdots & \sigma_{\mathcal{R}k} & \sigma_{\mathcal{R}\mathcal{R}} - \psi
\end{pmatrix},
\tag{7}
$$

Specifically, the diagonal elements ψ_{ii} correspond to the submatrix of Ψ consisting of rows and columns belonging to the same communication class L_k, while $\sigma_{\mathcal{R}\mathcal{R}}$ is the submatrix of Ψ consisting of rows and columns belonging to the ROTW.

To analyze the convergence dynamics along the Markov chain, the dynamics in each part of the network must settle to a certain point, allowing an independent study of the property formation dynamics in each communication class L_k. This is achieved by extending the social structure of Ψ in the standard DeGroot model to a more general setup, i.e., Ψ^t for all time periods. However, for dynasties in the ROTW, multiple essential communication classes may be relevant. Despite this, convergence in political loyalty to state and party does converge within the essential communication classes regardless of what happens in the ROTW. In the event that dynasties exist in isolation or form a singleton, the convergence properties depend only on the efficacy of the school indoctrination. Interestingly, one very nice feature of this model is, that even though these dynasties are not influenced by others, they may still exert an influence on others. In the ROTW, there is a convergence to more heterogeneous traits, with the long-term traits evolving from a convex combination of the original traits in the essential communication classes influencing the ROTW. Consequently, the convergence of traits requires convergence of dynamics within each group, similar to the classical DeGroot model. In summary, the interaction structure of Ψ partitions society into communication classes, and heterogeneous traits may persist in these groups and the ROTW in the long run, even if convergence to a homogeneous trait is achieved within the essential communication classes. These findings align with DeGroot's standard model, which can be expressed as:

Proposition 3 (Steady states) *Let $\Phi(t)$ be a profile of traits in $\mathcal{I}^n$ at time t that remains unchanged at time $t + 1$, i.e., a steady state. The following holds for any such steady state $\Phi(t)$:*

(i) *Parents choose their displayed traits equal to their own traits, i.e., $\Phi(t) = \Phi^{d^*}(t)$.*

(ii) *The traits of dynasties in essential communication classes $L \in \mathcal{P}(\Psi)$ are the same, i.e., $\phi_i(t) = \phi_j(t)$ for all $i, j \in L$.*

(iii) *The traits of dynasties in inessential communication classes $L' \in \mathcal{P}(\Psi)$ are convex combinations of traits in essential communication classes $L \in \mathcal{P}(\Psi)$, such that L' approaches L.*

In other words, in a steady state, parents pass on their traits to their children, and the traits of dynasties in the same essential communication class coincide. For dynasties in inessential communication classes, their traits are a combination of traits in essential communication classes, and over time, these inessential classes converge to the essential ones. In order to see this, it is necessary for Part (i) of Proposition 3 to hold true, which states that children inherit the same trait as their parents in a steady state and in the presence of ineffective centralized schooling. Equation 1 implies that the political loyalty of parents must match the political loyalty of the environment, or that parents have either no influence or full influence on their child, i.e., $\psi_{ii} \in [0, 1]$ and $\psi_{ii} \in [0, 1]$. Therefore, if two dynasties are related and form an essential communication class, their children will share the same political loyalty in a steady state, as stated in Part (ii) of Proposition 3. Furthermore, Part (iii) of Proposition 3 specifies that nonessential communication classes are influenced by essential communication classes, but not vice versa.

This relationship suggests that dynasties in essential communication classes who interact regularly can form a powerful guiding political culture ("Leitkultur"). It ultimately shapes the traits of their offspring, which become more pronounced as generations pass. The dynasties that form the Leitkultur also have a significant impact on the ROTW, albeit in a unidirectional manner (Golub and Sadler 2016). However, the ROTW dynasties have no influence on the political loyalty of the leading dynasties. But, once they receive attention from external sources, they gain significant influence over other flexible actors in the social network. As a result, even minor differences in weighting can lead to significant deviations that may not follow the asymptotic predictions of the model. This could happen when inward-looking groups, initially ignored by the ROTW, start to have an increasing impact over time. However, such persistent and inward-looking groups may demonstrate strong internal inertia, as long as they are not entirely ignored by the ROTW and exert significant influence over it. This finding is consistent with some existing research on political and academic persuasion (DeMarzo et al. 2003).

In the post-World War II historical context, a small communist group led by Walter Ulbricht assumed leadership of the SBZ and later the GDR, highlighting the tension between the new leading political culture and opposing ideologies held by a large majority of Hitler sympathizers. The early GDR elite not only represented this new political culture but also formed the essential communication class in a mathematical sense. The Wandlitz estate, located on the outskirts of Berlin and where the GDR Politburo established itself, exemplifies the isolation of this dominant culture. Although it could influence ROTW, it remained relatively insulated from external influences at the local, intellectual, and political levels. This aloofness ultimately allowed the group to shape the political culture without being swayed by opposing ideologies.[12]

The convergence

In this section, my goal is to clarify whether individual dynasties' traits reach a stable long-term equilibrium and whether the convergence process is the same for all dynasties. Specifically, I investigate if there is a limit that applies to all dynasties and how the social network affects the convergence process towards this limit.

To establish the conditions under which the initial loyalties converge to a stable long-term equilibrium, I begin with the conditions for convergence to a steady state. This means that political loyalties settle into a steady state, but not necessarily that a consensus is reached. To ensure convergence in the standard DeGroot model, cyclic dynamics that arise from aperiodic transition matrices with self-loops must be excluded. The relationship between primitivity and aperiodicity is established in Theorems 2 and 3, along with the corresponding lemmas in Golub and Jackson (2010, p. 137). In this modified DeGroot version, it is crucial to clearly separate the social network and the role of imperfect empathy. To achieve this, I formulate the two parental utility components, v_i and u_i, as quadratic loss functions that parents seek to minimize. The own utility component is described by the following function:

$$u_i(\phi_i^d(t) \mid \phi_i(t)) := -\alpha_i(\phi_i^d(t) - \phi_i(t))^2 \qquad (8)$$

and the inter-generational utility component be given by:

$$v_i(\phi_i(t+1) \mid \phi_i(t)) := -\beta_i(\phi_i(t+1) - \phi_i(t))^2 \qquad (9)$$

To address the issue that neither the custodial state nor children can directly observe citizens' genuine political allegiance to socialism, I introduce imperfect-empathic preferences of parents back into Equation 2. This implies that parents strive to maximize their utility when their children become exact copies of themselves. However, during the transition from Hitler's Germany to the Soviet-led occupation zone or GDR, it seems quite implausible that such utility maxima would have been permitted. Instead, the new political elite took an active role in transforming society, for instance, through vigorous denazification policies or preferential access to resources for "members". In this model, this transformation is accomplished by manipulating the intergenerational utility component to rapidly alter the population's mentality. The GDR, dubbed a custodial dictatorship by dissident Rolf Henrich[13], achieves this by decreasing the degree of imperfect empathy of parents by a factor π, where π is a real number between 0 and 1. I assume that each adult i minimizes the cost function, as shown below, where α_i and $\pi_i = \beta_i - \pi > 0$ for all $i \in N$:

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[12] The aloofness of the political elite in Wandlitz may have resulted from disinterest or ignorance, but this detail does not diminish the significance of examining the relationship between dynasties and political culture. In essence, it underscores how the dominant political culture can shape the broader population and demonstrates the possibility of one-way influence in such circumstances.

[13] See Henrich (1989).

$$J_i(\phi_i^d, \phi_i(t+1)) = \frac{1}{2}\alpha_i(\phi_i^d(t) - \phi_i(t))^2 - \frac{1}{2}(\beta_i - \pi)(\phi_i(t+1) - \phi_i(t))^2 \tag{10}$$

Equation 10 shows the parental optimization problem, which satisfies the conditions of continuity, twofold differentiability, and additive separability as outlined above. The parameter α_i represents the cost that parents incur when their characteristics deviate from their true values, while β_i measures the strength of the parental socialization incentives. The custodial dictatorship seeks to influence these incentives through π, which represents the reduction in the degree of imperfect empathy. To simplify the model, I set $\alpha_i = 1$ and allow β_i to reflect the relative weight of parental imperfect empathy, which is influenced by state incentives. It is assumed that these incentives are imperfect and that socialization incentives are present, meaning that $(\beta_i - \pi > 0)$.

The assumption that $(\beta_i - \pi > 0)$ is critical in this model, and its significance can be understood by considering the opposite scenario, where $(\beta_i - \pi \geq 0)$. In this case, there would be no socialization incentives in the extreme scenario, as the parental imperfect empathy would not be mitigated by the custodial state's intervention. Consequently, the model would reduce to a pure coordination game with continuous payoffs, where each individual's publicly displayed political loyalty would coincide with their true loyalty. I consider a synchronous version of the game where adults can observe a child's level of political loyalty at any given time and use it as a basis to build their cost function. The cost function results from the cognitive dissonance between the true and publicly displayed political trait to the state socialist society and must be minimized. This synchronous version of the game better captures the reality of the custodial state, where the state actively shapes citizens' political attitudes and behavior through interventions such as denazification policies or privileged access to resources.

There are two important considerations to explore further. Firstly, introducing a custodial state with incentives can lead to an immediate jump in convergence and a quicker consensus. However, heterogeneity is still preserved, resulting in variations in convergence rates. Secondly, dictatorships face a cost-benefit trade-off when deciding on specific punishments, such as limiting professional and educational opportunities. The GDR is an example where such punishments had a significant and long-lasting negative impact on economic development and society. In this model, the cost and financing of punishments are theoretically ignored, implying a soft budget constraint at the local level, which makes statements about fiscal incentives redundant. It is important to note that the cost-benefit trade-off varies depending on the specific circumstances of the society. While financing punishments through expropriation of dissidents' assets may result in cost-neutral financing, its long-term impact on the society should not be overlooked.

In order to determine whether traits converge or oscillate, it is necessary to formulate the conditions for consensus or dissensus. When quadratic utility functions are used, the political loyalties displayed by individuals can be given by the linear expression $\phi_i^{d^*}(t)$, which represents the best response of their parents. These loyalties can be calculated in the unique Nash equilibrium as $\Phi^{d^*} = (I + \Pi\Psi)^{-1}(I + \Pi)\Phi(t)$, where I is the $n \times n$ identity matrix and Π is a diagonal matrix with entries $\pi_i\psi_{ii}$ in its i-th row. The expression for Π is derived from the condition that $(\beta_i - \pi)(\sigma_{ii} - \psi) = \pi_i\psi_{ii}$ for all $i \in N$, where β_i represents the weight that individual i places on their own true political loyalty, π_i represents the cost of publicly displaying a loyalty that is different from one's true loyalty, σ_{ii} is the expected cost that individual i believes they will face if they are caught not displaying the politically correct loyalty, and ψ is the weight that individuals place on the political loyalties of others.

To demonstrate the invertibility of $(I + \Pi\Psi)$, it must first be shown that Ψ is symmetrically positive definite. To prove this, it is necessary for $(I + \Pi\Psi)$ and $(I + \Pi^{\frac{1}{2}}\Psi\Pi^{\frac{1}{2}})$ to have the same eigenvalues. As Ψ is already symmetric, $(\Pi^{\frac{1}{2}}\Psi\Pi^{\frac{1}{2}})$ is also symmetric. Since $\Pi \geq 0$, $\Pi^{\frac{1}{2}}\Psi\Pi^{\frac{1}{2}}$ is positive semidefinite as soon as Ψ is positive semidefinite. Therefore, $\Pi\Psi$ has non-negative and real eigenvalues, leading to all eigenvalues of $(I + \Pi\Psi)$ being nonzero. This outcome guarantees the invertibility of $(I + \Pi\Psi)$ and allows for the existence of $\Phi^{d^*} = (I + \Pi\Psi)^{-1}(I + \Pi)\Phi(t)$. The law of motion further indicates that $\Phi(t+1) = M\Phi(t)$. As a result, M can be described by:

$$M := \Psi(I + \Pi\Psi)^{-1}(I + \Psi) \implies \Phi(t) = M^t\Phi(0) \tag{11}$$

Demonstrating the symmetry and positive definiteness of Ψ guarantees the invertibility of $(I + \Pi\Psi)$ and enables the calculation of the matrix M through the existence of $\Phi^{d^*} = (I + \Pi\Psi)^{-1}(I + \Pi)\Phi(t)$. As observed in the analysis

of two dynasties, the traits of communist dynasties converge, implying that M must solely consist of positive entries to prevent trait divergence.[14]

The transformation from the property vector $\Phi(t)$ to $\Phi(t+1)$ over M is independent of $\Phi(t)$, which means that the dynamics can be described by the power sequence M^t. Specifically, this results in $\Phi(t+1) = M \times \Phi(t) = M^2\Phi(t-1) = M^{t+1}\Phi(0)$. The linearity of M is implied by the quadratic utility function utilized in the parental optimization problem. To link to the DeGroot model, note that $\Phi(t+1) = G\Phi(t) = G^{t+1}\Phi(0)$. A custodial dictatorship can transform the DeGroot matrix G into M, which are both Markov matrices. When the custodial state does not affect the imperfect empathy and parental socialization success shares, $M = G$, and this corresponds to the standard case described in DeGroot (1974).

To summarize, the convergence conditions for the trait formation dynamics can be fully determined based on four components. These include the social network represented by the matrix Ψ, which is made up of the parental socialization success σ_{ii} minus the effectiveness of state indoctrination ψ. In addition, the conditions under which the custodial dictatorship operates must also be taken into account, such as how successfully the imperfect-empathic preferences of the dynasties β_i are reduced by the custodial state's influence parameter π. Furthermore, the use of a quadratic utility function provides a unique framework for studying the effects of these exogenous parameters on the trait formation dynamics. This quadratic function allows for the examination of how changes in the network structure and the custodial state's influence affect the convergence of the dynasties' traits. Thus, the initial convergence conditions can be summarized as follows:

Proposition 4 (Convergence part I) *Under the given parental optimization problem in Equation 10, the following conditions hold:*

   (i) *If Ψ is a positive definite symmetric matrix, then for any $(\beta_i - \pi) \in \mathcal{R}+^n$, the sequence $\Phi^*(t) = M^t\Phi(0)t \to \infty$ converges to a steady state for an arbitrary $\Phi(0)$.*

   (ii) *If there exists a non-singular Ψ with an eigenvalue λ such that $\Re(\lambda) < |\lambda|^2$, then there is a $(\beta - \pi) \in \mathcal{R}+^n$ for which the spectral radius of M is strictly greater than 1. Thus, the sequence $\Phi^*(t) = M^t\Phi(0)_{t \to \infty}$ oscillates without convergence.*

Proposition 4 sheds light on the convergence properties of political loyalties. Part (i) of Proposition 4 establishes the sufficient conditions for convergence of the transition matrix M in terms of the symmetric positive definiteness of the social network matrix Ψ. In particular, convergence is achieved if all eigenvalues of M lie in the open interval $(0, 1]$. Moreover, Part (i) implies that the traits of individuals in period $(t + 1)$ depend on those in the previous period t, and convergence is guaranteed as long as the parental socialization successes exceed those of the social environment. Conversely, when the opposite holds, traits will oscillate. This scenario is plausible in the case of a pervasive custodial dictatorship where parents have less influence on their children than the social environment, as demonstrated by the emergence of far-right youth subcultures in anti-fascist societies in the early 1980s. Part (ii) of Proposition 4 extends the analysis to non-symmetric positive definite matrices and specifies that the real part of any eigenvalue must exceed the squared absolute value of that eigenvalue. To see this, assume that Ψ is symmetric, which efffectively reduces $\Re(\lambda) < |\lambda|^2$ to $\lambda \geq \lambda^2$, with λ taking on values in the close interval $\lambda \in [0, 1]$. Since symmetric matrices only have real eigenvalues, for symmetric and non-singular matrices like Ψ, algebraic and geometric multiplicities coincide, leading to the following corollary:[15]

Corollary 1 *Convergence in political loyalties is achieved if and only if Ψ is positive definite.*

In contrast, political loyalties diverge when imperfect-empathic preferences are highly prevalent, and the eigenvalue definition is not satisfied. This occurs when the intergenerational utility is significantly prioritized, resulting in political loyalties oscillating instead of converging. To attain convergence in the current model, the transformation matrix M can be used if Ψ is aperiodic, which is necessary in the standard DeGroot model. The incentives offered by the custodial state π effectively decrease the impact of imperfect-empathic preferences β_i.

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[14] Nonetheless, negative entries are conceptually intriguing, as they capture negative inter-dynasty relationships where a dynasty negatively evaluates a peer's behavior despite positive weighting of their opinion. Despite the conceptual interest in negative entries, I focus on the standard convergence results and abstain from investigating the case of negative entries in the matrix M.

[15] If $\phi_i(t+1) = \Psi^t\phi_i(t)$, true political loyalties $\phi_i(t)$ converge if and only if Ψ^t converges. Additionally, displayed loyalties $\phi_i^d(t)$ converge if and only if true loyalties converge. If both converge, then the limits coincide.

To achieve the convergence of political loyalties, it is crucial to focus on the graph structure $\mathcal{G}[\Psi]$ rather than on individual weights. This implies that the model will only converge if all essential communication classes in $\mathcal{G}[\Psi]$ exhibit aperiodic behavior and do not show any cyclic dynamics. The consensus is established only when $\mathcal{G}[\Psi]$ is quasi-strongly connected and has a directed spanning tree where the only essential communication class is aperiodic. This outcome can also be derived from standard Markov chain convergence results by using the duality between Markov chains and the DeGroot model. If there is a multidynastic setup with positive socialization outcomes such that $\sigma_{ii} - \psi < 0$ for all i, the model will converge, and consensus will be achieved based on the quasi-strong connectedness of $\mathcal{G}[\Psi]$. However, it is important to note that the existence of a directed spanning tree is not sufficient for consensus if Ψ has zero diagonal entries (Harary 1959; Harary et al. 1965).

In contrast to the classical DeGroot model, the present model achieves convergence and consensus within essential communication classes. However, political loyalties may still diverge in regions outside these classes. For instance, if the dynasty's specifications result in very high eigenvalues such that $|\lambda_{\mathcal{RR}} > 1|$ for $M_{\mathcal{RR}}$, convergence in all essential communication classes, which are defined as closed and strongly connected groups, does not ensure convergence for regions outside these classes. In order to ensure convergence in these regions, specific conditions must be defined so that M^t converges.[16] To following proposition shall be used for this purpose:

Proposition 5 (Convergence Part II) *Consider the parental optimization problems given by Equation 10. Let Ψ be an irreducible matrix, implying that the associated graph $\mathcal{G}[\Psi]$ is strongly connected and has strictly positive diagonal elements. Then, the size of the neighborhood around $(\beta - \pi) = \mathbf{0}$ is determined by the modified social network Ψ. More specifically, there exists a set $N(\mathbf{0} \mid \Psi) \in \mathcal{R}^n_+$ such that for any $(\beta - \pi) \in N(\mathbf{0} \mid \Psi) \cup \mathbf{0}$, the political loyalties in the society will converge to $\Phi(t)$, irrespective of the arbitrarily chosen initial state $\Phi(0)$. This result holds even in the presence of imperfect empathy among parents, as long as the conditions for convergence within and outside the essential communication classes are met.*

Proposition 5 establishes that political loyalty convergence depends not only on initial conditions but also on the network structure $\mathcal{G}[\Psi]$. The convergence neighborhood size is determined by the modified social network Ψ, which captures the interplay between individual preferences and the incentives provided by the custodial state π. The irreducibility of Ψ ensures that information and opinions can spread across the entire society, while the positive diagonal elements guarantee that each dynasty has a non-zero self-influence. This prevents the consensus state from being dominated by any single dynasty or group. If the diagonals of Ψ are strictly positive, then Ψ has a simple Perron-Frobenius eigenvalue of 1, with all other eigenvalues either above 0 or below 1. This implies that the absolute eigenvalue of Ψ is in the interval $(0, 1)$. Since all eigenvalues are continuous, Ψ can be perturbed to ensure that M^t also has an absolute eigenvalue of 1 and all other eigenvalues lie in the interval $(0, 1)$, implying convergence of M^t. The assumption of positive diagonals is necessary for ensuring the aperiodicity of Ψ.

The adapted DeGroot model achieves political loyalty convergence through low parental imperfect-empathic preferences $(\beta - \pi)$ and the specific structure of the adjusted matrix Ψ. This result is attained by the socialist state planner through sufficiently large mobility incentives that reduce parental utility loss from a child that is too different, as well as an effective indoctrination system in the schooling framework that tips parental socialization success towards collective socialization. These conditions are weak but demonstrate the elegant simplicity of the approach.

Taken together, Propositions 4 and 5 provide answers regarding convergence and consensus, while highlighting the importance of the social network structure as a strongly connected graph. These propositions also suggest the need for confirmation of convergence and consensus in the absence of a small-world network. Furthermore, the consensus is determined by the linear combinations of initial political loyalties of the model dynasties, weighted by the network centrality of these dynasties (Golub and Sadler 2016, p. 20). The last point in particular highlights what is probably the most interesting connection between a DeGroot updating process and the network structure in which the model dynasties communicate with each other.

The persistence

Upon establishing the necessary convergence conditions, I will investigate the asymptotic behavior of traits, taking into account the initial loyalty profile $\Phi_i(0)$, and analyzing it over a multi-generational time frame. Specifically, I will

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[16] It should be noted that violating the necessary convergence conditions also occurs when the degree of imperfect empathy of parents in the essential communication classes is too strong.

explore the interplay between a dynasty's initial political allegiance, its position in the social network Ψ, and the ability of the custodial state to alleviate the limitations of imperfect parental empathy, and how they collectively influence the asymptotic traits. For the purposes, I define the "long run" as a time horizon that spans at least two generations. I will present a rigorous formulation of the asymptotic traits under the convergence condition, and subsequently provide an explanation of its historical context.

Theorem 1 (Convergence part III) *Let Ψ and M be matrices organized as shown in 7, and let $w, v \in \mathcal{R}_+^n$ be vectors that satisfy the following conditions: for each essential communication class $L_k \in \mathcal{P}(\Psi)$ and $L_k \in \mathcal{P}(M)$, $w_{|L_k}$ is the left unit eigenvector of M_{kk} with $\sum_{i \in L_k} w_i = 1$, while $v_{|L_k}$ is the left-unit eigenvector of Ψ_{kk} with $\sum_{i \in L_k} v_i = 1$. If Ψ^t converges to some M^∞ as $t \to \infty$, then the following equation holds:*

$$M^\infty = \begin{pmatrix} (\sigma_{11} - \psi)^\infty & 0 & \cdots & \cdots & \mathbf{0} \\ \mathbf{0} & \ddots & \ddots & \cdots & \vdots \\ \vdots & \ddots & \ddots & \ddots & \vdots \\ \mathbf{0} & \cdots & \mathbf{0} & (\sigma_{kk} - \psi)^\infty & \mathbf{0} \\ (\sigma_{\mathcal{R}1})^\infty & \cdots & \cdots & (\sigma_{\mathcal{R}k})^\infty & (\sigma_{\mathcal{R}\mathcal{R}} - \psi)^\infty \end{pmatrix} \tag{12}$$

$$M_{kk}^\infty = \mathbb{1}_{|L_k} v'_{|L_k} = \mathbb{1}_{|L_k} w'_{|L_k} \frac{I - \Psi_{kk}}{\mathbb{1}'_{|L_k}(I - \Psi_{kk})w_{|L_k}} \tag{13}$$

and

$$M_{kk}^\infty = (I - \Psi_{\mathcal{R}\mathcal{R}})^{-1} \Psi_{\mathcal{R}k} M_{kk}^\infty \tag{14}$$

for all $k = 1, \ldots, K$.

Theorem 1 establishes that the long-term dynamics of genuine political allegiances converge to $\Phi(\infty) = M^\infty \Phi(0)$, which is analogous to Theorem 10 in DeMarzo et al. (2003). To provide insight into this result, I differentiate between essential and inessential communication classes, denoted as L_k and $\mathcal{R}$, respectively. It is important to note that while the long-term evolution of political allegiances may differ between groups, each essential communication class L_k, which pertains to a tightly connected and self-contained group, will eventually reach a consensus $l_k \in \mathbb{R}$ as each class Ψ_{kk}^t of Ψ^t converges to a rank-1 matrix. Each row of Ψ_{kk}^∞ corresponds to the left-unit eigenvector $v'_{|L_k}$, implying that:

$$c_k := \phi_i(\infty) = \phi_j(\infty) = v'_{|L_k} \phi(0)_{|L_k} \tag{15}$$

for all dynasties i and j in the essential communication class L_k. The standardised left-unit eigenvector $v'_{|L_k}$ captures the effect of the initial opinion of dynasty i on the consensus among the essential communication class L_k. Therefore, the long-term progression of a dynasty in $\mathcal{R}$ will be governed by the weighted mean of the long-term political loyalties within the essential communication classes $l_1, \ldots, l_K$ with indices $1, \ldots, K$. This can be mathematically formulated as:

$$\Gamma := (I - \Psi_{\mathcal{R}\mathcal{R}})^{-1} (\Psi_{\mathcal{R}1} \mathbb{1}_{|L_1}, \ldots \Psi_{\mathcal{R}K} \mathbb{1}_{|L_K}) \tag{16}$$

which is row-stochastic. Consequently, matrix Γ provides a means to reformulate Equation 14 as:

$$\phi(\infty)_{|\mathcal{R}} = \Gamma l \tag{17}$$

Here, Γ aggregates the long-term political loyalties of the K essential communication classes into a $n \times K$ matrix, and $l = (l_1, \ldots, l_K)'$ represents the vector of long-term political loyalties within these classes. In contrast, the initial political loyalty of a dynasty in the inessential communication classes (i.e., ROTW) does not impact the long-term loyalty profile since they ultimately obtain an average of the political loyalties displayed by dynasties in the essential communication classes. Additionally, the weighting of dynasties in ROTW for averaging depends on Ψ but not on the level of parental imperfect empathy. Hence, the long-term political loyalties of dynasties in ROTW are unaffected by their initial loyalties and their parents' imperfect-empathic preferences. When there is more than one essential communication class, dynasties in ROTW may have varying averages of the approval characteristics of different closed and strongly connected groups, and they may not necessarily reach a consensus. The primary contribution of the theorem, including its proof presented in DeMarzo et al. (2003), lies in the characterization of v' as a function of w' and Ψ. In this model, trait convergence is solely observed among dynasties in the essential communication classes,

whereas dynasties in ROTW will exhibit heterogeneous characteristics in the long term. Therefore, this model is particularly suitable for modelling the initial scenario in the SBZ, from which the GDR emerged in 1949. In the subsequent section, I will elucidate the implications of the results in the context of the historical case.

For practicality, imagine a group of individuals from a region that was previously under a dictatorship with a certain ideology (denoted by F). After the fall of the dictatorship, they "migrate" to a new country with a completely different political system based on socialist principles and anti-fascist ideology (denoted by A). However, mental models and beliefs are still influenced by previous dictatorship socialization. This migration and the resulting clash of political ideologies can be interpreted as the clash of old and new political "Leitkulturen" (leading or guiding cultures) in different social environments. Within the new country (A), there is a social network (Ψ) where representatives from both the old (F) and new (A) political systems interact. This social network can be divided into different communication classes, with five classes being assumed in this case (L_1, L_2, L_3, L_4, and L_5). The first two communication classes, L_1 and L_2, represent the essential communication classes of the new state, while the remaining classes (L_3, L_4, and L_5) are inessential. All individuals from the previous dictatorship system (F) are assumed to be part of the L_4 communication class, i.e., $F \cup L_4$.

At the start of the interaction in the L_4 communication class, individuals with mental stocks influenced by the old F system will interact with those from the new A system. Over time, these individuals are expected to adapt to the new system, but their political loyalties will persist due to the transfer of their mental models from the old leading culture F to the new system A. Interestingly, the opposite is also expected, as some individuals from the new system A are expected to adopt characteristics of the old system F. This convergence of the two types can lead to the erosion of the purist communist value system into a national-chauvinist one. This convergence in political loyalties, which remains heterogeneous in the end, can explain the failure of state socialist anti-fascism and is independent of content, but rather results merely from communication between various dynasties. The partitioning of the social network into communication classes is crucial for this convergence. Additionally, engaged individuals from the new system A can be influenced by individuals from the old system F.

Now, consider the dynamics of a social network consisting of seven dynasties, denoted by the set $N = 1, 2, 3, 4, 5, 6, 7$. The influence that each dynasty has on another dynasty is represented by the relative influence matrix Σ. Assuming that the effectiveness of the central school system's indoctrination is less than perfect, with a value of $\psi = 0.2$, I can represent the social network Ψ as a matrix. The row sum of Ψ is equal to 0.8, and its elements are given as follows:

$$\Psi = \begin{pmatrix} 0.6 & 0.2 & 0 & 0 & 0 & 0 & 0 \\ 0.3 & 0.5 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0.8 & 0 & 0 & 0 & 0 \\ 0.3 & 0 & 0 & 0.5 & 0 & 0 & 0 \\ 0 & 0.1 & 0 & 0.2 & 0.3 & 0 & 0.2 \\ 0 & 0 & 0 & 0.1 & 0.1 & 0.5 & 0.1 \\ 0 & 0 & 0.2 & 0 & 0.2 & 0.1 & 0.3 \end{pmatrix} \tag{18}$$

In this context, Ψ is a square matrix where each row represents the relative influence of a dynasty on the others in the network, while the columns indicate the respective dynasty. The values of Ψ range between 0 and 1, where higher values indicate stronger influences of one dynasty on another. The dynamics of the social network model considered here exhibit a variation in the influence between dynasties, where some have mutual influences while others are influenced only by themselves or a subset of other dynasties. Specifically, dynasties 1 and 2 have a mutual influence, dynasty 3 is influenced only by itself and dynasty 4, and dynasty 4 is influenced only by itself and dynasty 1. On the other hand, dynasties 4, 5, 6, and 7 have connections with each other, and some are influenced by dynasties 2 and 3. These properties enable the classification of the dynasties into four communication classes, $\mathcal{P}(\Psi) = L_1, L_2, L_3, L_4$, where $L_1 = 1, 2$, $L_2 = 3$, $L_3 = 4$, and $L_4 = 5, 6, 7$. Notably, only communication classes L_1 and L_2 are critical since they have mutual influences and represent the dominant political cultures. The remaining communication classes, L_3 and L_4, are insignificant and reflect the ROTW.

In order to model the dynamics of political loyalties, I must specify an initial level of intensity in political loyalties, which I denote as $\Phi(0)$. The initial level is represented by a vector $(100, 95, 0, 110, 20, 85, 0)$, where higher values correspond to greater support for the new socialist regime, and lower values correspond to less support. I emphasize that the dynasties within each essential communication class influence only each other, and are not influenced by any

external factors. Thus, the convergence within each essential communication class occurs smoothly and is achieved particularly when $\sigma_{11} + \sigma_{22} > 1$. However, since dynasty 3 is a singleton and is affected only by the effectiveness of indoctrination, its political traits do not converge. Despite not being influenced by any other dynasty, it still influences other dynasties such as dynasty 7. Based on the initial political scale, dynasty 7 belongs to the F type, and the primary communication classes consist of dynasties with the new A leading culture, having a trait intensity close to 100. Furthermore, L_2 represents the old F-type leading culture. This is reasonable since dynasty 3's trait remains constant and can be interpreted as a completed thought process. Consequently, while dynasty 3 retains its trait intensity, dynasty 7 adapts over time while retaining trait differences. I propose that this scenario can be applied to a situation where a small group of Communists (A-types), of which I am a part, returns from the Soviet Union to take over the government of the future GDR and is confronted with a mass of former party members and Hitler sympathizers, many of whom are needed in the leadership of the new state.

Political loyalties and traits exhibit persistence over time due to network connections, albeit with diminishing differences between individuals as relative positions become more important. The model that depicts the assimilation of traits, as exemplified by the scenario of regime change, proves effective; however, its speed of convergence varies depending on the trait being analyzed. For instance, childhood political socialization necessitates more time to converge to a centrist perspective than other attitudes. To unravel the factors that influence convergence and its pace, I now examine the spectral properties of the transition matrices. Assuming the custodial state's incentives offset the imperfect-empathic preferences of parents, the transition probability is contingent on whether I have a linear or quadratic utility function, with Ψ^t or M^t determining the outcome when $\beta_i = 0$ and $\Psi = M$ for each $i \in N$.

The Perron-Frobenius theorem further dictates that both matrices have 1 as their largest eigenvalue, with their convergence rate determined by the second-largest eigenvalue. By ordering the eigenvalues by magnitude, I obtain the following sequence for Ψ: $|\lambda_1(\Psi)| \leq |\lambda_1(\Psi)| \leq ... |\lambda_n(\Psi)|$, and similarly for M: $|\lambda_1(M)| \leq |\lambda_1(M)| \leq |\lambda_n(M)|$. It is worth noting that irreducible matrices always have a single largest eigenvalue that is real and positive, thereby transforming the inequalities between the matrices into strict inequalities with all eigenvalues represented by their absolute values. When the second-largest eigenvalue in M exceeds that of Ψ, i.e., $|\lambda_2(M)| > |\lambda_2(\Psi)|$, M^t converges at a slower rate than Ψ, where parental socialization incentives are absent.

In practical terms, when there are no incentives for parents to influence their children's political views, individuals will publicly express their genuine political beliefs. This results in a society of truthful socialism "brokers." However, when β_i is positive, matrix M approaches eigenvalues of 1 due to dynasties investing more in preserving their true convictions. Nonetheless, excessive investment in socialization can hinder convergence in political loyalties, ultimately limiting cultural change to an arbitrary extent. Consequently, a custodial state can only mitigate the loss of utility parents experience due to their children's diversity by adjusting two "screws" in its system. The model demonstrates that state intervention can expedite the convergence to a new social and cultural equilibrium. However, state intervention also disrupts cultural change by diminishing the success of parental socialization, which can cause overshooting of cultural characteristics unless the diagonal elements of matrix Ψ are strictly positive. In essence, this conclusion can be formulated as follows:

Proposition 6 (Speed of convergence to a new cultural equilibrium) *Consider the parental socialization problem as defined in Equation 10. Assume that the symmetric matrix Ψ has positive β_i for all $i \in N$. In this case, the rate of convergence of political loyalties in $\Phi(t)$ as $t \to \infty$ is determined by the real and positive eigenvalues of the matrix M. These eigenvalues satisfy the strict inequality $|\lambda_k(M)| > |\lambda_k(\Psi)|$ for all $2 \leq k \leq K$. Thus, the state can increase the speed of convergence towards a new cultural equilibrium by modifying the parental socialization incentives β through a policy π. Moreover, when all β_i tend to zero, all the eigenvalues of M tend to zero, which indicates that the convergence in political opinions can become arbitrarily large for sufficiently high mobility incentives π. This implies that the custodial state can facilitate a rapid convergence to a new cultural equilibrium by providing high mobility incentives for individuals, even in the absence of parental socialization incentives.*

The Proposition 6 posits that a centralized school system implemented by a custodial state to indoctrinate its citizens can promote convergence towards a new cultural equilibrium. This is contingent on the assumption that parental socialization weights are positive, which precludes oscillatory dynamics. Additionally, greater incentives for social mobility reduce parental imperfect-empathic preferences, thus preventing overshooting in loyalties and leading to a faster convergence in political loyalties. As a result of these interventions, dynasties within essential

communication classes can reach a consensus and share the same political loyalties, while heterogeneity prevails in the ROTW. However, the transition matrix M^t implies that long-term traits are a convex combination of initial traits, which means that an "engineering of consent" towards a truly antifascist society is impossible in this model. This suggests that even with centralized indoctrination efforts and increased social mobility incentives, a fully antifascist society cannot be engineered through this method.

3.3.5. Summary

I have shown that even non-Bayesian actors can reach a consensus, which helps prevent sustained dissent and limits the spread of "misinformation." In this model, actors can gain social advancement by concealing their true loyalties to the political system, turning the opinion formation process into a local interaction game within a social network. When dynasties have perfect empathy, their best response converges to a common trait, and the influence of each dynasty's initial opinion is proportional to its centrality in the network. However, if dynasties have imperfect empathy, they fail to reach consensus, and the opinion dynamics converge to a unique equilibrium where each dynasty's stated traits are a convex combination of their initial traits. The coefficients of this combination are determined by matching probabilities of a random walk over the network. The speed of consensus depends on factors like the actors' network centrality, intergenerational mobility, and the graph's properties.

These convergence criteria have a significant and lasting impact on the modeled society. They result in a social network divided into influential classes, which enables the modeling of a political socialist elite that shapes political loyalties across the broader socialist social order. However, when a regime transitions from fascism to socialism, mental stocks from the previous regime are transferred to the new regime through inter-dynasty interactions, despite a complete reversal in the incentive structure. Socialization in pre-communist regimes can influence staunch communist dynasties in the opposite direction across generations, leading to a less polarized society. Nationalist and chauvinist attitudes still exist within a broad section of society, and costly signals are necessary to access elevated positions. Over time, this leads to a highly homogeneous social structure that reproduces class characteristics.

3.4. Historical background II – The late GDR

The rise of right-wing extremism in the late 1980s and early 1990s can be partly attributed to the GDR leadership's ban on discussing fascism during their socialist regime. The GDR's official ideology combined communist beliefs with "prime German" values and mentalities that had survived under the cheese bell of "socialism in the colors of the GDR"[17], leading to degenerate developments that were only revealed to the population shortly before the GDR's collapse. Therefore, the spread of racist attitudes and actions in the late 1980s and early 1990s in both the GDR and unified Germany, especially in East Germany, should not have come as a surprise. This section aims to provide further insight into the GDR's anti-fascist policies, building on the historical background presented in Section 3.2.

3.4.1. Skins and Faschos

Historian Harry Waibel has documented approximately 8,600 cases of racist or anti-Semitic propaganda and violence in the GDR (Waibel 2014, p. 19).[18] These incidents were reported in the GDR press but were reinterpreted as the activities of "fascist saboteurs" from the Federal Republic of Germany (FRG) after the construction of the "anti-fascist wall" in 1961 and the abandonment of all-German ambitions. Racist violence increased in the 1970s, particularly in the soccer hooligan scene, and temporary racist sentiments were expressed at soccer matches (Müggenburg 1996, p. 25; Siegler 1996, p. 617). The skinhead scene also propagated animosity towards various groups, including but not limited to foreigners, punks, goths, Jews, churchgoers, and homosexuals (Ködderitzsch and Müller 1990, p. 12).

In the early 1980s, the East German skinhead community underwent radicalization, which peaked with a documented attack by thirty skinheads on a punk concert by the band "Element of Crime" at the Zion church in Berlin on October 17, 1987 (Stöss 2010, p. 108). Although the police were watching the church, they did not intervene, and the

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[17] SED General Secretary Erich Honecker used this expression on December 29, 1988, on the occasion of the 70th anniversary of the founding of the KPD. It is considered a rejection of Mikhail Gorbachev's reform course, which was embodied by the terms perestroika ("transformation") and glasnost ("openness"), as well as the reform approaches of Poland and Hungary.

[18] It should be noted that right-wing extremist networks existed within GDR security organizations, such as the National People's Army (NVA) and the People's Police (VP) (Siegler 1991, p. 99).

skinheads attacked other passersby. Subsequently, twelve people were charged and convicted of robbery and rioting. The attack featured slogans such as "Sieg Heil" and "Jews out of German churches," revealing the anti-Semitic and neo-fascist ideologies present in certain sections of the skinhead community, and the state's failure to control such movements (Menhorn 2001, pp. 157). This event marked the end of the censorship of neo-fascist and anti-Semitic reporting. Reports of the attack brought to light the state of affairs in the skinhead community and the government's incapability of dealing with them.

Recruits for the neo-Nazi movement in East Germany during the 1980s and early 1990s came from diverse groups, including conscripts, hooligans, and disillusioned youth who were attracted to the glorification of soldierly masculinity and a penchant for violence. The skinhead and organized Nazi structures shared similar self-images that were based on survivalist ideals, a propensity for violence as a social technique, unpredictability in social behavior, and a sense of disillusionment that emerged from past experiences. It is worth noting that the movement was not limited to marginalized youth. Middle-class and working-class individuals who prioritized physical fitness, possessed strong willpower, and distinguished themselves from other groups, such as the "smut and booze punks" (*Schmuddel- und Saufpunks*), were also involved (Siegler 1991, p. 74). Many skinheads pursued employment and some were recognized for their strong work performance in work collectives (Niederländer 1987, p. 39; Brück 1992, p. 44). Therefore, the right-wing extremist movement during this time was not exclusively composed of socially isolated individuals but also included those who were part of the real socialist social order in the GDR (Bergmann and Erb 1994).[19]

3.4.2. Xenophobia

The treatment of foreigners in the GDR, particularly foreign contract workers, reveals latent ethnocentrism and xenophobia (Broszinsky-Schwabe 1990). As of 1989, there were 191,000 foreigners living in the GDR, with 40,000 of them being permanent residents as spouses of GDR citizens or refugees from other "brother" states. The majority, approximately 90,500, were contract workers who arrived in the GDR under bilateral agreements with governments such as Poland, Bulgaria, Hungary, Algeria, Cuba, Mozambique, and Vietnam in the 1970s and 1980s. These workers were mainly concentrated in industrial districts such as Dresden, Karl-Marx-Stadt (now Chemnitz), Berlin, Leipzig, and Halle (Marburger 1993, p. 4 & 9) and were often subjected to discrimination and mistreatment due to their foreign status (Waibel 2014, p. 538).

The GDR imposed a variety of restrictions on contract workers, such as a maximum stay of 4 or 5 years, payment of 12% of their wages to their home country, age limits between 18 and 40 years, and prohibition of family reunification. In addition, they faced compulsory membership in the "Free German Trade Union Federation, FDGB," which required payment of dues, and deportation in the case of pregnancy (or forced abortion) and political activity (Waibel 2014, p. 13). The GDR did not intend for these workers to integrate, actively preventing it by requiring them to live in gender-segregated company-owned dormitories. Workers shared small rooms with up to three other people and underwent regular nightly inspections, with management holding keys to all rooms and the authority to conduct searches at any time (Siegler 1991, pp. 138 – 150; Müggenburg 1996, p. 18).[20] In the 1980s, as the GDR faced social and economic stagnation, the SED leadership exploited popular resentment and directed it towards contract workers, who were seen as having access to scarce goods. Thus, two contrasting attitudes towards foreigners coexisted: the official ideology of solidarity and friendship between peoples and a social hostility towards foreigners. The SED repeatedly emphasized in bilateral treaties with the countries of origin that foreign workers were to return to their home countries after five years, which contributed to the aggression of the local population towards them. After the fall of the Wall, many foreigners entered the new federal states, which were legally obliged to accept a certain quota of asylum seekers at the end of 1990, despite the widespread expectation that foreign workers would quickly leave the country (Bergmann and Erb 1994, p. 89).

3.4.3. Anti-Semitism

Anti-Semitism in the GDR can best be described as "anti-Semitism without Jews." This was expressed through the GDR's implementation of anti-Zionist policies towards Israel, as well as its own anti-Semitic policies towards the

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[19] To illustrate, Thomas Dienel, who had a prior record of convictions and formerly held a position as an FDJ secretary, played a role in arranging the Rudolf Hess memorial march in Rudolstadt in 1992. The march was attended by approximately 2,000 neo-Nazis from different regions of Germany, including members of the "National Socialist Underground" (NSU) (Quent 2016).

[20] See also Poutrus et al. (2000) and Waibel (2014).

Jewish community and its institutions. Before World War II, around 85,000 people of Jewish origin lived in the GDR or SBZ. However, after 1945, only a few hundred Jews remained, most of whom had survived Nazi concentration camps or returned to Germany from emigration. The remaining Jewish population included citizens who were organized in congregations, as well as those who identified as socialists, communists, or anti-fascists but did not have religious affiliations (Waibel 2014, pp. 82).

In February 1949, the SED Politburo addressed anti-Semitic sentiment in Berlin and within the party. This led to the Central Party Control Commission's anti-Semitic "purges" in November 1949, which affected mostly young people in high-ranking positions in the party leadership or journalism (Timm 1997, p. 113). In January 1952, the Soviet occupying forces instructed the SED leadership to register all Jewish members in a special card index, and in July 1952, their property was transferred to national ownership (Groehler and M. Kessler 1995, p. 14).[21] However, the remaining GDR Jews and their organization, the "Association of Jewish Communities in the GDR" [*Verband der Jüdischen Gemeinden in der DDR*], were not permitted to express criticism in public about domestic or foreign political events. As their interest group was officially classified not as a religious community but explicitly as a political organization, criticism of social anti-Semitism or the government's anti-Zionist foreign policy was only allowed in internal discussion circles (Waibel 2014, pp. 82).

The SBZ and GDR both exhibited persistent social anti-Semitism, which took various forms, including the destruction of Jewish graves in many communities and towns from 1946 onwards (M. Schmidt 2007). This was also apparent in the use of inflammatory slogans and graffiti that glorified Nazi fascism and the Holocaust. The Ministry of the Interior (MdI) reported a total of 595 incidents of anti-Semitic agitation and 2,977 neo-fascist incidents to the SED Politburo in 1960 (Timm 1997, p. 422). The GDR's foreign policy was also strongly anti-Semitic towards a non-existent population. The SED defined its policy towards Israel, the Arab states, and the Palestine Liberation Organization (PLO) as anti-Zionist, in line with its Moscow counterpart, as part of the fight against imperialist and colonialist domination. This stance was expressed in the Council for Mutual Economic Assistance (CMEA) alliance with the Arab states (Poliakov 1992, pp. 15; Waibel 2014; Medwedew 1984). The outbreak of the Six-Day War in 1967 led to the emergence of anti-Zionism as latent anti-Semitism in all legal and subversive organizations of the authoritarian German left in both German states. This anti-Zionist argument ties in with an incomplete ideological reappraisal of Nazi fascism in both German states before reunification, resulting in a mass suggestion that Israelis were either similar to or worse than Nazis (Waibel 2014). This ideological stance was systematically enforced in the GDR by Albert Norden, who oversaw the mass media and imposed this "language regulation" on all editorial offices in the GDR (Wolffsohn 1995, p. 202).[22]

During its final years, the socialist system in the GDR unintentionally fostered the growth of right-wing extremism. Despite claiming to be anti-fascist, the GDR's policies did not create a truly democratic and anti-fascist society. Instead, conformity, harmony, and community were prioritized, which further marginalized non-conformists and promoted discrimination against groups like Jews and migrants. The GDR's policies also inadvertently enabled right-wing extremist youth to exploit subtle tendencies in the system. For instance, the GDR placed significant emphasis on German history and rehabilitated figures who had been previously considered reactionary, promoting a form of national chauvinism that contradicted its official slogans of friendship. It would, however, be unfair to solely blame the GDR for the rise of right-wing extremism, as the Federal Republic of Germany (FRG) also had its negative aspects (Madloch 2000).[23]

3.5. Conclusion

I explored the economic and political factors that led to the growth of right-wing attitudes in the late GDR, despite the state's claim to be anti-fascist. I used a formal theory that considers mental stocks, anti-fascism as an information source, and social networks to understand the persistence of cultural traits over time. The goal was to identify effective

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[21] In connection with the anti-Semitic Slansky trial in Prague in early 1953, more than 400 East German Jews now fled to the West to escape Soviet anti-Semitism.

[22] Albert Norden was a member of the KPD, fled in 1933 and later became chief propagandist of the GDR. As such, he steered anti-Zionist and even anti-Semitic campaigns – even though he himself was Jewish and his father, a rabbi, had perished in a concentration camp.

[23] During the 1960s, the FRG was primarily focused on rebuilding and achieving an "economic miracle," which led to individuals involved in unlawful activities regaining positions of power in politics, administration, academia, and the legal system, which are now celebrated as indispensable factors for the success of the FRG (Bisky 2005, p. 110).

interventions that a social planner could make in a specific context, taking into account network characteristics and other critical factors. The model balances simplicity with thoroughness, providing a comprehensive historical account. Unlike empirical studies that assume a uniform effect of communism, my model examines the reinforcing and mitigating factors to understand how the success and failure of communist exposure varied across different generations. In essence, the model provides a theoretical framework for understanding the impact of regime changes (Pop-Eleches and Tucker 2017, p. 61).

While the present model offers an approach to modeling incentives under communism, it is important to note that other factors that either reinforce or mitigate this model exist. Although East Germans display distinct preferences from their Western counterparts, this finding cannot be generalized to other Eastern European regions due to the unique nature of the GDR's commitment to communism compared to its neighbors. The GDR and Romania underwent a brief period of transitioning to communism from 1945 to 1948, followed by a lengthy period from 1949 to 1962 of Stalinist rule marked by strict adherence to communist ideology and repressive measures. In the early 1970s, the GDR shifted to neo-Stalinist policies, which were more moderate than the previous period but still maintained a hardline stance. Dissent was not tolerated in the GDR, and the state security apparatus was highly active, fostering a culture of repression. On the other hand, Poland and Hungary adopted more relaxed policies towards dissent (Pop-Eleches and Tucker 2017, p. 51).

Although the DeGroot model is vital in studying opinion formation processes, its assumptions have limitations. These limitations include myopia and rationality boundaries, as well as the particular functional form, underlying beliefs, and best response assumptions that are subject to scrutiny. Thus, it is important to consider whether individuals genuinely act based on these assumptions. While the DeGroot model provides a fairly complete understanding of opinion formation, more robust mathematical tools are required to investigate the rates of convergence that lead to the long-run distribution of characteristics. Future research can address the limitations of the DeGroot model:

1. The model assumes that all actors eventually adopt "correct" beliefs and traits due to an asymptotic learning process. However, this overlooks the possibility of false beliefs persisting or becoming entrenched over time. To model indoctrination more realistically, an adaptive extension could be developed that incorporates a range of tools used by political movements or the state beyond schooling and upward mobility incentives.

2. The DeGroot model treats social networks as an exogenous construct, with size and structure remaining unchanged. This is a general flaw because networks tend to evolve. Recent research has explored changes in network structure, such as dynasties with "general characteristics" and endogenous changes. Therefore, it would be interesting to explicitly consider changes in network structure.

3. The DeGroot model assumes all agents follow the same general rule of thumb for the formation of opinions. However, the speed with which different sub-societies reach consensus may differ significantly, even if the opinion formation process follows an asymptotic learning process. An extension that allows for long-term changes in the relevant rule of thumb could mitigate the myopic behavior described above. This could involve improving the information infrastructure that provides increasingly accurate information to actors.

The DeGroot model remains a valuable tool for understanding opinion formation and the dissemination of misinformation within societies. It is crucial to comprehend how propaganda and misinformation can spread in some segments of society but not in others, particularly in light of recent events such as the "Stop the steal" campaign and the "Brexit" referendum. Understanding the susceptibility of specific societies or social structures to these influences is vital in designing more resilient and stable communities that are less vulnerable to manipulation by subversive actors. This is particularly relevant in the German context, where there is polarization over the Corona pandemic and the ongoing war in Ukraine, and pro-Russian sentiments in the East have become a concern. Future research can contribute to the development of more effective strategies for promoting the resilience of democratic societies by examining the limitations of the DeGroot model and exploring potential improvements.

3.6. Discussion

Returning to the communist legacy of East Germany discussed in Section 3.1, the fall of the Berlin Wall marked a pivotal moment for the country. It signaled a shift from a dysfunctional GDR to the possibility of unification with

the Federal Republic of Germany (FRG) and the promise of prosperity. While the "Wende" is widely recognized as a moment of significant change, it's essential to note that the influence of the GDR still resonates deeply in present-day unified Germany.[24] The legacy of four decades of economic hardship, an intrusive public sector, and Marxist-Leninist ideology continues to shape the attitudes, mindsets, social practices, and life stories of three generations of East Germans. As a result, transforming East German society is an ongoing process of restructuring and change, rather than merely a transition from one regime to another (Salheiser 2012, p. 134).

The legacy of communism may influence contemporary attitudes among East Germans, but it is important to note that the challenges facing East Germany today were not exclusively inherited from the communist era. While the sociodemographic makeup of society may reflect communism's influence, other factors such as the unemployment rate are likely influenced by both communist and post-communist developments (Salheiser 2012, p. 134; Mau 2019, p. 12). Therefore, proponents of the GDR socialization approach, who attribute the rise of contemporary right-wing extremism in East Germany to the GDR system's "brown origins," may fail to consider the inequality mechanisms contributing to its emergence today (Quent 2016, p. 112).

East Germany's transition to a new, globalized economic era, market economy introduction, and deindustrialization were significant blows by themselves, and while these processes are not unique to Germany, they are particularly pronounced in the East (Mau 2019). As a result, East Germans tend to behave in an authoritarian manner due to their historical background and lack of experience in dealing with people from other cultures. Moreover, they perceive a lower standard of living than their counterparts in the West, and social relations are fragile due to the departure of many young and well-educated people after reunification. This has led to an increased fear of social decline and a pervasive sense of political powerlessness. Therefore, it is crucial to recognize the complexity of the factors contributing to the current situation in East Germany and to develop policies that address the underlying causes of social disadvantage and political disillusionment.

And yet, the still oft-repeated causality linking contemporary East Germans' skeptical and rebellious attitudes to their socialist upbringing is worrisome, especially since it seems rather absurd to attribute similar behavior to West Germans, even though there are comparable examples. As Hensel (2021) notes, there is little attempt to explain why individuals such as Thilo Sarrazin, Attila Hiltmann, Björn Höcke, Alice Weidel, Alexander Gauland and most recently (again) Boris Palmer exhibit such inflammatory behavior and whether this could be due to their West German upbringing, which did not instill the basics of democratic decency.

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[24] The German word "Wende" can be translated as "turning point," "change," or "transition," specifically referring to the political, economic, and social changes that occurred in Germany after the fall of the Berlin Wall and the reunification of East and West Germany in 1990. However, "Wende" also carries a cultural and historical significance that is difficult to convey with a single English term.

A | Appendix to Chapter 1

A.1. Contextual information

Inadequate methodologies

Researchers use various methods to identify the causal effect of deportations. One notable approach is the *difference-in-difference* (DiD) technique. This technique requires data on two groups, exposed and unexposed, before and after exposure. The DiD technique is based on a stable treatment unit that can be decomposed into three main components (Rubin 1980; Lechner 2011): (1) one treatment, which means that the treatment and control groups must be stable in a repeated cross-sectional design, ruling out differential treatment; (2) no spillovers, which means that the treatment of one unit should not affect the outcomes of other units; and (3) parallel trends, which means that outcomes in the exposed and unexposed groups must trend similarly, as if they had not been exposed.

However, this approach relies on several assumptions that may not hold for the case of Soviet deportations. For instance, the first assumption implies that every ethnic group was subjected to the same deportation technique, and deportations were the only political intervention. However, deportation techniques were professionalized over the waves, and different means of coercion were used on different ethnicities. Moreover, Soviet citizens were exposed to multiple and repeated episodes of violence between 1939 and 1953, which contradicts any implicit stability assumption.[1] The second assumption is also implausible given the financial and economic interconnectedness of the regions within a web of institutions and plans within the Soviet command system, let alone the global scale of World War II (Martin 2001).[2] Additionally, the third assumption can be rejected, as differences in pre-World War II trends between more advanced European Russia and backward Central Asia imply a non-monotonic growth relationship. Most importantly, the available data do not allow the reproduction of a meaningful control group since origin and host regions were treated alike. This complicates the identification of the causal effect of deportations and emphasizes the need for careful interpretation of the results.

The same criticisms can be leveled at pre-processing techniques like matching, which strive to balance the distribution of covariates in treated and control groups. Matching can create equal treatment probabilities, thereby reducing model reliance. However, my data cannot support the assumption that there is any inequality in the distribution that could be mitigated through matching. Even if it were possible to create a meaningful treatment and control group, successful matching would remove inappropriate observations from the sample. Consequently, matching methods that improve model robustness by downsampling are useful only for large datasets with thousands of observations. Because regional Soviet data consists of no more than 150 observations, further downsampling would contravene standard statistical assumptions. As a result, the effectiveness of matching methods that rely on a relatively small number of "convenient predictors," is rather poor (Sekhon 2008; Shadish et al. 2008).

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[1] This also relates to the Regression Discontinuity Design (RDD) as well, that uses the exogenous variation in the exposure to state-sponsored violence with the help of a "forcing" variable. It would not measure a specific policy intervention, the deportation, but also other war-related episodes.

[2] The presence of spatially clustered data is supported by the results of several statistical tests.

A.2. Figures

Figure A.2.1.: Union of the Socialist Soviet Republics

Source: Hirsch (2014), p. 303, map 7.1

Figure A.2.2.: Rehabilitation confirmation of Olga Vasilevna Klauser (b. 1918) issued in 1996

Source: Courtesy of the Kosior family archive in Berlin.

Figure A.2.3.: German Invasion of Russia: Operations August 26-December 5, 1941
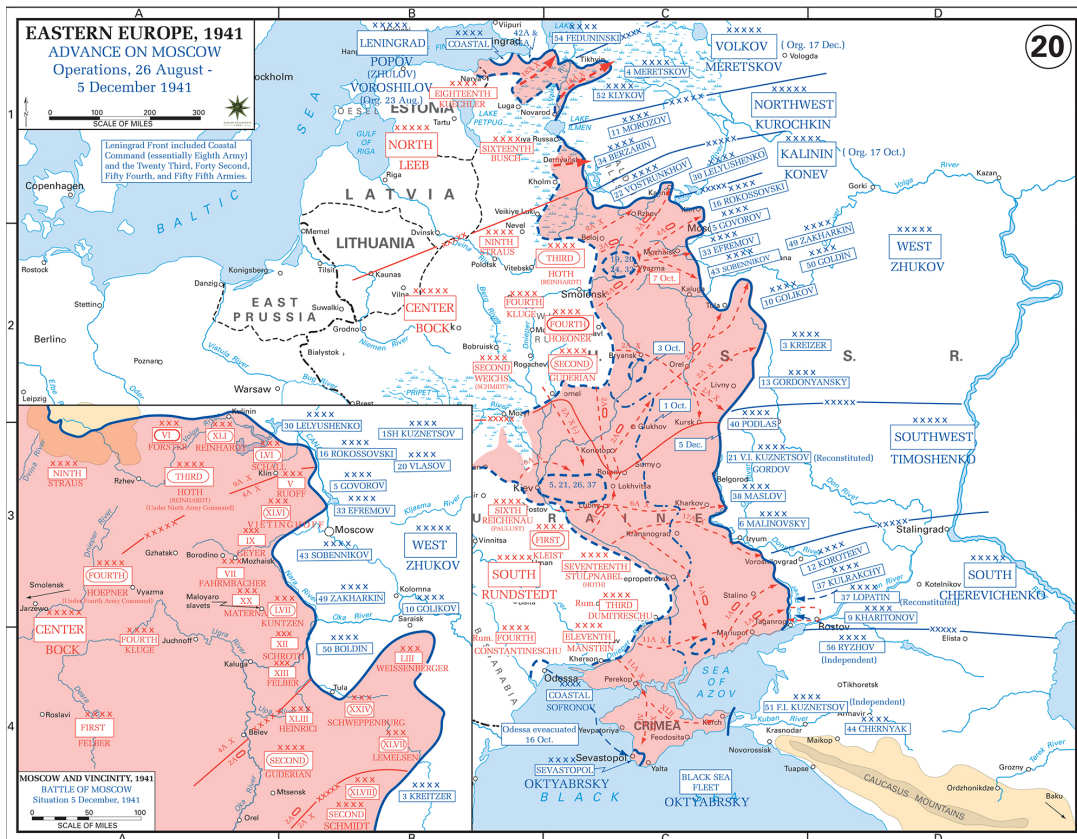
Source: Courtesy of the United States Military Academy Department of History,
obtained from the website of Emmerson Kent, Date of access: 05/08/2023

Figure A.2.4.: Occupation-skill gradient in the origin regions
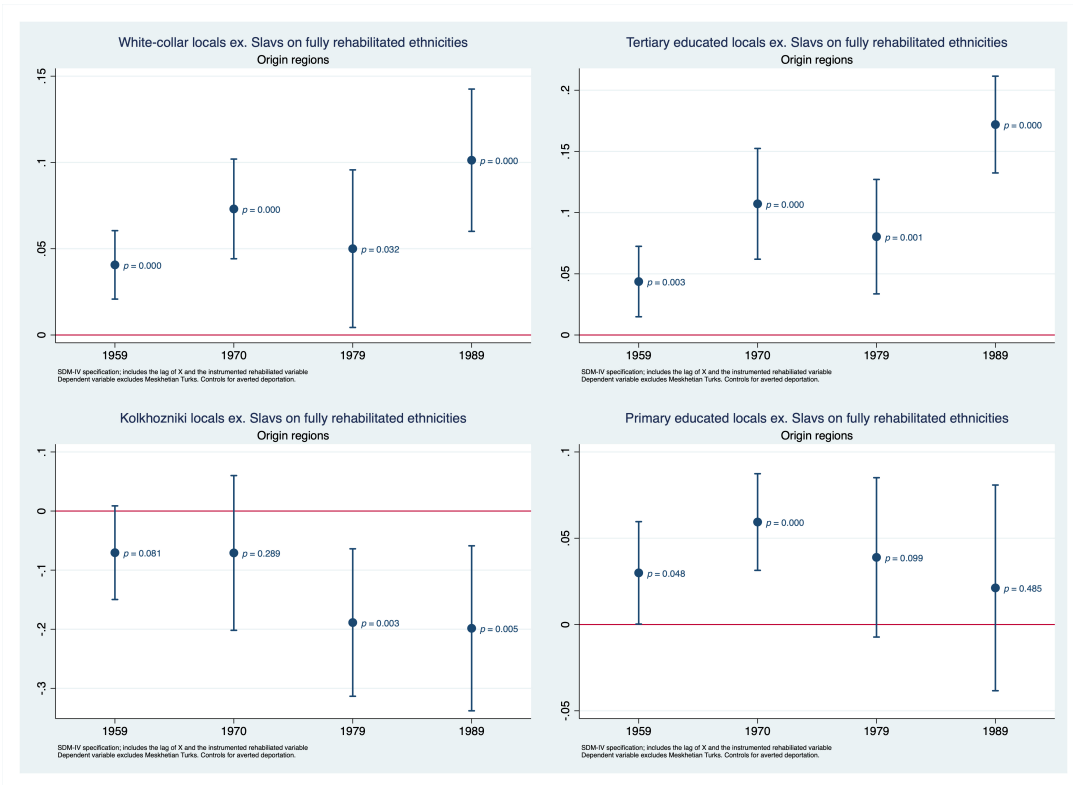
Figure A.2.5.: Occupation-skill gradient in the host regions
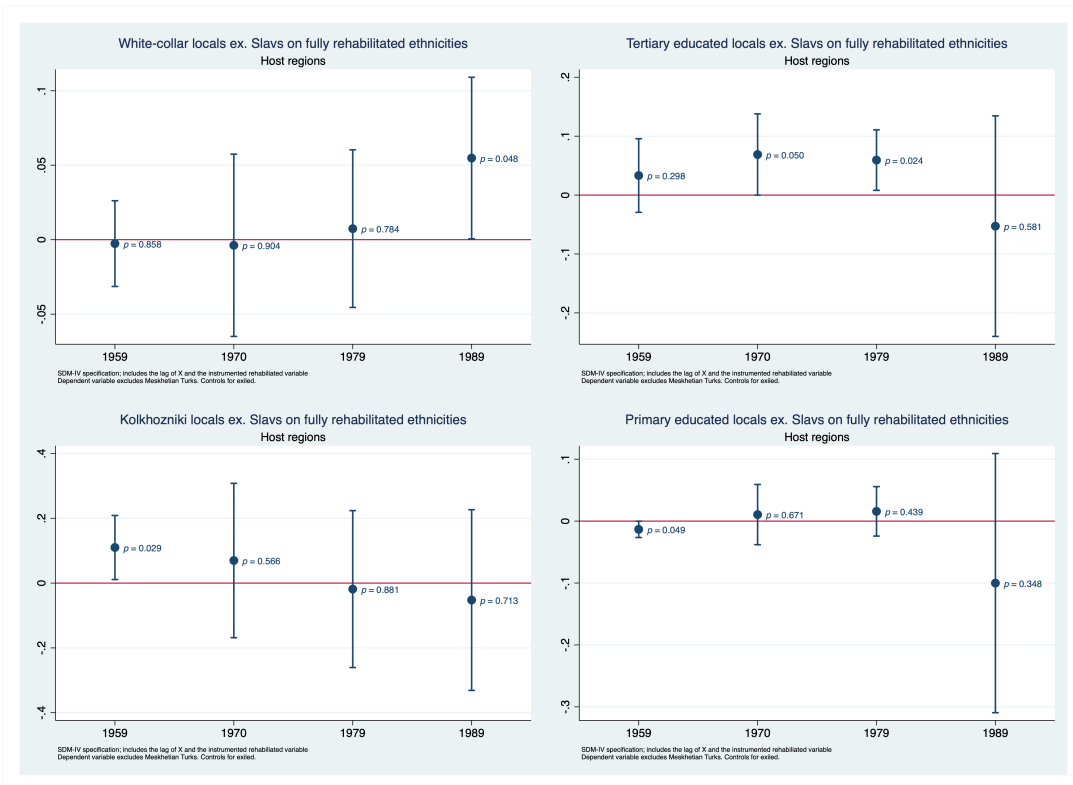
A.3. Tables

Table A.3.1.: Literacy rates in percent by nationality, 1926

Western nationalities				Eastern nationalities	
Latvians	78.1	**Tatars** ∗	33.6	**Ingush**	9.1
Estonians	72.4	Chuvash	32.2	**Azerbaijani** ∗∗	8.1
Jews	72.3	Mari	26.6	Ajars	7.8
Lithuanians	70.5	Udmurts	25.6	Kazakhs	7.1
Germans	61.2	Bashkirs	24.3	**Kabardians**	6.8
Poles	53.8	Buriats	23.2	**Balkars**	5.3
Russians	45.0	Mordvinians	22.9	Kirgiz	4.6
Ukrainians	41.3	Ossetians	21.2	Uzbeks	3.8
Georgians	39.5	Cherkess	16.9	**Chechens**	2.9
Belorussians	37.3	Abkhazy	11.3	Turkmen	2.3
Armenians	34.0	**Kalmyks**	10.9	Tajik	2.2
-	-	**Karachays**	9.2	Kara-Kalpaks	1.3

Source: Martin (2001), p. 127, table 13. ∗ Includes Volga and Crimean Tatars. ∗∗ Meskhetian Turks.

Table A.3.2.: Official list of "culturally backward" nationalities [extract], 1932∗

Rank	Nationality	Rank	Nationality	Rank	Nationality
8.	Balkars	30.	Koreans	74.	Azerbaijani∗∗
22.	Ingush	36.	Kabardians	75.	Tatars (outside ASSR)∗∗∗
24.	Kalmyks	37.	Karachays	84.	Chechens

∗ Based on the "Uniform Guideline for Assignment to Culturally Advanced and Backward Ethnic Groups" of 1932.

Source: Martin (2001), p. 167, table 21. ∗∗ Meskhetian Turks. ∗∗∗ Crimean Tatars.

Table A.3.3.: Repressive forced migrations in the USSR*

Year	M	D	Ethnicity	'1000	Origin region	Host region
1937	09-10	–	Koreans	172	Spassk, Posyet, Grodekovo, Birobidzhan, Vladivostok, Buryat–Mongol ASSR, Chita Obl.	Kazakh SSR (towns and settlements of the northern part), Uzbek SSR
1941	08	end	Germans	53	Crimean ASSR	Ordzhonikidze Kray and Rostov Obl.
	09	03-20	Germans	439	Volga German ASSR, Saratov and Stalingrad Obl.	Kazakh SSR, Krasnoyarsk Kray, Altay Kray, Novosibirsk and Omsk Obls.
			Germans (and Finns)	91	Leningrad Obl.	Krasnoyarsk Kray, the Novosibirsk and Omsk Obls., Kazakh SSR, Altay Kray
		15-20	Germans	36	Moscow, the Moscow and Rostov Obls.	Kazakh SSR
	09-10	25-10	Germans	ca. 138	Krasnodar Kray, Ordzhonikidze Kray, Tula Obl., Kabardian-Balkar ASSR and North-Ossetian ASSR (incl. Crimean residents that had been evacuated to Krasnodar Kray earlier)	Krasnoyarsk Kray, Irkutsk Obl., Kazakh SSR
	10	15-22	Germans	5	Voronezh Obl.	Novosibirsk, Omsk Obls.
		15-30	Germans	46	Georgian, Azerbaijani, and Armenian SSR	Kazakh SSR, Novosibirsk Obl.
		25-30	Germans	6	Daghestan and Chechen–Ingush ASSR	Kazakh SSR
		11	Germans	no data	Kalmyk ASSR	no data
1942	03	–	Germans	no data	Kharkov, Crimea, Dnepropetrovsk, Odessa, Kalinin Obls.	no data
	06	–	Germans, Romanians, Crimean Tatars, foreign nationals (Greeks)	no data	Krasnodar Kray	no data
1943	08	09	Karachays ("gang leaders" and "active bandits")	0.5	Karachai–Circassian AO	Beyond the Obl. boundaries
	11	02	Karachays	ca. 70	Karachai–Circassian AO	Kazakh SSR (the South-Kazakhstan and Dzhambul Obls.), Kyrgyz SSR
	12	28-31	Kalmyks	ca. 93	Kalmyk ASSR	Altay and Krasnoyarsk Kr., Novosibirsk, Omsk Obls.

Year	M	D	Ethnicity	'1000	Origin region	Host region
1944	02	23-29	Chechens (first trains)	393	Chechen-Ingush ASSR and Daghestan ASSR	Kazakh SSR, Kyrgyz SSR
		23-29	Ingushetians (first trains)	91	The Chechen-Ingush ASSR, Vladikavkaz	Kazakh SSR, Kyrgyz SSR
	03	08	Balkars (first trains)	38	Kabardian-Balkar ASSR	Kazakh SSR, Kyrgyz SSR
		25	Kalmyks	3	Rostov Obl.	Novosibirsk, Omsk Obl.
	05	05-10	Balkars	0.1	Klukhori district, Georgian USSR	Kazakh SSR, Kyrgyz SSR
		18	Crimean Tatars	182	The Crimean ASSR	The Uzbek SSR
	05-07		Kalmyks	26	Northern and eastern regions	European part of the RSFSR (Saratov,Voronezh Obls., Krasnodar Kray), Ukrainian SSR
	06	04	Kalmyks	1	Stalingrad Obl	Sverdlovsk Obl.
		20	Kabardians – family members of collaborators that left with Germans	2	Kabardian ASSR	Dzhambul and South-Kazakhstan Obl.
	11	15-18	Meskhetian Turks, Kurds and Khemshins	ca. 92	Georgian SSR	Uzbek, Kazakh and Kyrgyz SSR

* Data are rounded. Source: Polian (2004, p. 327)

Table A.3.4.: Correlates of main dependent variables with my settler variables

	Exiled '39	Rehabilitated '39	Exiled '59	Rehabilitated '59
White-collar employment:				
White-collar locals ex. Slavs '59	0.208**	−0.0762	0.0492	0.123
White-collar locals ex. Slavs '70	0.221**	−0.0651	0.0705	0.147
White-collar locals ex. Slavs '79	0.223**	−0.0684	0.0686	0.152
White-collar locals ex. Slavs '89	0.226**	−0.0754	0.0788	0.144
Collective farm employment:				
Kolkhozniki locals ex. Slavs '59	0.108	−0.0840	0.0985	−0.0133
Kolkhozniki locals ex. Slavs '70	0.157	−0.0402	0.0523	−0.0155
Kolkhozniki locals ex. Slavs '79	0.254**	−0.0447	0.0693	−0.0191
Kolkhozniki locals ex. Slavs '89	0.165	−0.0510	0.146	−0.0234
Tertiary education:				
Tertiary educated locals ex. Slavs '59	0.258**	−0.0613	0.0209	0.159
Tertiary educated locals ex. Slavs '70	0.270***	−0.0598	0.0112	0.170*
Tertiary educated locals ex. Slavs '79	0.255**	−0.0641	0.0266	0.166
Tertiary educated locals ex. Slavs '89	0.122	−0.0537	0.0746	0.0910
Primary education:				
Primary educated locals ex. Slavs '59	0.129	−0.0916	0.0410	0.0974
Primary educated locals ex. Slavs '70	0.172*	−0.0648	0.0777	0.105
Primary educated locals ex. Slavs '79	0.193*	−0.0423	0.109	0.113
Primary educated locals ex. Slavs '89	0.113	−0.0348	0.0729	0.0253
Social conflict:				
Not preserve '91	0.0181	−0.00308	−0.263***	0.0225
No. Protests '87-92	0.230**	0.0736	0.246**	0.113

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.3.5.: Descriptive statistics with non-imputed values

Variable	Mean	SD	Min	Max
	Panel A: Ethnic controls			
Exiled '39	13,036.16	44,414.9	0	291,206
Exiled '59	24,792.27	43,531.3	35	258,225
Rehabilitated '39	7,302.30	47,062.3	0	451,547
Rehabilitated '59	9,906.29	25,298.7	0	227,985
Jews '39	7,472.98	12,716.3	0	65,556
Jews '59	5,493.84	26,261.3	0	243,974
Polarization index '89	0.58	0.2	0	1
within-group IA '89, exiled	0.00	0.0	0	0
within-group IA '89, rehabilitated	0.01	0.1	0	1
between-group IA '89, rehabilitated	0.05	0.2	0	1
between-group IA '89, exiled	0.04	0.1	0	0
	Panel B: Violent and geographic controls			
Urban population '39	371,704.81	460,792.5	0	2,421,432
No. gulags '23-39	0.71	1.8	0	9
No. gulags '40-59	2.74	5.2	0	27
Defense inst. '39	44.22	75.0	0	575
Defense inst. '59	97.23	168.4	0	1,338
Nazi	0.21	0.4	0	1
Latitude	52.02	7.1	40	69
Longitude	65.31	32.3	29	178
	Panel C: Dependent variables: ex. Slavs			
Social conflict:				
Not preserve '91	0.22	0.2	0	1
No. Protests'87-92	35.95	92.4	0	655
White-collar employment:				
White-collar locals ex. Slavs '59	182,012.44	165,746.0	2,265	950,679
White-collar locals ex. Slavs '70	226,800.19	204,684.3	2,917	1,297,471
White-collar locals ex. Slavs '79	267,756.13	240,177.7	3,495	1,606,289
White-collar locals ex. Slavs '89	344,878.31	305,168.0	3,495	1,982,934
Collective farm employment:				
Kolkhozniki locals ex. Slavs '59	236,769.68	220,538.5	2,348	973,322
Kolkhozniki locals ex. Slavs '70	163,020.45	178,522.9	114	860,633
Kolkhozniki locals ex. Slavs '79	131,350.78	146,061.1	53	678,222
Kolkhozniki locals ex. Slavs '89	111,327.63	122,639.0	53	604,289
Tertiary education:				
Tertiary educated locals ex. Slavs '59	13,302.33	14,586.5	130	94,852
Tertiary educated locals ex. Slavs '70	29,514.58	32,202.8	266	227,424
Tertiary educated locals ex. Slavs '79	66,201.88	67,356.7	753	469,149
Tertiary educated locals ex. Slavs '89	108,118.69	144,093.7	753	1,167,242
Primary education:				
Primary educated locals ex. Slavs '59	216,438.23	201,498.1	1,838	1,006,618
Primary educated locals ex. Slavs '70	250,646.65	214,582.1	2,283	1,039,710
Primary educated locals ex. Slavs '79	227,871.19	186,017.9	2,317	898,869
Primary educated locals ex. Slavs '89	203,049.90	265,588.7	2,317	2,282,848

Table A.3.6.: Sample of origin regions

ID	Country	Unit	Status
1	GE	Adzharskaia ASSR	Autonomous republic
2	GE	Abkhazskaia ASSR	Autonomous republic
3	GE	Gruzinskaia SSR	Union republic
4	GE	Iugo-Osetinskaia avtonomnaia oblast'	Autonomous oblast
5	RU	Khabarovskii krai	Krai
6	RU	Severo-Osetinskaia ASSR	Autonomous republic
7	RU	Stavropol'skii krai	Krai
8	RU	Chukotskii avtonomnyi okrug	Autonomous okrug
9	RU	Mordovskaia ASSR	Autonomous republic
10	RU	Khanty-Mansiiskii avtonomnyi okrug	Autonomous okrug
11	RU	Iamalo-Nenetskii avtonomnyi okrug	Autonomous okrug
12	RU	Kurskaia oblast'	Oblast
13	RU	Krasnodarskii krai	Krai
14	RU	Tambovskaia oblast'	Oblast
15	RU	Voronezhskaia oblast'	Oblast
16	RU	Leningradskaia oblast'	Oblast
17	RU	Primorskii krai	Krai
18	RU	Dagestanskaia ASSR	Autonomous republic
19	RU	Rostovskaia oblast'	Oblast
20	RU	Evenkiiskii avtonomnyi okrug	Autonomous okrug
21	RU	Amurskaia oblast'	Oblast
22	RU	Kalininskaia oblast'	Oblast
23	RU	Murmanskaia oblast'	Oblast
24	RU	Karachaevo-Cherkesskaia avtonomnaia oblast'	Autonomous oblast
25	RU	Komi-Permiatskii avtonomnyi okrug	Autonomous okrug
26	RU	Nenetskii avtonomnyi okrug	Autonomous okrug
27	RU	Buriatskaia ASSR	Autonomous republic
28	RU	Saratovskaia oblast'	Oblast
29	RU	Tatarskaia ASSR	Autonomous republic
30	RU	Penzenskaia oblast'	Oblast
31	RU	Iaroslavskaia oblast'	Oblast
32	RU	Kalmytskaia ASSR	Autonomous republic
33	RU	Volgogradskaia oblast'	Oblast
34	RU	Orlovskaia oblast'	Oblast
35	RU	Smolenskaia oblast'	Oblast
36	RU	Checheno-Ingushskaia ASSR	Autonomous republic
37	RU	Adygeiskaia avtonomnaia oblast'	Autonomous oblast
38	RU	Ust'-Ordynskii Buriatskii avtonomnyi okrug	Autonomous okrug
39	RU	Kabardino-Balkarskaia ASSR	Autonomous republic
40	UK	Zaporozhskaia oblast'	Oblast
41	UK	Voroshilovgradskaia oblast'	Oblast
42	UK	Donetskaia oblast'	Oblast
43	UK	Krymskaia oblast'	Oblast

Table A.3.7.: Sample of host regions

ID	Country	Unit	Status
1	KZ	Aktiubinskaia oblast'	Oblast
2	KZ	Tselinogradskaia oblast'	Oblast
3	KZ	Severo-Kazakhstanskaia oblast'	Oblast
4	KZ	Semipalatinskaia oblast'	Oblast
5	KZ	Dzhambulskaia oblast'	Oblast
6	KZ	Ural'skaia oblast'	Oblast
7	KZ	Chimkentskaia oblast'	Oblast
8	KZ	Kustanaiskaia oblast'	Oblast
9	KZ	Alma-Atinskaia oblast'	Oblast
10	KZ	Kzyl-Ordinskaia oblast'	Oblast
11	KZ	Vostochno-Kazakhstanskaia oblast'	Oblast
12	KZ	Pavlodarskaia oblast'	Oblast
13	KZ	Karagandinskaia oblast'	Oblast
14	KZ	Gur'evskaia oblast'	Oblast
15	KG	Oshskaia oblast'	Oblast
16	RU	Altaiskii krai	Krai
17	RU	Riazanskaia oblast'	Oblast
18	RU	Udmurtskaia ASSR	Autonomous republic
19	RU	Chitinskaia oblast'	Oblast
20	RU	Tul'skaia oblast'	Oblast
21	RU	Gor'kovskaia oblast'	Oblast
22	RU	Iakutskaia ASSR	Autonomous republic
23	RU	Permskaia oblast'	Oblast
24	RU	Evreiskaia avtonomnaia oblast'	Autonomous oblast
25	RU	Aginskii Buriatskii avtonomnyi okrug	Autonomous okrug
26	RU	Novosibirskaia oblast'	Oblast
27	RU	Moskovskaia oblast'	Oblast
28	RU	Taimyrskii (Dolgano-Nenetskii) avtonomnyi okrug	Autonomous okrug
29	RU	Sverdlovskaia oblast'	Oblast
30	RU	Bashkirskaia ASSR	Autonomous republic
31	RU	Kirovskaia oblast'	Oblast
32	RU	Cheliabinskaia oblast'	Oblast
33	RU	Sakhalinskaia oblast'	Oblast
34	RU	Koriakskii avtonomnyi okrug	Autonomous okrug
35	RU	Vologodskaia oblast'	Oblast
36	RU	Chuvashskaia ASSR	Autonomous republic
37	RU	Khakasskaia avtonomnaia oblast'	Autonomous oblast
38	RU	Komi ASSR	Autonomous republic
39	RU	Mariiskaia ASSR	Autonomous republic
40	RU	Orenburgskaia oblast'	Oblast
41	RU	Kuibyshevskaia oblast'	Oblast
42	RU	Karel'skaia ASSR	Autonomous republic
43	RU	Omskaia oblast'	Oblast
44	RU	Ivanovskaia oblast'	Oblast
45	RU	Krasnoiarskii krai	Krai
46	RU	Gorno-Altaiskaia avtonomnaia oblast'	Autonomous oblast
47	RU	Arkhangel'skaia oblast'	Oblast

ID	Country	Unit	Status
48	RU	Kamchatskaia oblast'	Oblast
49	RU	Irkutskaia oblast'	Oblast
50	UZ	Tashkentskaia oblast'	Oblast
51	UZ	Samarkandskaia oblast'	Oblast
52	UZ	Khorezmskaia oblast'	Oblast
53	UZ	Karakalpakskaia ASSR	Autonomous republic
54	UZ	Bukharskaia oblast'	Oblast
55	UZ	Ferganskaia oblast'	Oblast

Table A.3.8.: Data Description and Sources

Variable	Description	Source
lnSlu39	This is the Log of the population classified as "white collar workers" (sluzhashie) in the 1939 census. The remaining categories are "workers" (rabochie) and a residual category including individuals working in the agricultural sector (kolkhozniki). As the census information in the physical census publication for 1939 are put in comparison to its 1959 values, I reconstruct the total number of white collar workers based on the reported number of laborers with completed higher education in urban and rural regions and the reported country-wide labor force, which represents those individuals with occupations or who are employed in subsidiary farming and take the logarithm.	Census volumes for the respective republics 1959, table 31 & 37
lnSlu59, lnSlu70, lnSlu79, lnSlu89	This is the Log of the population classified as "white collar workers" (sluzhashie) in the 1959 to 1989 census publications. The remaining categories are "workers" (rabochie) and a residual category including individuals working in the agricultural sector (kolkhozniki). It is constructed by taking the log of the total population employed in white collar positions.	Census 1959 for the respective republics, table 29; Census 1979, book 5, table 3; Census 1989, table 9:3
lnRab39	This is the Log of the population classified as "blue collar workers" (rabochie) in the 1939 census. The remaining categories are "white collar workers" (sluzhashie) and a residual category including individuals working in the agricultural sector (kolkhozniki). As the census information in the physical census publication for 1939 are put in comparison to its 1959 values, I reconstruct the total number of white collar workers based on the reported number of laborers with completed and incomplete secondary education in urban and rural regions and the reported country-wide labor force, which represents those individuals with occupations or who are employed in subsidiary farming and take the logarithm.	Census 1959 for the respective republics, table 31 & 37

Variable	Description	Source
lnRab59, lnRab70, lnRab79, lnRab89	This is the Log of the population classified as "blue collar workers" (rabochie) in the 1959 to 1989 census publications. The remaining categories are " white collar workers" (sluzhashie) and a residual category including individuals working in the agricultural sector (kolkhozniki). It is constructed by taking the log of the total population employed in blue collar positions.	Census volumes 1959 for the respective republics, table 29; Census 1970, vol. 5, table 3; Census 1979, vol. 7, tab 3; Census 1989, table 9:3
lnKolkh39	This is the Log of the population classified as "collective farmers" (kolkhozniki) in the 1939 census. The remaining categories are "white collar workers" (sluzhashie) and a residual category including individuals working blue collar professions (rabochie). As the census information in the physical census publication for 1939 are put in comparison to its 1959 values, I reconstruct the total number of collective farmers based on the reported number of individuals with completed and incompleted secondary education in urban and rural regions and the reported country-wide labor force, which represents those individuals with occupations or who are employed in subsidiary farming and take the logarithm.	Census 1959 for the respective republics, table 31 & 37
lnKolkh59, lnKolkh70, lnKolkh79, lnKolkh89	This is the Log of the population classified as "collective farmers" (kolkhozniki) in the 1959 to 1989 census publications. The remaining categories are " white collar workers" (sluzhashie) and individuals working in blue collar professions (rabochie). It is constructed by taking the log of the total population employed in blue collar positions.	Census volumes 1959 for the respective republics, table 29; Census 1970, vol. 5, table 3; Census 1979, vol. 7, tab 3; Census 1989, table 9:3
lnTer39	This is the log of the total population who acquired tertiary education in the regions that existed before December 31st, 1939 and which were consistently reported through 1989. It constructed by multiplying the share of tertiary educated citizens in urban and rural dwellings as tabulated in the census of 1959 with the overall population in the region an taking the logarithm.	Census 1959 for the respective republics, table 23
lnTer59, lnTer70, lnTer79, lnTer89	This is the log of the population, that has obtained tertiary education.It is constructed by taking the logarithm of total number citizens with completed higher (*vysshim*) and incomplete higher (*nezakonchennym vysshim*).	Census 1959 for the respective republics, table 22; Census 1970, vol. 3, table 2; Census 1979, vol. 3, table 4; Census 1989, table 6:2
lnSec39	This is the log of the total population who acquired secondary education in the regions that existed before December 31st, 1939 and which were consistently reported through 1989. It is constructed by multiplying the share of secondary educated citizens in urban and rural dwellings as tabulated in the census of 1959 with the overall population in the region an taking the logarithm.	Census 1959 for the respective republics, table 23

Variable	Description	Source
lnSec59, lnSec70, lnSec79, lnSec89	This is the log of the population, that has obtained secondary education. It is constructed by taking the logarithm of the citizens with special secondary (*srednim spetsial'nym*), general secondary (*srednim obshchim*) and incomplete secondary (*nepolnym srednim*).	Census 1959 for the respective republics, table 22; Census 1970, vol. 3, table 2; Census 1979, vol. 3, table 4; Census 1989, table 6:2
lnPrim39	This is the log of the total population who acquired primary education in the regions that existed before December 31st, 1939 and which were consistently reported through 1989. It is constructed by calculating the regional share of primary educated individuals over all educated individuals as per the 1959 census and multiplying it with the number of individuals living in rural regions and taking the logarithm.	Census 1959 for the respective republics, table 23, www.demoscope.ru
lnPrim59, lnPrim70, lnPrim79, lnPrim89	This is the log of the population, that has obtained primary education. It is constructed by taking the logarithm of total number citizens with primary education (*nachal'nym*).	Census 1959 for the respective republics, table 22; Census 1970, vol. 3, table 2; Census 1979, vol. 3, table 4; Census 1989, table 6:2
npres	Percentage of voters who voted 'no' to the question "Do you consider it necessary to preserve the USSR as a renewed federation of equal sovereign republics, in which human rights and the freedoms of all nationalities will be fully guaranteed?" in the 1991 USSR referendum. It is constructed as $1 - votes$ in favor of the preservation.	https://www.electoralgeography.com; www.gorby.ru
lnProts	Total number of protests and riots between 1987 and 1992 taken from Beissinger (2002).	xSub cross national data on subnational violence
MeskhTurks39, CrimeanTat39, Germans39, Kabardians39, Balkars39, Kalmyks39, Chechens39, Koreans39, Ingush39	This is the pre-war population of the ethnicities that are to be deported. MeskhTurks39 includes not only Meskhetian Turks, but also Kurds, Turks and Kemshului Turks. CrimeanTat39 are in Soviet Ukraine and Soviet Russia the "татары крымское" (Crimean Tatars) and in Georgia, Uzbekistan, Kazakhstan and Kyrgyzstan as "татары" (Tatars).	Polian (2004, supplement # 1) Lorimer (1946), http://www.demoscope.ru
MeskhTurks53, CrimeanTat53, Germans53, Kabardians53, Balkars53, Kalmyks53, Chechens53, Koreans53, Ingush53	This is the postwar population of the ethnicities that were to be deported. MeskhTurks53 includes not only Meskhetian Turks, but also Kurds, Turks and Kemshului Turks. CrimeanTat53 are in Soviet Ukraine and Soviet Russia the "татары крымское" (Crimean Tatars) and in Georgia, Uzbekistan, Kazakhstan and Kyrgyzstan as "татары" (Tatars). Zero or missing values are replaced by their 1959 values	Zemskov (2005) Lorimer (1946), http://www.demoscope.ru

Variable	Description	Source
`MeshTurks59[-89]`, `CrimeanTat59[-89]`, `Germans59[-89]`, `Kabardians59[-89]`, `Balkars59[-89]`, `Kalmyks59[-89]`, `Chechens59[-89]`, `Koreans59[-89]`, `Ingush59[-89]`	This is the postwar population of the ethnicities that are to be deported. `MeshTurks59[-89]` includes not only Meskhetian Turks, but also Kurds, Turks and Kemshului Turks. `CrimeanTat59[-89]` are in Soviet Ukraine and Soviet Russia the "татары крымское" (Crimean Tatars) and in Georgia, Uzbekistan, Kazakhstan and Kyrgyzstan as "татары" (Tatars).	Zemskov (2005) Lorimer (1946), Urban and rural population of the USSR republics (except RSFSR) by sex and nationality *[Городское и сельское население областей республик СССР (кроме РСФСР) по полу и национальности]* from `http://www.demoscope.ru`
`Jews39[-89]`, `JewsGorsk39[-89]`, `JewsCrim39[-89]`, `JewsAsia39[-89]`, `Jews39[-89]`	This is the pre- and postwar Jewish population as recorded in the all-union census and Altshuler (1993). It it is a composite indicator collecting the number of Jews from European Russia, from the Caucasus, Central Asian republics and from Crimea.	Urban and rural population of the USSR republics (except RSFSR) by sex and nationality *[Городское и сельское население областей республик СССР (кроме РСФСР) по полу и национальности]* from `http://www.demoscope.ru`
`dpSet3959`	Is the change in the percentage of rehabilitated and permanently exiled "special settlers" between 1939 and 1959. It is calculated based on the total number of Chechen, Ingush, Kalmyks, Balkars, Kabardians, Meskhetian Turks (Azeri), Germans, Crimean Tatars, Koreans at the moment of their departure in the origin region i, that I reconstructed from supplement #1 in Polian (2004) and cross-referenced it with Lorimer (1946) and the 1939 All-Union census in order to obtain the total stock of settler in 1939. As the Korean population was already deported in 1937, I reconstructed its share based on the total number of Koreans as per the 1926 All-Union census, who resided in regions that belonged to the Soviet Union in 1939. The total number of citizens that will be later permanently and temporarily exiled is then divided over the total population in 1939 in region i. The post-deportation share is calculated from the total number of rehabilitated and non-rehabilitated settler in their host regions as per January 1st, 1953 over the total population in region i as per the All-Union Census. It is constructed as $\Delta\text{Set}_{i,39\rightarrow53} = \left(\frac{\text{Set}_{i,39}}{\text{Pop}_{i,39}} - \frac{\text{Set}_{i,53}}{\text{Pop}_{i,59}} \right) * 100\%$.	Zemskov (2005), Lorimer (1946), `www.demoscope.ru`; Census 1959 for the respective republics

Variable	Description	Source
dpURSet3959	It is the change in the share of permanently exiled ethnicities between 1939 and 1959. It is constructed similar to the general settler variable but applied only to the four ethnicities that have not been restored in their administrative and political rights. It thus the overall change in the share of Germans, Crimean Tatars, Koreans and Meskhetian Turks. It is constructed as $\Delta E_{i,39\to53} = \left(\frac{E_{i,39}}{\mathrm{Pop}_{i,39}} - \frac{E_{i,53}}{\mathrm{Pop}_{i,59}} \right) * 100\%$.	Zemskov (2005), Lorimer (1946), `http://www.demoscope.ru/weekly/pril.php`; Census 1959 for the respective republics
dpRSet3959	It is the change in the share of rehabilitated settler between 1939 and 1959. It is constructed similar to the general settler variable but applied only to the four ethnicities that have not been restored in their administrative and political rights. It thus the overall change in the share of Chechens, Ingush, Kalmyks, Kabardians, Balkars. It is constructed as $\Delta R_{i,39\to53} = \left(\frac{R_{i,39}}{\mathrm{Pop}_{i,39}} - \frac{R_{i,53}}{\mathrm{Pop}_{i,59}} \right) * 100\%$.	Zemskov (2005), Polian (2004, supplement # 1) Lorimer (1946), `http://www.demoscope.ru`; Census 1959 for the respective republics
dpJews3959	This is the change in the share of the Jewish population as a percentage of total region population in 1939 versus its 1959 values. It is constructed as $\Delta\mathrm{Jews}_{i,39\to59} = \left(\frac{\mathrm{Jews}_{i,39}}{\mathrm{Pop}_{i,39}} - \frac{\mathrm{Jews}_{i,59}}{\mathrm{Pop}_{i,59}} \right) * 100\%$	`http://www.demoscope.ru`, Altshuler (1993)
Nazi	An oblast' is classified as occupied if at least one city in the region has been occupied by the German Wehrmacht for at least six months. A city has been occupied if it is listed in Dudarenko et al. (1985). Cities that were only partially occupied according to this source are classified as occupied.	Dudarenko et al. (1985), `https://www.soldat.ru/spravka/freedom/1-ssr-1.html`
Gulag	The growth of labor camps within the Gulag system operating between 1917 to 1939 (pre-treatment) and 1940 to 1959 (post-treatment) in region i. This variable matches all installations listed in Smirnov (1998) to the names of regions in the respective Soviet republics that existed before December 31st, 1939 and which are consistently reported through 1989. It is constructed $g\mathrm{Gulag}_{i,39\to59} = \frac{\mathrm{Gulag}_{i,59} - \mathrm{Gulag}_{i,39}}{\mathrm{Gulag}_{i,39}}$.	Smirnov (1998)

Variable	Description	Source
gdefInd	The growth of defense facilities, research, and design establishments operating in a given region between 1917 to 1939 (pre-treatment) and 1940 to 1959 (post-treatment). The growth variable is constructed by matching all 32,995 listed in Dexter and Rodionov (2020) database (version 21) to the names of the 1939 regions. I used the count of the number of operating establishments from 1917 to 1939 and 1940 to 1960 in each oblast'. This number excludes all facilities that were reported to have relocated from one location to another in 1941 to 1942 during the advancement of the German Wehrmacht. They have been identified by matching name, address and leadership personnel. The variable Growth Defense Industry is defined as $g\mathrm{Def}_{i,39\to59} = \frac{\mathrm{Def}_{i,59}-\mathrm{Def}_{i,39}}{\mathrm{Def}_{i,39}}$, where I set $g\mathrm{Def}_{i,39\to59} = 0$ if $\mathrm{Def}_{i,59} = \mathrm{Def}_{i,39} = 0$ and $\mathrm{Def}_{i,t}$ is the count of facilities in oblast' i.	Dexter and Rodionov (2020), version 21
lnPopT39, lnPopT59, lnPopT70, lnPopT79, lnPopT89	This is the log of the total population in 1939, 1959, 1970, 1979 and 1989. I adjust for changes in the administrative boundaries by accounting for neighborhood relations in 1939 for regions that existed before December 31st, 1939 and are continuously tracked through 1989.	www.demoscope.ru; Census 1959 for the respective republics, table 4; Census 1970, vol. 1, table 2; Census 1979, vol. 7, tab 3; Census 1989, table 1:3
lnPopU39	Log of the population dwelling in urban areas as per the 1939 All-union Census.	www.demoscope.ru
lnPopR39	Log of the population dwelling in rural areas as per the 1939 All-union Census.	www.demoscope.ru
dlogpop3959	This is the log of the total loss in population in region i between 1939 and 1959. It is constructed by deducting the total population in region i in 1959 from its total population in 1959 and taking the logarithm.	www.demoscope.ru; Census 1959 for the respective republics, table 4
dlogpop3959	This is the log of the total loss in population in region i between 1939 and 1959. It is constructed by deducting the total population in region i in 1959 from its total population in 1959 and taking the logarithm.	www.demoscope.ru; Census 1959 for the respective republics, table 4
sh_Slu_settlers, sh_Kolkh_settlers, sh_Prim_settlers, sh_Ter_settlers	This is the share of permanently exiled ethnicities; i.e. Meskhetian Turks, ethnic Germans, Crimean Tatars and Koreans, in white-collar and kolkhoz employment respectively primary and tertiary education. It is constructed using the 1989 numbers of employed ethnicities, split by the respective level of education. The latter is condensed into a three-tier structure, where the highest educational level, that is complete and incomplete tertiary education, corresponds to white-collar employment and so forth. Numbers smaller 0.25 and larger than 1 are dropped and subsequently replaced by their mean.	Census 1989 (GESIS archiv), table V9T2, V6T2A, V7T61_76, V7T93108

Variable	Description	Source
sh_Slu_rehab, sh_Kolkh_rehab, sh_Prim_rehab, sh_Ter_rehab	This is the share of rehabilitated ethnicities; i.e. Balkars, Kabardians, Ingush, Chechens, Kalmyks, Karachays, in white-collar and kolkhoz employment respectively primary and tertiary education. It is constructed using the 1989 numbers of employed ethnicities, split by the respective level of education. The latter is condensed into a three-tier structure, where the highest educational level, that is complete and incomplete tertiary education, corresponds to white-collar employment and so forth. Numbers smaller 0.25 and larger than 1 are dropped and subsequently replaced by their mean.	Census 1989 (GESIS archiv), table V9T2, V6T2A, V7T61_76, V7T9310
sh_Slu_Slavs, sh_Kolkh_Slavs, sh_Prim_Slavs, sh_Ter_Slavs	This is the share of the Slavic population; i.e. ethnic Russians, Belorussians and Ukrainians, in white-collar and kolkhoz employment respectively primary and tertiary education. It is constructed using the 1989 numbers of employed ethnicities, split by the respective level of education. The latter is condensed into a three-tier structure, where the highest educational level, that is complete and incomplete tertiary education, corresponds to white-collar employment and so forth.	Census 1989 (GESIS archiv), table V9T2, V6T2A, V7T61_76, V7T931
lnSlu_localexSlav59[-89], lnKolkh_localexSlav59[-89], lnPrim_localexSlav59[-89], lnTer_localexSlav59[-89]	This is the log-transformed total local population in white-collar and collective farm employment respectively primary and tertiary education. The local white-collar and collective farm employment respectively primary and tertiary education is constructed by subtracting (1-sh_Slu_Slavs −sh_Slu_settlers), (1-sh_Ter_Slavs −sh_Ter_settlers) respectively, (1-sh_Kolkh_Slavs −sh_Kolkh_settlers) and (1-sh_Prim_Slavs −sh_Prim_settlers). Each resulting local share is then multiplied by the overall totals and subsequently logarithmically transformed. Outliers are accounted for by Winsorizing the log-transformed data, which means that values smaller or larger three times its standard deviation, are replaced precisely this cut-off value.	Census 1989 (GESIS archiv), table V9T2, V6T2A, V7T61_76, V7T931, see above for Censuses 1959-89
outgroupUR89	It is the proportion of expected between-group ties (outgroup_i) of permanently exiled on the basis of the probability of interaction with other ethnicities in region j: $\text{neighbor}_{i-i,j} = \frac{2[n_i * (n_{-i})]}{\text{totint}_j}$, where n_i is the number of people in permanent exile, that is the number of Meskhetian Turks, Crimean Tatars, ethnic Germans and Koreans. Consequently, n_{-i} is the number of all other people residing in the respective region, not deported at all or rehabilitated. The between-group interaction is calculated based on the total number of interactions (totint_j) in a region j, that is calculated as follows: $\text{totint}_j = \frac{N_j}{(N_j-1)}$, where N_j is the total population in the region j.	http://www.demoscope.ru

continued ...

Variable	Description	Source
POL89	The ethnic polarization of the region calculated according Montalvo and Reynal-Querol (2005) as POL89 $= 1 - (\sum_{i=1}^{k}(\frac{0.5-p_i}{0.5})^2) * p_i$. It involves a weighted sum of population shares, where the weights capture the squared deviation of each group from the maximum polarization share $1/2$ as a proportion of $1/2$.	http://www.demoscope.ru

Table A.3.9.: Moran's I for the host regions

Weights matrix: R
Type: Distance-based (binary)
Distance band: $0.0 < d \leq 1900.0$
Row-standardized: Yes

Variable	Stat	Mean	Std. Dev.	z-Score	p-value
Employment:					
White-collar workers '59	0.032	−0.019	0.027	1.837	0.066
White-collar workers '70	0.024	−0.019	0.027	1.613	0.107
White-collar workers '79	0.016	−0.019	0.026	1.337	0.181
White-collar workers '89	0.009	−0.019	0.026	1.034	0.301
Collective farm workers '59	0.079	−0.019	0.028	3.458	0.001
Collective farm workers '70	0.073	−0.019	0.027	3.369	0.001
Collective farm workers '79	0.087	−0.019	0.028	3.825	0.000
Collective farm workers '89	0.097	−0.019	0.028	4.067	0.000
Education:					
Tertiary educated '59	0.019	−0.019	0.025	1.498	0.134
Tertiary educated '70	0.019	−0.019	0.024	1.577	0.115
Tertiary educated '79	0.012	−0.019	0.024	1.246	0.213
Tertiary educated '89	0.004	−0.019	0.024	0.922	0.357
Primary educated '59	0.049	−0.019	0.028	2.390	0.017
Primary educated '70	0.046	−0.019	0.028	2.293	0.022
Primary educated '79	0.055	−0.019	0.028	2.596	0.009
Primary educated '89	0.047	−0.019	0.028	2.290	0.022
Social conflict:					
Not preserve '91	0.043	−0.019	0.026	2.395	0.017
No. Protests'87-92	−0.022	−0.019	0.013	−0.276	0.783
Violence controls:					
Nazi	0.055	−0.019	0.027	2.724	0.006
No. gulags '40-59	−0.000	−0.019	0.027	0.661	0.509
No. gulags '23-39	0.035	−0.019	0.027	1.976	0.048
Defense inst. '39	0.035	−0.019	0.023	2.358	0.018
Defense inst. '59	0.020	−0.019	0.023	1.693	0.090
Latitude	0.165	−0.019	0.029	6.380	0.000
Longitude	0.715	−0.019	0.028	25.796	0.000
No. Jews '39	−0.018	−0.019	0.006	0.082	0.934
No. Jews '59	0.062	−0.019	0.024	3.301	0.001
Targeted ethnicities:					
Exiled '39	−0.005	−0.019	0.021	0.655	0.512
Rehabilitated '39	−0.030	−0.019	0.026	−0.432	0.666
Exiled '59	0.082	−0.019	0.027	3.726	0.000
Rehabilitated '59	−0.012	−0.019	0.026	0.248	0.804

Weights matrix: S
Type: Distance-based (binary)
Distance band: $0.0 < d \leq 1900.0$
Row-standardized: Yes

Variable	Stat	Mean	Std. Dev.	z-Score	p-value
Employment:					
White-collar workers '59	0.032	−0.019	0.027	1.837	0.066
White-collar workers '70	0.024	−0.019	0.027	1.613	0.107
White-collar workers '79	0.016	−0.019	0.026	1.337	0.181
White-collar workers '89	0.009	−0.019	0.026	1.034	0.301
Collective farm workers '59	0.079	−0.019	0.028	3.458	0.001
Collective farm workers '70	0.073	−0.019	0.027	3.369	0.001
Collective farm workers '79	0.087	−0.019	0.028	3.825	0.000
Collective farm workers '89	0.097	−0.019	0.028	4.067	0.000
Education:					
Tertiary educated '59	0.019	−0.019	0.025	1.498	0.134
Tertiary educated '70	0.019	−0.019	0.024	1.577	0.115
Tertiary educated '79	0.012	−0.019	0.024	1.246	0.213
Tertiary educated '89	0.004	−0.019	0.024	0.922	0.357
Primary educated '59	0.049	−0.019	0.028	2.390	0.017
Primary educated '70	0.046	−0.019	0.028	2.293	0.022
Primary educated '79	0.055	−0.019	0.028	2.596	0.009
Primary educated '89	0.047	−0.019	0.028	2.290	0.022
Social conflict:					
Not preserve '91	0.043	−0.019	0.026	2.395	0.017
No. Protests'87-92	−0.022	−0.019	0.013	−0.276	0.783
Violence controls:					
Nazi	0.055	−0.019	0.027	2.724	0.006
No. gulags '40-59	−0.000	−0.019	0.027	0.661	0.509
No. gulags '23-39	0.035	−0.019	0.027	1.976	0.048
Defense inst. '39	0.035	−0.019	0.023	2.358	0.018
Defense inst. '59	0.020	−0.019	0.023	1.693	0.090
Latitude	0.165	−0.019	0.029	6.380	0.000
Longitude	0.715	−0.019	0.028	25.796	0.000
No. Jews '39	−0.018	−0.019	0.006	0.082	0.934
No. Jews '59	0.062	−0.019	0.024	3.301	0.001
Targeted ethnicities:					
Exiled '39	−0.005	−0.019	0.021	0.655	0.512
Rehabilitated '39	−0.030	−0.019	0.026	−0.432	0.666
Exiled '59	0.082	−0.019	0.027	3.726	0.000
Rehabilitated '59	−0.012	−0.019	0.026	0.248	0.804

Table A.3.11.: LM-test results for spatial terms in the host regions

(a) Highest occupation-skill level

<u>Diagnostic tests for spatial dependence in OLS regression</u>

Fitted model
_____

lnSlu89 = dpSet3959 + Nazi + dpJews3959 + lnSlu39 +
          lnPopU39 + lnPopT89 + Gulag + Lat + Long +
          gdefInd + dlogpop3959
_____

Weights matrix
_____

Name: R
Type: Distance-based (binary)
Distance band: 0.0 < d <= 1900.0
Row-standardized: Yes

Diagnostics
_____

Test	Statistic	df	p-value
Spatial error:			
Moran´s I	-9.298	1	2.000
Lagrange multiplier	18.977	1	0.000
Robust Lagrange multiplier	420.914	1	0.000
Spatial lag:			
Lagrange multiplier	7080.091	1	0.000
Robust Lagrange multiplier	7482.027	1	0.000

<u>Diagnostic tests for spatial dependence in OLS regression</u>

Fitted model
_____

lnTer89 = dpSet3959 + Nazi + dpJews3959 + lnTer39 +
          lnPopU39 + lnPopT89 + Gulag + Lat + Long +
          gdefInd + dlogpop3959
_____

Weights matrix
_____

Name: R
Type: Distance-based (binary)
Distance band: 0.0 < d <= 1900.0
Row-standardized: Yes

Diagnostics
_____

Test	Statistic	df	p-value
Spatial error:			
Moran´s I	-2.808	1	1.995
Lagrange multiplier	3.639	1	0.056
Robust Lagrange multiplier	1842.532	1	0.000
Spatial lag:			
Lagrange multiplier	2.0e+04	1	0.000
Robust Lagrange multiplier	2.1e+04	1	0.000

(b) Lowest occupation-skill level

<u>Diagnostic tests for spatial dependence in OLS regression</u>

Fitted model
_____

lnKolkh89 = dpSet3959 + Nazi + dpJews3959 + lnKolkh39 +
          lnPopU39 + lnPopT89 + Gulag + Lat + Long +
          gdefInd + dlogpop3959
_____

Weights matrix
_____

Name: R
Type: Distance-based (binary)
Distance band: 0.0 < d <= 1900.0
Row-standardized: Yes

Diagnostics
_____

Test	Statistic	df	p-value
Spatial error:			
Moran´s I	5.466	1	0.000
Lagrange multiplier	1.494	1	0.222
Robust Lagrange multiplier	3580.811	1	0.000
Spatial lag:			
Lagrange multiplier	5949.407	1	0.000
Robust Lagrange multiplier	9528.723	1	0.000

<u>Diagnostic tests for spatial dependence in OLS regression</u>

Fitted model
_____

lnPrim89 = dpSet3959 + Nazi + dpJews3959 + lnPrim39 +
          lnPopU39 + lnPopT89 + Gulag + Lat + Long +
          gdefInd + dlogpop3959
_____

Weights matrix
_____

Name: R
Type: Distance-based (binary)
Distance band: 0.0 < d <= 1900.0
Row-standardized: Yes

Diagnostics
_____

Test	Statistic	df	p-value
Spatial error:			
Moran´s I	-25.856	1	2.000
Lagrange multiplier	108.070	1	0.000
Robust Lagrange multiplier	579.291	1	0.000
Spatial lag:			
Lagrange multiplier	5264.748	1	0.000
Robust Lagrange multiplier	5735.969	1	0.000

(c) Social conflict

<u>Diagnostic tests for spatial dependence in OLS regression</u>

Fitted model
_____

lnotpres = dpSet3959 + Nazi + dpJews3959 + lnSlu39 +
          lnTer39 + lnPopU39 + lnPopT89 + Gulag + Lat
          + Long + gdefInd + dlogpop3959
_____

Weights matrix
_____

Name: R
Type: Distance-based (binary)
Distance band: 0.0 < d <= 1900.0
Row-standardized: Yes

Diagnostics
_____

Test	Statistic	df	p-value
Spatial error:			
Moran´s I	13.359	1	0.000
Lagrange multiplier	17.673	1	0.000
Robust Lagrange multiplier	852.111	1	0.000
Spatial lag:			
Lagrange multiplier	224.121	1	0.000
Robust Lagrange multiplier	1058.559	1	0.000

<u>Diagnostic tests for spatial dependence in OLS regression</u>

Fitted model
_____

lnProts = dpSet3959 + Nazi + dpJews3959 + lnSlu39 +
          lnTer39 + lnPopU39 + lnPopT89 + Gulag + Lat +
          Long + gdefInd + dlogpop3959
_____

Weights matrix
_____

Name: R
Type: Distance-based (binary)
Distance band: 0.0 < d <= 1900.0
Row-standardized: Yes

Diagnostics
_____

Test	Statistic	df	p-value
Spatial error:			
Moran´s I	-9.241	1	2.000
Lagrange multiplier	18.914	1	0.000
Robust Lagrange multiplier	5.567	1	0.018
Spatial lag:			
Lagrange multiplier	51.207	1	0.000
Robust Lagrange multiplier	37.860	1	0.000

Table A.3.12.: LM-test results for spatial terms in the origin regions

(a) Highest occupation-skill level

```
Diagnostic tests for spatial dependence in OLS regression

Fitted model
─────────────────────────────────────────────────
lnSlu89 = dpSet3959 + Nazi + dpJews3959 + lnSlu39 +
          lnPopU39 + lnPopT89 + Gulag + Lat + Long +
          gdefInd + dlogpop3959
─────────────────────────────────────────────────

Weights matrix
─────────────────────────────────────────────────
Name: S
Type: Distance-based (binary)
Distance band: 0.0 < d <= 1900.0
Row-standardized: Yes

Diagnostics
─────────────────────────────────────────────────
Test                     | Statistic   df   p-value
─────────────────────────────────────────────────
Spatial error:           |
  Moran´s I              |   2.837      1    0.005
  Lagrange multiplier        0.245      1    0.621
  Robust Lagrange multiplier 0.197      1    0.657

Spatial lag:
  Lagrange multiplier        0.310      1    0.577
  Robust Lagrange multiplier 0.262      1    0.609
```

```
Diagnostic tests for spatial dependence in OLS regression

Fitted model
─────────────────────────────────────────────────
lnTer89 = dpSet3959 + Nazi + dpJews3959 + lnTer39 +
          lnPopU39 + lnPopT89 + Gulag + Lat + Long +
          gdefInd + dlogpop3959
─────────────────────────────────────────────────

Weights matrix
─────────────────────────────────────────────────
Name: S
Type: Distance-based (binary)
Distance band: 0.0 < d <= 1900.0
Row-standardized: Yes

Diagnostics
─────────────────────────────────────────────────
Test                     | Statistic   df   p-value
─────────────────────────────────────────────────
Spatial error:           |
  Moran´s I              |  -8.967      1    2.000
  Lagrange multiplier       27.844      1    0.000
  Robust Lagrange multiplier 146.222    1    0.000

Spatial lag:
  Lagrange multiplier     3365.692      1    0.000
  Robust Lagrange multiplier 3484.070   1    0.000
```

(b) Lowest occupation-skill level

```
Diagnostic tests for spatial dependence in OLS regression

Fitted model
─────────────────────────────────────────────────
lnKolkh89 = dpSet3959 + Nazi + dpJews3959 + lnKolkh39 +
            lnPopU39 + lnPopT89 + Gulag + Lat + Long +
            gdefInd + dlogpop3959
─────────────────────────────────────────────────

Weights matrix
─────────────────────────────────────────────────
Name: S
Type: Distance-based (binary)
Distance band: 0.0 < d <= 1900.0
Row-standardized: Yes

Diagnostics
─────────────────────────────────────────────────
Test                     | Statistic   df   p-value
─────────────────────────────────────────────────
Spatial error:           |
  Moran´s I              |  -1.502      1    1.867
  Lagrange multiplier        2.741      1    0.098
  Robust Lagrange multiplier 0.928      1    0.335

Spatial lag:
  Lagrange multiplier       52.120      1    0.000
  Robust Lagrange multiplier 50.307     1    0.000
```

```
Diagnostic tests for spatial dependence in OLS regression

Fitted model
─────────────────────────────────────────────────
lnPrim89 = dpSet3959 + Nazi + dpJews3959 + lnPrim39 +
           lnPopU39 + lnPopT89 + Gulag + Lat + Long +
           gdefInd + dlogpop3959
─────────────────────────────────────────────────

Weights matrix
─────────────────────────────────────────────────
Name: S
Type: Distance-based (binary)
Distance band: 0.0 < d <= 1900.0
Row-standardized: Yes

Diagnostics
─────────────────────────────────────────────────
Test                     | Statistic   df   p-value
─────────────────────────────────────────────────
Spatial error:           |
  Moran´s I              |   9.620      1    0.000
  Lagrange multiplier       14.571      1    0.000
  Robust Lagrange multiplier 405.621    1    0.000

Spatial lag:
  Lagrange multiplier     1.2e+04       1    0.000
  Robust Lagrange multiplier 1.3e+04    1    0.000
```

(c) Social conflict

```
Diagnostic tests for spatial dependence in OLS regression

Fitted model
─────────────────────────────────────────────────
lnotpres = dpSet3959 + Nazi + dpJews3959 + lnSlu39 +
           lnTer39 + lnPopU39 + lnPopT89 + Gulag + Lat
           + Long + gdefInd + dlogpop3959
─────────────────────────────────────────────────

Weights matrix
─────────────────────────────────────────────────
Name: S
Type: Distance-based (binary)
Distance band: 0.0 < d <= 1900.0
Row-standardized: Yes

Diagnostics
─────────────────────────────────────────────────
Test                     | Statistic   df   p-value
─────────────────────────────────────────────────
Spatial error:           |
  Moran´s I              |   5.149      1    0.000
  Lagrange multiplier        2.575      1    0.109
  Robust Lagrange multiplier 1623.133   1    0.000

Spatial lag:
  Lagrange multiplier      481.086      1    0.000
  Robust Lagrange multiplier 2101.643   1    0.000
```

```
Diagnostic tests for spatial dependence in OLS regression

Fitted model
─────────────────────────────────────────────────
lnProts = dpSet3959 + Nazi + dpJews3959 + lnSlu39 +
          lnTer39 + lnPopU39 + lnPopT89 + Gulag + Lat +
          Long + gdefInd + dlogpop3959
─────────────────────────────────────────────────

Weights matrix
─────────────────────────────────────────────────
Name: S
Type: Distance-based (binary)
Distance band: 0.0 < d <= 1900.0
Row-standardized: Yes

Diagnostics
─────────────────────────────────────────────────
Test                     | Statistic   df   p-value
─────────────────────────────────────────────────
Spatial error:           |
  Moran´s I              |   7.926      1    0.000
  Lagrange multiplier        8.825      1    0.003
  Robust Lagrange multiplier 2.086      1    0.149

Spatial lag:
  Lagrange multiplier       51.652      1    0.000
  Robust Lagrange multiplier 44.912     1    0.000
```

Table A.3.13.: Correlates of main dependent variables with my settler variables, by region

	Host regions		Origin regions	
	Exiled	Rehabilitated	Exiled	Rehabilitated
All:				
Log all deportees '59	−0.183	−0.332**	0.618***	0.465***
Log all deportees '70	−0.234	−0.566***	0.648***	0.502***
Log all deportees '79	−0.267*	−0.556***	0.653***	0.516***
Log all deportees '89	−0.316**	−0.516***	0.644***	0.512***
Exiled:				
Log exiled 59	−0.340**	−0.0607	0.660***	0.464***
Log exiled 70	−0.381**	−0.0871	0.642***	0.492***
Log exiled 79	−0.422***	−0.0457	0.651***	0.510***
Log averted deportation '89'	−0.475***	0.0278	0.644***	0.510***
Rehabilitated:				
Log rehabilitated '59	0.0858	−0.326**	0.143	0.359***
Log rehabilitated '70	−0.0952	−0.662***	0.554***	0.694***
Log rehabilitated '79	−0.0976	−0.641***	0.518***	0.670***
Log returnees '89'	−0.0703	−0.604***	0.436***	0.558***

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Correlates with the change in respective settler variable from 1939 to 1959.

Table A.3.14.: Robustness: Secessionist voting in the 1991 referendum, origin regions

	Robustness checks				
	(1) OLS	(2) IV	(3) SDEM	(4) SDEM-IV	(5) SDM-IV
Log avoided deportation '89'	−1.165	−0.457	−0.995**	−0.661	−0.582
	(1.688)	(1.402)	(0.483)	(0.530)	(0.569)
Log returnees '89'	0.079	−0.132	0.139	−0.041	−0.053
	(0.067)	(0.092)	(0.090)	(0.082)	(0.087)
Log Russians '89	−0.058	−0.179	−0.706***	−0.530***	−0.527***
	(0.292)	(0.266)	(0.213)	(0.199)	(0.201)
Polarization index '89	−1.018***	−1.242***	−1.099*	−0.338	−0.320
	(0.312)	(0.335)	(0.611)	(0.550)	(0.547)
Log between-group IA, avoided dep. '89'	1.287	0.703	0.682	0.594	0.555
	(1.757)	(1.446)	(0.432)	(0.502)	(0.526)
By employment:					
Log white-collar returnees '89	0.174	−0.258	0.553	1.161	1.162
	(0.712)	(0.770)	(0.645)	(0.741)	(0.767)
Log blue-collar returnees '89	0.415	0.491	−0.454	−1.069	−1.088
	(0.657)	(0.666)	(0.708)	(0.825)	(0.843)
Log kolkhozniki returnees '89	−0.057	−0.099	−0.018	−0.073	−0.069
	(0.097)	(0.071)	(0.116)	(0.126)	(0.127)
Spatial lag: Dependent Variable			0.252	−0.318	−0.391*
			(0.288)	(0.220)	(0.227)
Geogr. and violence controls	✓	✓	✓	✓	✓
Observations	43	43	43	43	43
R^2	0.60	0.49			
Pseudo R^2			0.19	0.36	0.37
Chi-squared		173.435	54.674	27.519	27.425
Overall model significance	0.005	0.000	0.000	0.070	0.095

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. All specifications contain a constant term, the German Occupation Dummy, Change in Percent of Jewish Pop. '39 to '59, Log Perc. of the Russian population in 1989, as well as controls for log urban population 1939, log total population in the indicated year, the longitude and latitude of the oblast capital, controls for growth in both the defense industry (Growth Defense Industry '39 to '59 less relocated defense facilities) and penal labor camps (Gulags). It further includes to the log of the total population loss '39-'59. Dependent variable is the inverted (!) log percentage of votes in favor of preserving the Soviet Union in 1991, that is the secessionist voting behavior.

Table A.3.15.: SDEM-IV spillovers for Secessionist voting in the 1991 referendum, origin regions

	(1) Direct	(2) Indirect	(3) Total
Log returnees '89'	−0.041	0.006	−0.035
	(0.083)	(0.014)	(0.069)
Log avoided deportation '89'	−0.667	0.096	−0.571
	(0.536)	(0.099)	(0.457)
Log Russians '89	−0.536**	0.077	−0.459**
	(0.201)	(0.055)	(0.175)
Polarization index '89	−0.341	0.049	−0.292
	(0.554)	(0.072)	(0.487)
Log white-collar returnees '89	1.172	−0.169	1.004
	(0.757)	(0.181)	(0.603)
Log blue-collar returnees '89	−1.080	0.155	−0.925
	(0.841)	(0.184)	(0.679)
Log kolkhozniki returnees '89	−0.074	0.011	−0.063
	(0.128)	(0.021)	(0.108)
Log between-group IA, avoided dep. '89'	0.600	−0.086	0.514
	(0.508)	(0.091)	(0.435)

Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table A.3.16.: Robustness: Protesting and rioting 1987-92, origin regions

	Robustness checks				
	(1) OLS	(2) IV	(3) SDEM	(4) SDEM-IV	(5) SDM-IV
Log avoided deportation '89'	3.810**	3.573*	3.475***	3.436***	3.221***
	(1.762)	(1.881)	(0.869)	(0.861)	(0.973)
Log returnees '89'	−0.171	−0.100	−0.330**	−0.357**	−0.289*
	(0.198)	(0.360)	(0.148)	(0.149)	(0.160)
Log Russians '89	−0.957*	−0.916**	−0.936***	−0.913***	−0.904***
	(0.500)	(0.406)	(0.348)	(0.348)	(0.342)
Polarization index '89	1.678*	1.752**	1.463*	1.571*	1.085
	(0.925)	(0.744)	(0.861)	(0.825)	(0.890)
Log between-group IA, avoided dep. '89'	−3.464**	−3.269**	−2.910***	−2.859***	−2.804***
	(1.605)	(1.659)	(0.825)	(0.814)	(0.900)
By employment:					
Log white-collar returnees '89	3.660	3.804*	2.505**	2.611**	2.591**
	(2.356)	(1.955)	(1.134)	(1.130)	(1.275)
Log blue-collar returnees '89	−3.179	−3.204*	−2.117	−2.233*	−2.141
	(2.323)	(1.787)	(1.293)	(1.295)	(1.422)
Log kolkhozniki returnees '89	−0.893***	−0.879***	−0.646***	−0.654***	−0.646***
	(0.239)	(0.202)	(0.203)	(0.201)	(0.216)
Spatial lag: Dependent Variable			0.111	0.173	−0.152
			(0.221)	(0.237)	(0.253)
Geogr. and violence controls	✓	✓	✓	✓	✓
Observations	43	43	43	43	43
R^2	0.77	0.77			
Pseudo R^2			0.78	0.78	0.79
Chi-squared		307.506	231.730	251.883	163.108
Overall model significance	0.000	0.000	0.000	0.000	0.000

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. All specifications contain a constant term, the German Occupation Dummy, Change in Percent of Jewish Pop. '39 to '59, Log Perc. of the Russian population in 1989, as well as controls for log urban population 1939, log total population in the indicated year, the longitude and latitude of the oblast capital, controls for growth in both the defense industry (Growth Defense Industry '39 to '59 less relocated defense facilities) and penal labor camps (Gulags). It further includes to the log of the total population loss '39-'59. Dependent variable is the log number of protests and riots between 1987 and 1992 based on Beissinger (2002).

Table A.3.17.: SDEM-IV spillovers for Protesting and rioting 1987-92, origin regions

	(1) Direct	(2) Indirect	(3) Total
Log returnees '89'	−0.358*	−0.038	−0.397
	(0.152)	(0.072)	(0.214)
Log avoided deportation '89'	3.448***	0.369	3.817***
	(0.859)	(0.575)	(1.047)
Log Russians '89	−0.916**	−0.098	−1.014*
	(0.348)	(0.154)	(0.397)
Polarization index '89	1.576	0.169	1.745
	(0.832)	(0.303)	(1.030)
Log white-collar returnees '89	2.620*	0.280	2.900
	(1.144)	(0.504)	(1.505)
Log blue-collar returnees '89	−2.241	−0.240	−2.480
	(1.308)	(0.455)	(1.645)
Log kolkhozniki returnees '89	−0.656**	−0.070	−0.726**
	(0.203)	(0.117)	(0.272)
Log between-group IA, avoided dep. '89'	−2.869***	−0.307	−3.176***
	(0.812)	(0.478)	(0.956)

Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table A.3.18.: Robustness: Secessionist voting in the 1991 referendum, host regions

	Robustness checks				
	(1) OLS	(2) IV	(3) SDEM	(4) SDEM-IV	(5) SDM-IV
Log exiled '89'	0.113	0.128	−0.105	−0.103	−0.068
	(0.296)	(0.316)	(0.277)	(0.257)	(0.250)
Log rehabilitated '89'	−0.015	−0.574	−0.070	−0.068	−0.074
	(0.072)	(0.599)	(0.062)	(0.062)	(0.060)
Log Russians '89	0.306	0.577	0.163*	0.160**	0.200**
	(0.219)	(0.407)	(0.084)	(0.081)	(0.082)
Polarization index '89	−0.160	−0.103	−0.524*	−0.513**	−0.498**
	(0.641)	(0.610)	(0.279)	(0.241)	(0.233)
Log between-group IA, exiled '89'	−0.141	0.025	0.122	0.121	0.131
	(0.262)	(0.372)	(0.280)	(0.260)	(0.253)
By employment:					
Log white-collar settler '89	−0.670	0.186	0.154	0.154	0.188
	(0.449)	(0.965)	(0.311)	(0.310)	(0.302)
Log blue-collar settler '89	−0.030	−0.198	−0.517*	−0.520*	−0.516*
	(0.400)	(0.414)	(0.305)	(0.299)	(0.289)
Log kolkhozniki settler '89	−0.137	−0.124	−0.048	−0.048	−0.039
	(0.086)	(0.082)	(0.052)	(0.051)	(0.050)
Spatial lag: Dependent Variable			0.158***	0.162***	0.000
			(0.058)	(0.059)	(0.104)
Geogr. and violence controls	✓	✓	✓	✓	✓
Observations	55	55	55	55	55
R^2	0.80	0.69			
Pseudo R^2			0.87	0.87	0.88
Chi-squared		466.675	344.740	362.776	401.271
Overall model significance	0.000	0.000	0.000	0.000	0.000

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. All specifications contain a constant term, the German Occupation Dummy, Change in Percent of Jewish Pop. '39 to '59, Log Perc. of the Russian population in 1989, as well as controls for log urban population 1939, log total population in the indicated year, the longitude and latitude of the oblast capital, controls for growth in both the defense industry (Growth Defense Industry '39 to '59 less relocated defense facilities) and penal labor camps (Gulags). It further includes to the log of the total population loss '39-'59. Dependent variable is the inverted (!) log percentage of votes in favor of preserving the Soviet Union in 1991, that is the secessionist voting behavior.

Table A.3.19.: SDEM-IV spillovers for Secessionist voting in the 1991 referendum, host regions

	(1) Direct	(2) Indirect	(3) Total
Log rehabilitated '89'	−0.069	−0.009	−0.078
	(0.062)	(0.008)	(0.069)
Log exiled '89'	−0.103	−0.014	−0.117
	(0.258)	(0.036)	(0.293)
Log Russians '89	0.161*	0.021	0.182*
	(0.082)	(0.012)	(0.091)
Polarization index '89	−0.515*	−0.069	−0.583*
	(0.241)	(0.039)	(0.270)
Log white-collar settler '89	0.155	0.021	0.175
	(0.312)	(0.043)	(0.353)
Log blue-collar settler '89	−0.522	−0.070	−0.592
	(0.300)	(0.049)	(0.341)
Log kolkhozniki settler '89	−0.048	−0.006	−0.054
	(0.052)	(0.007)	(0.059)
Log between-group IA, exiled '89'	0.121	0.016	0.138
	(0.261)	(0.037)	(0.298)

Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table A.3.20.: Robustness: Protesting and rioting 1987-92, host regions

	Robustness checks				
	(1) OLS	(2) IV	(3) SDEM	(4) SDEM-IV	(5) SDM-IV
Log exiled '89'	−2.074	−2.039	−0.835	−0.872	−0.978
	(1.706)	(1.285)	(0.821)	(0.841)	(0.822)
Log rehabilitated '89'	0.014	−1.305	−0.252	−0.233	−0.146
	(0.348)	(1.228)	(0.200)	(0.195)	(0.193)
Log Russians '89	0.178	0.817	0.394	0.441*	0.386
	(0.394)	(0.657)	(0.280)	(0.263)	(0.254)
Polarization index '89	−0.097	0.039	−0.517	−0.624	−0.377
	(0.599)	(0.812)	(0.811)	(0.786)	(0.775)
Log between-group IA, exiled '89'	1.893	2.285*	0.791	0.826	1.072
	(1.729)	(1.263)	(0.829)	(0.846)	(0.837)
By employment:					
Log white-collar settler '89	0.631	2.655	0.078	−0.539	−0.162
	(1.171)	(2.234)	(1.347)	(1.084)	(1.080)
Log blue-collar settler '89	2.079*	1.681	1.466	1.976*	1.825*
	(1.157)	(1.297)	(1.227)	(1.023)	(0.999)
Log kolkhozniki settler '89	−0.460***	−0.428***	−0.215	−0.154	−0.209
	(0.162)	(0.149)	(0.181)	(0.182)	(0.180)
Spatial lag: Dependent Variable			−0.311	−0.518*	−0.253
			(0.232)	(0.273)	(0.304)
Geogr. and violence controls	✓	✓	✓	✓	✓
Observations	55	55	55	55	55
R^2	0.80	0.67			
Pseudo R^2			0.65	0.64	0.66
Chi-squared		421.579	97.339	101.977	113.153
Overall model significance	0.000	0.000	0.000	0.000	0.000

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. All specifications contain a constant term, the German Occupation Dummy, Change in Percent of Jewish Pop. '39 to '59, Log Perc. of the Russian population in 1989, as well as controls for log urban population 1939, log total population in the indicated year, the longitude and latitude of the oblast capital, controls for growth in both the defense industry (Growth Defense Industry '39 to '59 less relocated defense facilities) and penal labor camps (Gulags). It further includes to the log of the total population loss '39-'59. Dependent variable is the log number of protests and riots between 1987 and 1992 based on Beissinger (2002).

Table A.3.21.: SDEM-IV spillovers for Protesting and rioting 1987-92, host regions

	(1) Direct	(2) Indirect	(3) Total
Log rehabilitated '89'	−0.241	0.068	−0.174
	(0.201)	(0.062)	(0.149)
Log exiled '89'	−0.903	0.253	−0.650
	(0.874)	(0.279)	(0.622)
Log Russians '89	0.456	−0.128	0.329
	(0.274)	(0.099)	(0.196)
Polarization index '89	−0.645	0.181	−0.464
	(0.814)	(0.243)	(0.587)
Log white-collar settler '89	−0.557	0.156	−0.401
	(1.128)	(0.343)	(0.793)
Log blue-collar settler '89	2.044	−0.573	1.471*
	(1.079)	(0.436)	(0.737)
Log kolkhozniki settler '89	−0.159	0.045	−0.114
	(0.186)	(0.049)	(0.141)
Log between-group IA, exiled '89'	0.854	−0.239	0.615
	(0.880)	(0.281)	(0.623)

Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

B | Appendix to Chapter 2

B.1. Contextual information

Origins & Activities of the Okhrana

The workforce at Fontanka steadily increased over several decades, with the number of full-time employees growing from 161 in 1895 to 387 in 1914 (Lauchlan 2005, p. 7). In 1883, the "special section" established its Paris office, known as the *Zagranichnaia agentura*, or "Foreign Agency" in English (Zuckerman 1996, p. xiv). This agency played a crucial role in gathering foreign intelligence, and was comprised of 15 intelligence officers who formed a small, elite group within the police (Lauchlan 2005, pp. 48). The personnel at Fontanka could be classified into three distinct categories:

1. The first category consisted of gendarmes and bureaucrats, who served as directors, case officers, interrogators, recruiters or recorders, clerks, and analysts. It is worth noting that the "okhranniki" were the pioneers of modern espionage and invented techniques that were carried forward into the Soviet successor institutions (Andrew and Gordievsky 1990).[1]

2. The second category comprised external agents who were responsible for surveillance. They were also referred to as "handlers" in modern times. They covertly monitored political dissidents and provided protection to government officials or members of the tsarist family. These agents were skilled in the art of surveillance and employed a variety of disguises, such as street vendors, doormen, or cab drivers (Vassilyev 1930, p. 42).

3. The third and final category of personnel at Fontanka were internal agents or "spies." These individuals were either in contact with or infiltrated the political opposition as informants. They represented the most valuable source of information for the political police.

The Okhrana were pioneers in intelligence gathering and developed various innovative methods and technologies. These included fingerprinting and the Bertillon anthropometric system for photographic identification of suspects, as well as code deciphering and phone wiretapping. They also introduced new tools like bulletproof vests, tear gas, and silencer guns, among others. With the convergence of unscrupulous agents and technological advancements, the Okhrana had a formidable arsenal of espionage, disinformation, and intimidation tactics. Regarding data collection, it is estimated that the Okhrana had recorded up to three million names by 1917, including the "Who is Who" in the revolutionary underground. Their list grew rapidly over the years, starting with only 221 names in 1889 and eventually encompassing 13,000 names by 1910. As a result, the Okhrana had intelligence on almost every person who had expressed political views or engaged in activism, making them a significant threat to political opposition (Lauchlan 2005, p. 51). The primary targets of the Okhrana included:

- Emigrants and revolutionary groups both in Russia and abroad, particularly those with ties to European socialist organizations;

- Conspiratorial activity, such as bomb-making factories and underground publishers and forgers of documents like passports and false identities;

- Individuals involved in smuggling weapons and explosives.

The Okhrana's centralized and specialized structure allowed it to operate with remarkable efficiency, even with a relatively small staff. Their "divide and rule" strategy involved infiltrating radical groups, revolutionaries, and

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[1] The Soviet secret police underwent several name changes, although the organization remained consistent. These names include VChK (*Vserossijskaya Chrezvychajnaya komissuya po borbe s kontrrevolutsiej i sabotazhem*, 1917-22); GPU (*Gosudarstvennoe politicheskoe upravlenie*, 1922-23); OGPU (*Obedinennoe gosudarstvennoe politicheskoe upravlenie*, 1923-34); NKVD (*Narodnij komissariat vnutrennikh del*, 1934-46); MGB (*Ministerstvo gosudarstvennoj bezopasnosti*, 1946-53); KGB (*Komitet gosudarstvennoj bezopasnosti*, 1954-91).

liberals alike. Rather than relying on loyal police officers, the Okhrana found it more effective to look for spies among members of the political opposition. This was part of Beletsky's aim of preventing the reunification of Mensheviks and Bolsheviks and his indirect support of Lenin (Andrew and Gordievsky 1990, p. 35). Once arrested, these spies would be recruited to convert committed radicals into loyal Okhrana servants. A series of meticulously coordinated seduction methods were employed for this purpose, including solitary confinement with tea and sympathy, threats of severe punishment (imprisonment, banishment, or execution), and promises of renewed service to a good cause, money, power, and prestige, among others (Lauchlan 2005, pp. 50). Moscow bureau chief Sergei Zubatov is believed to have been the most successful interrogator (Schneiderman 1976, pp. 51).

Furthermore, the Okhrana adopted a nuanced approach towards the opposition, recognizing that it was not a homogenous entity, but rather a collection of distinct factions with varying ideologies and agendas. This allowed them to tailor their tactics and strategies to the specific needs of each group. The socialist revolutionaries, for instance, were divided into sub-groups such as the Bolsheviks, the Mensheviks, the Russian Social Democrats, anarchist Communists, Jewish workers' parties, Polish Socialists, Latvian Social Democrats, Armenian nationalists (Droshak/Dashnaktsutiun), the Georgian Social Revolutionary Federalist Party (Sakartvelo), and the Party of Active Resistance in Finland, among others. The Okhrana's strategy was so effective that it even penetrated and neutralized the Liberal Union of Liberation in 1904-5 (Lauchlan 2005, p. 53). General Alexander Gerasimov, the St. Petersburg Okhrana chief from 1905-9, elaborated on this approach, noting that:

> Without the Internal Agency, the director of the political police is blind. The internal life of a revolutionary organization, acting underground, is a wholly separate world, completely inaccessible to those who do not become members of the organization (Gerasimov 1934, p. 56).[2]

Many Okhrana officers enjoyed this fearsome reputation:

> scattered throughout the country, with its departments, investigation points, and gendarme directorates, patiently listening to the reports of countless spies and scouts, constantly arresting, hanging and deporting, strong in its fund of bottomless human baseness, strong in the amount of blood and tears shed, strong in the annual ten million ruble fund, the Okhrana affected directly and indirectly all the measures of the government ... The Okhrana set the tone ... (Walsh 1958, p. 395, quoting George Kennan)

Contrary to popular belief, there were not numerous Okhranniki and surveillance centers in major cities of the Empire, as stated by Lauchlan (2005, p. 50). In reality, there were no more than a thousand trained Okhranniki in all of Russia, making contrary reports mere hallucinations. Nonetheless, the average revolutionary in St. Petersburg could still be apprehended by the political police within three months, and those operating underground had to assume that their ranks were infiltrated with traitors (Zuckerman 1996, p. 38, footnotes 45, 46, 47). According to former Tsarist Chief of Police Vassilyev:

> Much that was mysterious, enigmatical, and dreadful was associated in the mind of the Russian people with the term Police Department. For great sections of the population this office signified frankly a phantom of terror, of which the most improbable tales were told. Many people seriously believed that in the Police Department the unhappy victims of the Okhrana were dropped through a hole in the floor into the cellar, and there tortured (Vassilyev 1930, p. 37).

Additionally, it's worth noting that the Okhrana's tactics and methods had a profound effect on the mindset and radicalization of key Bolshevik leaders, including Dzerzhinsky, Lenin, and especially Stalin. In fact, by the time of the revolution, the average Bolshevik activist had spent four years in Tsarist prisons or in exile, while the typical Menshevik had been imprisoned or exiled for five years (Figes 1996, p. 124-5). Russian historian Richard Pipes provides further insight on this topic:

> All of them had been shadowed, searched, arrested, kept in jail, and sentenced to exile by the political police of the imperial government. They had battled with the censorship. They had had to contend with agent provocateurs planted in their midst. They knew the system intimately, from the inside, which meant that they also knew its shortcomings and loopholes. Their vision of a proper government was a

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[2] "The internal agency," concludes Okhrana Chief Vassilyev, "was much more dangerous for the enemies of the State than the open spy service of the Okhrana, for by means of it the authorities got to know of the most confidential happenings within the various revolutionary organizations" (Vassilyev 1930, p. 54).

mirror image of the imperial regime's to the extent that what the latter called 'subversion' they labeled "counter-revolution" (Pipes 1979, p. 317).

The government's attempts to eradicate dissidents often had the opposite effect, alienating even moderates like former police chief Lopukhin. He predicted that the government's growing reliance on the security police would only serve to estrange the Russian people from the Tsar.

*When the whole political outlook of the ranks of Corps of Gendarmes boils down to the following propositions: that there are the people and there is the state authority, that the latter is under constant threat from the former, for which reason it is subject to protective measures, and that to execute these measures any means may be used with impunity...as a result [of this bipolar view], the protection of the state as carried out by the Corps of Gendarmes turns into a **war against all of society**, and, in the final analysis, leads to destruction also of state authority, who inviolability can be assured only by a union with society. By widening the gulf between state authority and the people, the police engender a revolution. This is why the activity of the political police is inimical not only to the people; it is inimical to the state as well (Lopukhin 1907, pp. 32, emphasis added).*

Pogroms & the Pale of Settlement

After Alexander II was assassinated in the 1880s, the Okhrana was established and soon after, there were a series of massive social riots with strong anti-Semitic undertones. These events led to the looting of Jewish homes and businesses and the brutal massacre of Jews. The first of these incidents occurred on April 15, 1881, in Elizavetgrad, and quickly spread to other major cities, such as Kiev, Anan'ev, and Kishinev, before reaching the surrounding villages. In May 1881, pogroms took place in Odessa, Nikolayev, Aleksandrov, and Romny, while others followed in November 1881 in Odessa and in December in Warsaw. In the spring of 1882, there were signs of a repeat of the 1881 events, with a second wave in Anan'ev in March and in Borispol, Dubossary, and Pereiaslavl in June-July. Official data cited in Ruud and Stepanov (1999) shows that 259 pogroms occurred between 1881 and 1882, with 219 of them taking place in villages and hamlets. In 1883, further clashes took place in Rostov-on-Don, Ekaterinoslav, and Krivoy Rog, and in 1884, in Nizhniy Novgorod. In 1891, nearly thirty thousand Jews were suddenly expelled from Moscow for Passover, setting a precedent for Stalin's later deportations of other ethnic minorities on a larger scale (Schneiderman 1976, p. 210).

In April 1903, Kishinev experienced violent anti-Jewish attacks that resulted in 45 deaths, over 400 injuries, and the destruction of countless Jewish homes and businesses. The Okhrana's alleged complicity in the pogrom, coupled with the anti-Semitic views of the Minister of Interior Vyacheslav von Plehve, reinforced the belief of official involvement in the tragedy. The police officials often linked Jews with Freemasonry, either directly or indirectly (Judge and Mendel 1992, pp. 72; Daly 2004, p. 120). The Kishinev pogrom served as a reminder of the Jewish community's vulnerability to popular and official anti-Semitism (Shtakser 2014, p. 105). For both the organizers of the pogrom and the Jews who experienced it, along with the subsequent pogroms during the Revolution of 1905, it was an attempt to suppress the Jewish population's newfound political assertiveness and keep them subjugated. The widespread involvement of peasants and urban workers in the pogroms had a profound emotional impact on the political identity of Jewish revolutionaries (Shtakser 2014, p. 105). One Bundist, Solomon Gillerson, the son of a failed small merchant who became a quality examiner in a wood factory in Riga, described the Kishinev pogrom in vivid detail:

> This pogrom shocked me profoundly. I saw that under conditions of lawlessness and oppression, I, being a Jew, had no moral right to start a family or to have children, since with the next Jewish pogrom organized by the State Police Department, my wife and children might be tortured and killed, like those 2000 women, children and old people who were victims of the Kishinev pogroms (Shtakser 2014, p. 58).

Ezra Mendelsohn wrote about the conditions in the Pale of Settlement:

> intellectuals [who] were no longer able to identify with the old Jewish culture, nor free to become assimilated into Russian life [...] could at least identify with 'the people', the peasantry or the proletariat (Mendelsohn 1970, p. 29)

The last head of the Okhrana, A.T. Vassilyev, self-righteously condemned as "base slander" "excited newspaper articles" in the West that accused the Tsarist government and the Okhrana of conniving at the pogroms. He explained in his memoirs that the "core of the evil" was "unfortunate inaptitude of the Jews for healthy productive work:

> The government would never have had the slightest reason to adopt measures directed against the Jews had not these been rendered imperative by the necessity for protecting the Russian population, and especially the peasants .... There was a certain kind of of oppression of the Jews in Russia, but, unfortunately, this was far from being as effective as it ought to have been. The Government did seek to protect the peasants from ruthless exploitation of the Jews, but it action bore only too little fruit (Vassilyev 1930, ch. 6)

B.2. Figures

Figure B.2.1.: Pale of Settlement in 2022 borders
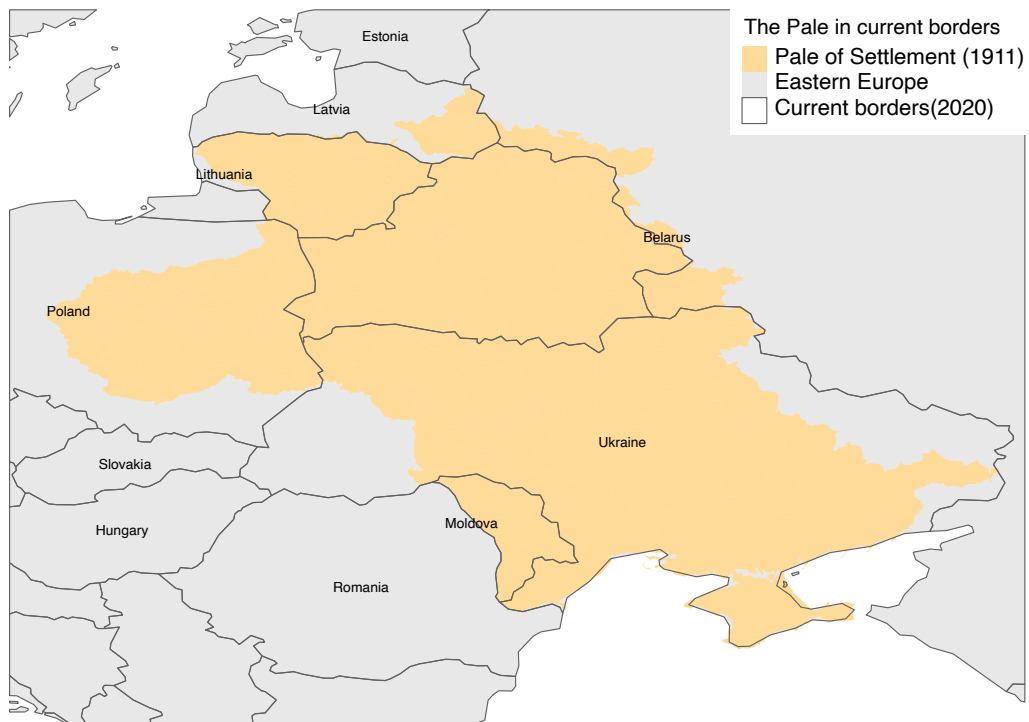
Data source: Eurostat GISCO database (Countries 2020), Kessler (2017)

Figure B.2.2.: Eastern Front at the time of Russian Revolution 1917
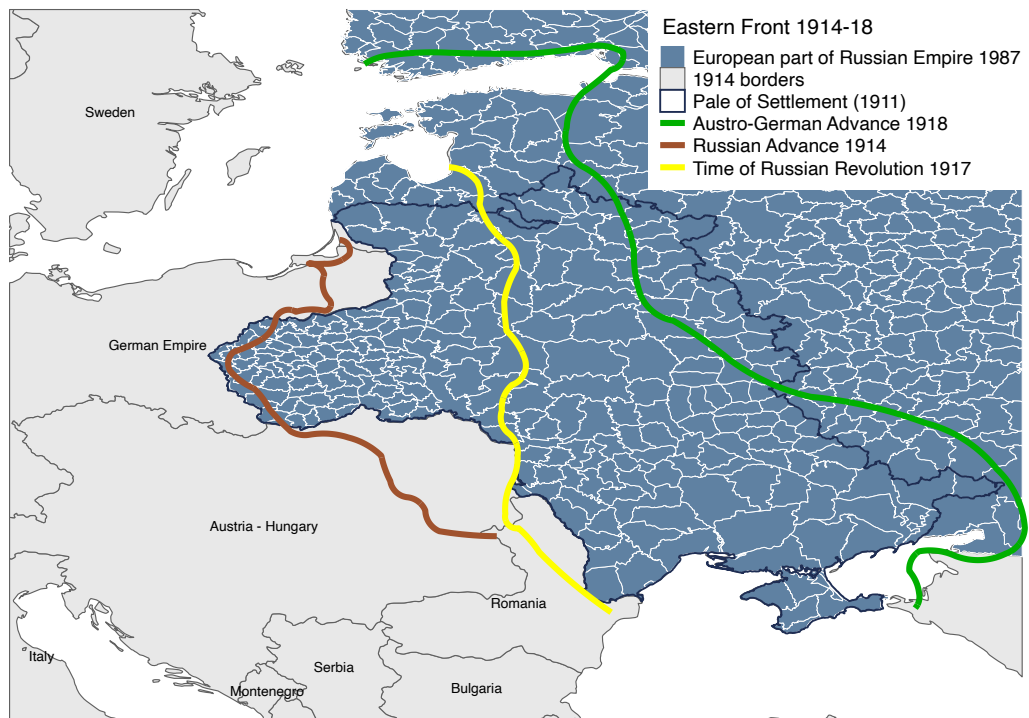
Data source: Kessler(2017), Transcultural Empire (2017), Encyclopædia Britannica (World War I)

Figure B.2.3.: Arzamas project – Who are you in 1917 Russia?
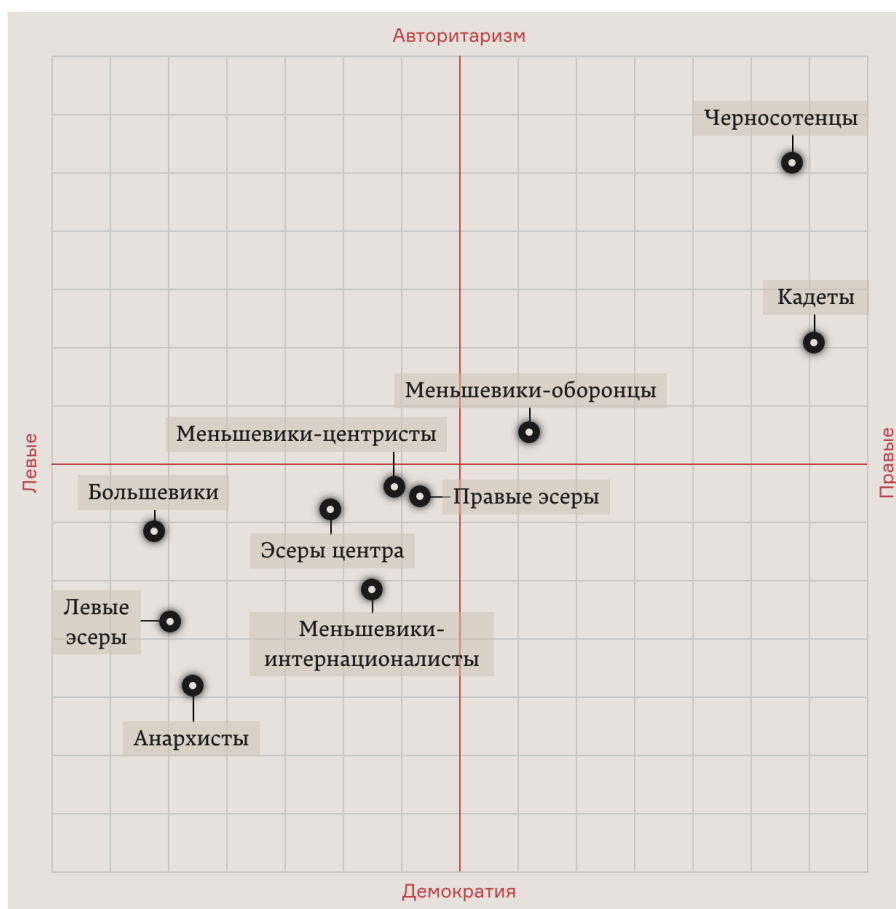
Data source: Arzamas Project – Who are you in 1917 Russia? https://arzamas.academy/materials/1269

B.3. Tables

Table B.3.1.: Data Description and Sources

Variable	Description	Source
Dependent variables and political relevant variables		
rile_wmin	The left-right position of the most leftist party at the election.	Manifesto Project Election Level Do-file Documentation, version 1.0, Protasov et al. (2014).
rile_wmax	The left-right position of the most rightist party at the election.	Manifesto Project Election Level Do-file Documentation, version 1.0, Protasov et al. (2014).
rile_wmean	The mean left-right position weighted by the parties' vote share (also known as the ideological center of gravity (Gross and Sigelman 1984)). It is calculated according to the following formula: $wmean = \sum_{i=1}^{n}(\frac{V_i}{T} * p)$, with T as the sum of vote share at the election (sum_pervote), V_i a party's vote share and p_i a party's left-right position.	Manifesto Project Election Level Do-file Documentation, version 1.0, Protasov et al. (2014).
rile_polarization	The left-right polarization of the party system calculated according to the formula by Dalton (2008): $polarization = \sqrt{\sum_{i=1}^{n}\left(\frac{p_i - wmean}{100}\right)^2 * \frac{V_i}{T}}$, where pol is the polarization index ranging from 0 to 1, p_i is a party's left-right position, V_i is a party's vote share and $wmean$ the weighted left-right mean (rile_wmean.	Manifesto Project Election Level Do-file Documentation, version 1.0, Protasov et al. (2014).
medparty_*	A dummy variable, coded as 1 if a party is a median party and 0 if not. The median party is calculated by ranking the party's votes and calculating the row median. A party is coded as a median party if its rank corresponds to the row median. Different parties with the same left-right position (e.g. alliances) are treated as one party with the cumulative vote share.	Manifesto Project Election Level Do-file Documentation, version 1.0, Protasov et al. (2014).
pervote_*	Percentage of votes gained by each party. In the case of mixed electoral systems with a proportional and majoritarian component, pervote indicates the vote share in the proportional component. In the case of an electoral coalition where programs for all members of the coalition and the coalition were coded, -pervote- was coded MISSING if the dataset includes entries for all seat-winning members of the coalition. If the data set includes, however, only the programs of some coalition members, pervote reports the vote share gained by the alliance and pervote is set to MISSING for the coalition members. As a result, the sum of pervote is not higher than 100%	Manifesto Project Election Level Do-file, version 1.0, Protasov et al. (2014).
constituency	The names of the constituencies in the 1917 Constituency Assembly, that we encode for statistical analysis	Protasov et al. (2014).
sum_pervote	The sum of vote shares won by the parties covered in the 1917 Constituency Assembly	Protasov et al. (2014).

Variable	Description	Source
Okhrana variables		
`investigated_sumdis`	This is our overall repression index, that we label "Okhrana". It is the share of all individuals under investigation in a district. It is calculated from individual level data on the province level, that we weight with district level population data from `www.demoscope.ru`.	Based on Grigoriadis (2023), `www.demoscope.ru`
`male_sumdis`	Share of individuals under investigation in a given district, that are male. This indicator is a dummy variable, that takes on the value of 1 if monitored individual is male, 0 otherwise. It is calculated from individual level data on the province level, that we weight with district level population data from `www.demoscope.ru`.	Based on Grigoriadis (2023), `www.demoscope.ru`
`propaganda_sumdis`	Share of individuals under investigation for distributing anti-governmental propaganda. Anti-government propoganda is defined as the non-violent printing and distributing of any such material as recorded by the Okhrana. It is calculated from individual level data on the province level, that we weight with district level population data from `www.demoscope.ru`.	Based on Grigoriadis (2023), `www.demoscope.ru`
`membership_sumdis`	Share of individuals under investigation for membership in anti-governmental organization. Anti-government membership is defined as the non-violent participation in nationalist or labor movements as recorded by the Okhrana. It is calculated from individual level data on the province level, that we weight with district level population data from `www.demoscope.ru`.	Based on data from Grigoriadis (2023), `www.demoscope.ru`
`riots_sumdis`	Share of individuals under investigation for inciting riots. Riots are defined as the violent participation in anti-governmental demonstrations as recorded by the Okhrana. It is calculated from individual level data on the province level, that we weight with district level population data from `www.demoscope.ru`.	Based on data from Grigoriadis (2023), `www.demoscope.ru`
`assassinations_sumdis`	Share of individuals under investigation for participation in the planning and executing of assassintions of governmental members or the Tsarist family as recorded by the Okhrana. It is calculated from individual level data on the province level, that we weight with district level population data from `www.demoscope.ru`.	Based on Grigoriadis (2023), `www.demoscope.ru`

Variable	Description	Source
Demographic, geographic and middlement control variables		
sh_ind_workers_1897	Share of individuals employed or self-employed in mining and quarrying, metal smelting, fiber processing, animal products processing, wood processing, metal processing, mineral processing, chemical and allied products manufacturing, distilling, brewing and honey fermentation, other beverages manufacturing, and fermented materials manufacturing; vegetable and animal food processing; tobacco and tobacco products manufacturing; printing; instrument making; jewelry making, painting, cultural and luxury goods manufacturing; garment manufacturing; housing construction, repair and maintenance, and general construction; wagon building and wooden ship building; other industrial workers	Similar to Buggle and Nafziger (2021), categories 21 to 40 from G. Kessler and Markevich (2017) after district population weighting.
sh_agri_workers_1897	Share of individuals employed in agriculture, sericulture and livestock farming	Categories 17 to 19 from G. Kessler and Markevich (2017)
sh_slavsl_1897	Share of speakers of East Slavic languages (Russian, Ukrainian and Belorussian)	G. Kessler and Markevich (2017)
sh_jewsl_1897	Share of Yiddish speakers in a district in 1897. It is calculated from the provincial level data from G. Kessler and Markevich (2017) and weighted by the district-level population from histmat.info.	G. Kessler and Markevich (2017), www.demoscope.ru
educ_*_1897	Share of individuals either with primary, secondary or tertiary education. It is calculated from the provincial level data from G. Kessler and Markevich (2017) and weighted by the district-level population from histmat.info.	G. Kessler and Markevich (2017), www.demoscope.ru
gender_balance_1913_7	It is the change in the sex ratio between 1913 and 1917 in order to account for the mobilization of males in World War I, that is calculated as the difference in the number of males relative to females in 1913 (sex ratio 1913) less the change in the males relative to females in 1917 (sex ratio 1917) over the sex ratio in 1917 & 1913 and 1917	Statistical Yearbooks obtained from histmat.info.
sh_jews_crafts, sh_jews_credit, sh_jews_trd, sh_jews_trns, sh_jews_nagr_trd, sh_jews_trd_gnrl, sh_jews_trd_gr, sh_otherethnic_credit, sh_otherethnic_trd_gr	These are variables, that we obtained from the replication data set of Grosfeld, Sakalli, et al. (2020). They describe the integration of Jews in Imperial Russia into the countryside.	Data set taken: *complete_data_grid from Grosfeld, Sakalli, et al. (2020)

Variable	Description	Source
`latitude, longitude, coal_terr, podzol_soil, distance_coastline, length_gs globdist_provcapital, globdist_stpetersburg, serf_100`	These are variables, that we obtained from the replication data set of Buggle and Nafziger (2021). They describe the integration of Jews in Imperial Russia into the countryside.	Data set taken: `*district_level` from Buggle and Nafziger (2021)

Table B.3.2.: Party lists and party grouping

Party (Russian)	Party (English)	Group assignment
”Возрождение свободной России”	Revival of Free Russia	Rightist
”Земля и воля трудовому народу”Совет крестъянских депутатов, солдат	Soviet of PD	Soviet of PD
”Земля и воля”Партия социалистов/революционеров, Совет крестъянских депутатов	SRs, Soviet of PD	SRs, Soviet of PD
”Собружество народов”	Community of Peoples	Popular Socialists
Амурское и Уссурийское казачество	Amur, Ussuri Cossacks	Cossacks
Армянская народная партия	Armenian Nat. Party	Armenian Populists
Армянская революционная партия ”Дашнакцутюн”	Dashnaks	Armenian SRs
Башкиры/федералисмы	Bashkir Federalists	Bashkir Federalists
Без названия	Unknown	Unknown
Безпартийные крестъяанский союз	Non-partisan Peas. Union	Peasant lists
Белоруссказе народная громада в Калуге	Belorussian Socialist Gromada	Belorussian Socialist Gromada
Белорусские огранизации	Belorussian Socialist Gromada	Belorussian Socialist Gromada
Беспартийные служащих и служивших в правителъственных и общественных учреждениях	Non-partisan Group of Public Servants	Non-partisan Group of Public Servants
Беспартийная группа земелъных собственников	Non-partisan Landowners	Non-partisan Landowners
Беспартийные крестъяне/хлеборобы	Non-partisan Peas.-Farmers	Peasant lists
Бессарабская Трудовая народно/социалистическая партия	Popular Socialists	Popular Socialists
Блок ”Селянской спилки Крестъянский союз, Совет крестъянских депутатов, Украинский социал/демоктратическуй рабочая партия	Peas. Union, Soviet of PD, Ukrainian SDs	Peas. Union, Soviet of PD, Ukrainian SDs
Блок Иркутской группы сибирских областников/автономистов и Иркутской группы Трудовой народно/социалистической партии	Popular Socialists	Popular Socialists
Блок Киргизской партии ”Алаш>, дгугие мусулъмансие области, Казачъе войско	Bloc of the Kirghiz Party Alash, other Muslims (Alash-Semirechie Cossack Host)	Alash Orda
Блок Кооператоры, Всероссийская социал/деморкатическая организования ”Единство Народные социалисты Валковского уезда	Cooperatives, SDs, Popular Socialists	Right-wing socialist bloc
Блок Партии трудовиков/народных социалистов, Украинская партия социалистов/федералистов	SRs, Ukrainian SRs	SRs, Ukrainian SRs
Блок Партия народной свободы, Торгово/промышленная группа	Kadets	Kadets

Continuation of table B.3.2

Party (Russian)	Party (English)	Group assignment
Блок Союз земелъных собственников, Группа старообрядцев всех согласий	Bloc of Landowners, Old Believers	Landowners
Блок Трудовой народно/социалистической партии, Украинской партии социалистов/федералистов	SRs, Ukrainian SRs	SRs, Ukrainian SRs
Блок Украинской партии социалистов/революционеров, Украинской селянской спилки, Украинской социал/демократической рабочей партии	Ukrainian SRs	Ukrainian SRs
Блок болъшевиков, социал/демокраии Полъшии Литвы	Bolsheviks	Bolsheviks
Блок кооператоров, Трудовая народно/сосиалистийеская партия	Bloc of cooperatives, popular socialists	Bloc of cooperatives, popular socialists
Блок националъностей	Nat.ist Bloc	Other
Блок объединенных кредитных и потребипелъных кооперативов, Союз земских служащих, Трудовая народно/сосиалистийеская партия	Bloc of United Credit, Consumer Cooperatives, Union of Zemstvo Employees, Popular Socialists	Right-wing socialist bloc
Блок социалистов	Socialist Bloc	Right-wing socialist bloc
Блок социалистов города Верного всех партий, Совет крестъянских депутатов, Совет солдатских и рабочих депутатов, Киргизская социалистическая партия	Bloc of Socialists of Vernogo Town, Soviet of PD, Soviet of Soldiers, Workers Deputies, Kirghiz Socialist Party "Fukhara" (SRs, Mensheviks)	SRs
Блок украинскох националъно/репсубликанских групп и организаций	Ukrainian Nat. Republican Group	Ukrainian non-socialists
Бунд	Bund	Bund
Бурятский националъный комитет в Забайкалъской области	Buryat Nat. Committee, SRs	Buryat Nat. Committee
Бурятский националъный список	Buryat Nat. List	Buryat Nat. List
Витебский Белорусский народны союз и Союз православных и едиоверческих приходов Полоцкой губернии	Vitebsk Belorussian People's Union, Orthodox Parishes of the Faith of the Polotsk Diocese	Orthodox
Вологодский губернский комитет Российской социал/демогратической рабочей партии и социал/демогратическая фракция Вологдского	Mensheviks-Centrists	Mensheviks-Centrists
Временный крымско/мусулъманский исполнителъный комитет	Interim Crimean/Muslim Executive Committee executive committee	Other Muslim lists
Всероссийская социал/деморкатическая организования "Единство"	Unity	Unity
Всероссийская социал/деморкатическая организования "Единство Союз кооператоров и народные социалисты	Unity	Unity
Всероссийская социал/деморкатическая организования "Единство Союз кредитных и ссудо/сберегателъных товариществ	Unity, Union of Credit, Savings Associations	Unity, Union of Credit, Savings Associations

Party (Russian)	Party (English)	Group assignment
Всероссийская союз земельных собственников	Union of Landowners	Union of Landowners
Всероссийская союз торговлъ и промышленностъ	Comm.-Indust. Union	Comm.-Indust. Union
Всероссийский крестъянский союз	All Russian Peas. Union	Peasant lists
Всероссийской лиги равноправия женщин	All-Russian League for Women's Equality	All Russian League for Women's Equality
Вятский мусулъманский съезд	Muslim Union of Vyatka Governorate	Muslim Union of Vyatka Governorate
Глазовский уездный съезд Совета рабочих, солдатских и крестъянских депутатов	Congr. of the Council of Workers', Soldiers', Peas.' Deputies, Glazovsky u.	Dissident leftist SR lists
Горцы и казаки	Cossacks	Cossacks
Граждане Болецкой волости Городоксого уезда	Citiz. of Boletskii v., Gorodsky u.	Citiz. of Boletskii v., Gorodsky u.
Граждане Важинской волости Олонецкая уезда	Citiz. of Vazhinskaya v., Olonets u.	Citiz. of Vazhinskaya v., Olonets u.
Граждане Йозефдорфской волости Аккерманского уезда	Citiz. of Josephdorf v., Akkerman u.	Citiz. of Josephdorf v., Akkerman u.
Граждане/хлебообы Отрадовский волости Эмиевского уезда	Citiz. of Otradovo v., Emeevsky u.	Citiz. of Otradovo v., Emeevsky u.
Грузинская национал/демократиыечcкая партия	Georgian Nat. Democrats	Georgian Nat. Democrats
Грузинская революционная партия социалистов/федералистов	Georgian Socialist-Federalists	Georgian Socialist-Federalists
Группа "Селъские кандидаты в единенуу сила"	Peas. List	Peas. List
Группа безпартийных избрателей Спасского уезда	Non-partisan voters in Spassky uezd	Old Believers
Группа внепартийных общественных деятелей	Non-partisan Group of Public Figures	Ukrainian non-socialists
Группа граждан Кушебской волости Холмогроского уезда	Citiz. of Kushebskaya v., Kholmogro u.	Citiz. of Kushebskaya v., Kholmogro u.
Группа граждан народа Вятский губернии, Яранского уезда, Пачинской волости	Citiz. of Pachin v., Yaransk u.	Citiz. of Pachin v., Yaransk u.
Группа еврейских общественных деятелей	Jewish Social Activists	Jewish Social Activists
Группа забайкалъских казаков	Cossacks	Cossacks
Группа земских деятелей	Employees of Government Agencies	Employees of Government Agencies
Группа избирателей	Unknown	Unknown
Группа избирателей, сочувствующих Народно/социлистической трудовой партии	Popular Socialists	Popular Socialists

Continuation of table B.3.2

Party (Russian)	Party (English)	Group assignment
Группа кооператоров Бессарабской губернии	Cooperative Group	Cooperatives
Группа крестъян Воробъевского избирателъного участка Сумского уезда	Peas. of Sumy u.	Peas. of Sumy u.
Группа крестъян/земледелъцев безпартийных	A group of nonpartisan Peas., landowners	Landowners
Группа левых социалистов/революционеров интернационалистов	Leftist SRs	Dissident leftist SR lists
Группа мусулъман девяти уездов	Muslim Group	Muslim Group
Группа населения Старобелъского уезда	Citiz. of Starobel u.	Citiz. of Starobel u.
Группа нишеоднисавшихся заявителей по Южновскому уезды Смоленской губернии, Крестъянская народно/социалистическая партия	Group of niche applicants, Popular Socialists	Group of niche applicants, Popular Socialists
Группа обзщественных деятелей	Group of Public Figures	Rightist
Группа ревнителей православия	Group of Orthodox zealots	Orthodox
Группа старообрядцев всех согласий	Old Believers	Old Believers
Группа старообрядцев всех согласий, город Новочеркасска	Old Believers	Old Believers
Группа украинцев	Ukrainians	Other Ukrainians
Группа христианского единния за веру и родину	Christian Union for Faith, Fatherland	Rightist
Группа церковно/народная	Church/Popular Group	Orthodox
Губернский съезд крестъянских, рабочих и солдатских депутатов, Партия социалистов/революционеров, Российская социал/демократическая рабочая партия	Congr. of Peas., Soldiers, Workers Deputies, SRs, SDs	Dissident leftist SR lists
Дагестанская социалистическая группа	Dagestan Socialists	Dagestan SDs
Девлеправославные христиане старообрядцы Калужской губернии	Old Orthodox Christians of the Kaluga Province	Orthodox
Демократические везпартийная группа районных комитетов Сергиева Посада	Democratic Non-partisan Group of Members of District Committees of Sergiev Posad	Democratic Non-partisan Group of Members of District Committees of Sergiev Posad
Домовладелъцы и землевладелъцы Новгородской губернии	Landowners	Landowners
Донской союз собственников	Union of Landowners	Union of Landowners
Еврейская социал/демократическая рабочая партия "Идише Фолкспартей"	Folkspartei	Folkspartei
Еврейская социал/демократическая рабочая партия "Идише Фолкспартей Вне-партийный демократический комитет	Folkspartei	Folkspartei
Еврейская социал/демократическая рабочая партия "Поалей Цион"	Poalei Zion	Poalei Zion
Еврейский насионалъный блок	Jewish Nat. Bloc	Jewish Nat. Bloc

Party (Russian)	Party (English)	Group assignment
Еврейский насионалъный избирателъныи комитет	Jewish Nat. Electoral Committee	Jewish Nat. Electoral Committee
Евречцкий список	Jewish List	Jewish List
Кабардинский и балкарский народы и русские население Налъчикского округа	Kabardian, Balkarian people, the Russian population of the Nalchik u.	Kabardian, Balkarian people, the Russian population of the Nalchik u.
Казаки/социалисты	Cossacks, Socialists	Cossacks, Socialists
Казанское губернское мусулъманское собрание	Cossacks	Cossacks
Казачий список	Cossacks	Cossacks
Казачъе войско	Cossacks	Cossacks
Казачъе войско	Cossacks	Cossacks
Киевский военно/репсубликанский союз	Military Revolutionary Union	Military Revolutionary Union
Киргизская партия "Алаш"	Alash Orda	Alash Orda
Киргизские социалисты	Kirgiz Socialists	Kirgiz SRs
Комитет внепартийного влока русских избирателей	Committee of non-partisan Russian voters	Committee of non-partisan Russian voters
Комитет православных и единоверческих проходов Болынской епархии	Committee of Orthodox, Unified Faith Passages of the Bolyn Diocese	Orthodox
Кооперативная группа	Cooperative Group	Cooperatives
Кооперативная группа, Трудовая народно/сосиалистийеская партия	Cooperatives, Popular Socialists, SR Defencists	Right-wing socialist bloc
Кооперативные союзы Новгородской губернии	Union of Cooperativists	Cooperatives
Кооперативы Владимирской губернии	Cooperatives	Cooperatives
Кооперативы Екатеринославской губернии и Трудовая народно/социалисти-ческая партия, "Земля и воля"	Cooperatives, Popular Socialists, SR Defencists	Right-wing socialist bloc
Кооператоры Симбирской губернии	Cooperatives	Cooperatives
Кооператоры и независимые социалисты	Cooperatives	Cooperatives
Коопертивные объединения Оренбургской губернии	Cooperative Organizations	Cooperatives
Кравеой полъский список	Polish List	Polish lists
Красноярский отдел Централъного Сибирского областного комитета	Siberian Autonomist	Popular Socialists, Ukrainian Socialist-Federalists
Крестъяне Битебской губернии	Peas. of Vitebsk Governorate	Peas. of Vitebsk Governorate

Continuation of table B.3.2

Party (Russian)	Party (English)	Group assignment
Крестъянский союз "Крестъянская сила Скбирского уезда	Peas. Union	Peas. Union
Крестъянский список	Peas. List	Peas. List
Крестъянский съезд, Партия социалистов/революционеров	SRs, Peas. Union	SRs, Peas. Union
Крестъянство Мглинского уезда	Peas. of Mglin u.	Peas. of Mglin u.
Крестъяне Бердянского уезда	Peas. of Berdyansk u.	Peas. of Berdyansk u.
Крестъяне Пермского уезда и мордовское население Саратовской губерний	Peas. of Petrovsk u., Mordva Population	Peas. of Petrovsk u., Mordva Population
Латгалъский народний комитет и Ламгалъская социалистическая партия трудового народа	Latgalian Popular Committee, Latgalian Socialist Party of Working People	Latgalian Popular Committee, Latgalian Socialist Party of Working People
Латышские демогкаты/националисты	Social-Democracy of the Latvian Territory	Latvian SD's
Латышские крестъянские союз	Lettish Peas. Union	Lettish Peasant Union
Латышские крестъянские союз, Латышская радикалъно/демократическая партия	Lettish Peas. Union, Lettish Radical Democrats	Rightist
Левые эсеры	Leftist SRs	Dissident leftist SR lists
Мазурское общество Новохоперского уезда Воронежской губернии	Mazury Society of Novokhopersky u.	Other
Могилевская губернская полъская рада	Polish Rada	Polish lists
Молдавская националъная партия, Союз кредитных и ссудо/сберегателъных товариществ	Moldovan Nat. Party, Union of Credit, Savings, Loan Associations	Comm.-Indust. list
Мусулъмане башкиро/татарской группы Пермской губернии	Bashkir-Tatar group	Bashkir-Tatar group
Мусулъмане/демократы	Muslim Democrats	Muslim Democrats
Мусулъмане/социалисты	Muslim Socialists	Muslim Socialists
Мусулъманские Западного Завкавказъя	Muslim Group	Muslim Group
Мусулъманские националъные комитеты	Muslim Nat. Committee	Muslim Nat. Committee
Мусулъманские националъные комитеты и Тюркская демократическая партия федералистов "Мусавет"	Turkic Democratic Federalist Party - Musavat, Muslim Nat. Committee	Turkic Democratic Federalist Party - Musavat and Muslim Nat. Committee
Мусулъманские националъные совет	Muslim Nat. Council	Muslim Nat. Council
Мусулъманские организации	Muslims	Muslims
Мусулъманские социалистический блок	Muslim Socialist Bloc	Muslim Socialist Bloc

Party (Russian)	Party (English)	Group assignment
Мусулъманские социалистический совет	Muslim Socialists	Muslim Socialists
Мусулъманские социалистический список	Muslim Socialists	Muslim Socialists
Мусулъманский список	Muslims	Muslims
Мусулъманское шуро	Muslim Shuro-Islamia	Muslim Shuro-Islamia
Народная трудовая партия Ушицкого уезда	SRs of Ushitzk	SRs of Ushitzk
Националъные блок украинцы, мусулъмане, поляки, литовцы	Nat. Bloc (Ukrainians, Muslims, Poles, Lithuanians)	Nat. Bloc
Нижегородский политический союз старообрядческих согласий	Union of Old Believer Accord	Old Believers
Общегуберенский старообрядческий объединенный комитет	Old Believers' Joint Committee	Old Believers
Общемусулъманский демократический социалистический блок	All Muslim Socialist Bloc	Muslim Socialists
Общественные деятели земцы/государственники прогрессисты/демократы	Landowners, Non-partisan Progr.	Landowners
Общество ”За верз у порядок”	Society for Faith, Order	Rightist
Общество ”Муинулъ/Ислам”	Muinil Islam Society	Muinil Islam Society
Общеферганский	All Fergana List of Soviet of Deputies of Muslim Organizations	Muslim Socialists
Объединенная демократическая группа гогожан, крестъян и рабочих	United Democratic Groups of Townspeople, Peas.,, Workers	Peasant lists
Объединенная еврейская социалистическая рабочая партия	Fareynikte	Fareynikte
Объединенние беспартийных союзов	Unknown	Unknown
Объединенное духовенство и миряне Костромской епархии	Orthodox Clergy, Laymen	Orthodox
Объединенные полъские организации	United Polish Organizations	Polish lists
Объединенные полъские список	United Polish Organizations	United Polish Organizations
Объединенные приходских советов церквей города Ставрополъ	United Orthodox Parishes	Orthodox
Объединенные социалисты	United Socialists	Right-wing socialist bloc
Объединенный областной прогрессивный блок	United Regional Progressive Bloc	Right-wing socialist bloc
Огранизация российских граждан немецкой националъности	Russian Citiz. of German Nat.ity	German lists
Партиз соцуалистов/революционеров и советы Алтайской губернии	SRs, Soviet of PD, left fraction of the Muslim Nat. Soviet	SRs, Soviet of PD, left fraction of the Muslim Nat. Soviet
Партия Мусулъманской России	Party of Muslims in Russia	Party of Muslims in Russia
Партия избирателей украинцев	Ukrainians	Other Ukrainians
Партия мусулъманско/социалистическо/демократическо блока	Party of the Muslim Socialist-Democratic Bloc	Muslim Socialists

Continuation of table B.3.2

Party (Russian)	Party (English)	Group assignment
Партия народной свободы	Kadets	Kadets
Партия народной свободы, Беспартийные хлеборобы	Kadets, Non-partisan landowners	Kadets
Партия соицалистов/революционеров, Совет крестьянских депутатов	SRs, Soviet of PD	SRs, Soviet of PD
Партия социалистов/революционеров	SRs	SRs
Партия социалистов/революционеров (Тула)	SRs of Tula	SRs of Tula
Партия социалистов/революционеров, Калужский общегубернский съезд советов кестъянских депутатов	SRs, Soviet of PD	SRs, Soviet of PD
Партия социалистов/революционеров, Крестъянская союз	SRs	SRs
Партия социалистов/революционеров, Селянская спулка, Украинская социал/демократическая рабочая партия	SRs, Selyanska Spilka, Ukrainian SDs	SRs
Партия социалистов/революционеров, Совет крестъянских депутатов	SRs, Soviet of PD	SRs, Soviet of PD
Партия социалистов/революционеров, Совет крестьянских депутатов, Левая фракция Мусулъманского националъного совета, Мусулъманский совет	SRs, Soviet of PD, left fraction of the Muslim Nat. Soviet	SRs, Soviet of PD, left fraction of the Muslim Nat. Soviet
Партия социалистов/революционеров, Совет крестьянских депутатов, Трудовой казачество	SRs, Soviet of PD, Socialist Cossacks	SRs, Soviet of PD, Socialist Cossacks
Партия социалистов/революционеров, Совет крестьянских депутатов, Украинская партия социалистов/революционистов, Объединенная еврейская социалистическая рабочая партия	SRs, Soviet of PD, United Jewish Socialist Labour Party (S.S., E.S.)	SRs, Soviet of PD, United Jewish Socialist Labour Party (S.S., E.S.)
Партия социалистов/революционеров, Съезды крестьянских, солдатских и рабочих депутатив, Коопертивы	SRs	SRs
Партия социалистов/революционеров, город Владивостока, Николъско/Уссурийского, Спасска Приморской области	SRs of Vladivostok, Nikolayevsk-on-Amur, Spassk (leftist SRs)	Dissident leftist SR lists
Партия хлеборобов/собственников	Party of Farmers, Landowners	Landowners
Петропавловский отдел Всероссийского крестъяанского уезда, Пачинской волости	All-Russian Peas. Union, Pachin v.	Peasant lists
Полномочный общечувашский националъный съезд, чувашские военные комитеты, Партиа социалистиов/революционеров	The All Chuvash Nat. Congr., the Chuvash Military Committees, the Chuvash Organization of the Socialist Revolutionary Party	Chuvash
Полъский избирателъный комитет	Polish Electoral Committee	Polish lists
Полъский краевой список	Polish List	Polish lists

Party (Russian)	Party (English)	Group assignment
Поселяне/греки Мариополъцкогро уесда	Greek Settlement of Mariupol u.	Other
Правослабно/проходской демократический союз	Orthodox Parish Democratic Union	Orthodox
Православие о хлеборобы	Orthodox-Farmers alliance	Orthodox
Православно/народная партия	Clerical People's Party	Orthodox
Православное приходы	Orthodox parishes	Orthodox
Приходская беспартийная группа	Orthodox Followers	Orthodox
Приходские советы, Объединяющие русское православоное население	United Orthodox Parishes	Orthodox
Рабочий комитет суконной фабрика Протопопова	Working Committee of the Protopopov cloth factory	Other
Радикалъно/демократическая партия	Radical Democrats	Rightist
Республиканская демократическая партия	Popular Socialists	Popular Socialists
Российская социал/демократическая рабочая партия	Mensheviks	Mensheviks
Российская социал/демократическая рабочая партия, Бунд, Полъские "Единение"	Mensheviks-Centrists, Bund	Mensheviks-Centrists, Bund
Российская социал/демократическая рабочая партия, Мусулъманская организация "Гуммет"	Mensheviks	Mensheviks
Российская социал/демократическая рабочая партия, болшевиков и интернационалистов	Bolsheviks, Menshevik-Int.	Bolsheviks, Menshevik-Int.
Российская социал/демократическая рабочая партия, болшевиков и интернационалистов, Совет крестъянских депутатов	Bolsheviks, Menshevik-Int.	Bolsheviks, Menshevik-Int.
Российская социал/демократическая рабочая партия, болшевиков и менъшевиков/интернационалистов	Bolsheviks, Menshevik-Int.	Bolsheviks, Menshevik-Int.
Российская социал/демократическая рабочая партия, болъшевиков	Bolsheviks	Bolsheviks
Российская социал/демократическая рабочая партия, болъшевиков, Тулъская комитет поссийская социал/демократическая рабочая партия, Тулъская военная организация российская социал/демократическая рабочая партия, Тулъская организация социал/демократическии Полъшии и Литвы, Тулъская организация социал/демократии Литовского края, Тулъская ограницазия социал/демократии Латышского края	Bolsheviks	Bolsheviks
Российская социал/демократическая рабочая партия, болъшевиков, Эстляндский исполнителъный комитет безземельных и малоземелъных крестъян	Bolsheviks	Bolsheviks

Continuation of table B.3.2

Party (Russian)	Party (English)	Group assignment
Российская социал/демократическая рабочая партия, интерналистов	Menshevik-Int.	Mensheviks
Российская социал/демократическая рабочая партия, интерналистов	Mensheviks-Int.	Mensheviks-Int.
Российская социал/демократическая рабочая партия, менъшевиков	Mensheviks-Centrists	Mensheviks-Centrists
Российская социал/демократическая рабочая партия, менъшевиков и Бунд	Mensheviks-Bund	Mensheviks-Bund
Российская социал/демократическая рабочая партия, менъшевиков/объединенцев	Mensheviks-Centrists	Mensheviks-Centrists
Российская социал/демократическая рабочая партия, менъшевиков/оробонцев	Menshevik-Oborons	Mensheviks
Российская социал/демократическая рабочая партия, объединная	Mensheviks-Centrists	Mensheviks-Centrists
Российская социал/демократическая рабочая партия, объединная, Бунд	Mensheviks-Bund	Mensheviks-Bund
Российская социал/демократическая рабочая партия, объединные интерналистов	Menshevik-Int.	Mensheviks
Русская демократическая партия	Russian Democratic Party	Rightist
Русский народно/государственный союз	Russian Popular State Union	Rightist
Русско/народная партия христиан/старообрядцев всех согласий	Russian People's Party of Christians-Old Believers	Old Believers
Сверхпартийны союз киевлян/прогрессистов	Superpartisan Union of Kievites/Progr.	Superpartisan Union of Kievites/Progr.
Селъскохозяйственная торгово/промышленная группа	Comm.-Indust.	Comm.-Indust.
Селъскохозяйственно/ремесленно/торгого/промышленная группа	Comm.-Indust.	Comm.-Indust.
Сионистская партия	Zionists	Zionists
Сионистская партия	Zionists	Jewish Nat. lists
Совет крестъян местечка Смелого Роменского уезда	Soviet of PD	Soviet of PD
Совет крестъянских депутатов	Soviet of PD	Soviet of PD
Социал/демократия Латвии	Social-Democracy of the Latvian Territory	Latvian SD's
Социалистиеские партии союхз служащих Юга/Западной железной догоги	Socialist Parties of the Southern/Western Railway Workers' Unions	Bolsheviks
Социалистический блок, Украинская партия социалистов/революционеров и Группа сочуствующая Полъской Партии социалистов, Левица	Socialist Bloc: Ukrainian SRs, Polish Party of Socialists, Levica	Ukrainian SRs
Социалисты/федералисты и крестъяне Латгалии, Режицкого/Люцинского и Двинсцкого уехдов	Socialist-Federalists, Peas. of Latgale	Socialist-Federalists and Peasants of Latgale
Союз домовладелъцев Елъца	Landowners	Landowners

Party (Russian)	Party (English)	Group assignment
Союз забайкалъских старообрядцев	Union of Transbaikal Old Believers	Orthodox
Союз земелъных собственников	Union of Landowners	Union of Landowners
Союз земелъных собственников, Беспартмийные пргогрессисмы	Landowners, Non-partisan Progr.	Landowners
Союз земелъных собственников, Общество старообряд/рабочая партия, объединенная, и Бунд	Union of Landowners, Old Believers, Bund	Landowners
Союз земелъных собственников, Хлеборобы	Union of Landowners, Farmers	Union of Landowners, Farmers
Союз землевладелъцев	Union of Landowners	Union of Landowners
Союз землевладелъцев Минской губернии	Union of Landowners	Union of Landowners
Союз крестъян/украинцев, беженцев/уркраинцев, Организация социалистов/революционеров татар	Union of Ukrainian Peas., Ukrainian Refugees, the Organization of Tatar Socialist Revolutionaries	Tatar Socialists
Союз православноро духовенства и мирян	Orthodox Clergy, Laymen	Orthodox
Союз селъских хозяев и посевщиков	Union of Landowners	Union of Landowners
Союз селъских хозяев, Союз земелъных собственников	Homeowners, Landowners	Landowners
Союз селъских хозяев, крестъян/собственников, хуторян и отрубщиков	Union of Landowners, Farmers	Union of Landowners, Farmers
Союз социалистов немцев Поволъжя	Union of Socialists of the Volga German Region	Union of Socialists of the Volga German Region
Союз торговцев, промышленников, ремесленникоф и домовладелъцев Симбирской губернии	Comm.-Indust. Union	Comm.-Indust. Union
Список, название которого не установлено	Unknown	Unknown
Старообрядцы, Беспартийные крестъяне и хлебопашцы	Old Believers, Non-Partisan Peas., Farmers	Old Believers
Таранчинское население Джаркентского уезда	Tarchin population of Jarkent u.	Other
Торгово/промышленная группа	Comm.-Indust. Group	Comm.-Indust. Group
Торгово/промышленная и ремесленный классы и домовладелъцы	Bloc of Traders, Industrialists, Artisans, Homeowners	Comm.-Indust. list
Трети участок Телицкой волости Бендерского уезда	Citiz. of the Third Precinct of Telitskaya v., Bender u.	Citiz. of the Third Precinct of Telitskaya v., Bender u.
Трудовая народно/сосиалистийеская партия	Popular Socialists	Popular Socialists
Трудовая народно/сосиалистийеская партия	Popular Socialists	Popular Socialists
Трудовая народно/сосиалистийеская партия совместно с националъным Союзм черемисов Вятской губернии	Popular Socialists	Popular Socialists

Continuation of table B.3.2

Party (Russian)	Party (English)	Group assignment
Трудовая народно/сосиалистийеская партия, Баргузинского уезда	Popular Socialists of Bargusinskiy uezd	Popular Socialists of Bargusinskiy uezd
Трудовая народно/сосиалистийеская партия, Всероссийский крестъянский союз	Popular Socialists	Popular Socialists
Трудовая народно/сосиалистийеская партия, Забайкалъцкий отдел	Popular Socialists of Zabaikalskiy otdel	Popular Socialists of Zabaikalskiy otdel
Трудовая народно/сосиалистийеская партия, Общегубернский сьезд всех объединенных коопертивных организаций Тамбовской губернии	Popular Socialists	Popular Socialists
Трудовая народно/сосиалистийеская партия, Трудовое крестъяне	Popular Socialists	Popular Socialists
Трудовая народно/сосиалистийеская партия, деятели украинской кооперации	Popular Socialists	Popular Socialists
Трудовое крестъянство	Labor Peasantry	Other
Трудовой список	Labor list	Other
Украинская партия социалистов/революционеров	Ukrainian SRs	Ukrainian SRs
Украинская партия социалистов/революционеров совместно с Волынской радой селянских депутатов	Ukrainian SRs	Ukrainian SRs
Украинская партия социалистов/революционеров, Украинская селянская спилка	Ukrainian SRs, Selianska Spilka	Ukrainian SRs, Selianska Spilka
Украинская партия социалистов/революционеров, Украинская социал/демократичесткая рабочая партия, Объединенные еврейская социалистическая рабочая партия	Ukrainian SRs, SRs, the United Jewish Socialist Labour Party (S.S., E.S.)	Ukrainian SRs
Украинская партия социалистов/федералистов	Ukrainian Socialist-Federalists	Popular Socialists, Ukrainian Socialist-Federalists
Украинская партия социалистов/федералистов, Партия социалистов/революционеров	Ukrainian Socialist-Federalists, Ukrainian SRs	Popular Socialists, Ukrainian Socialist-Federalists
Украинская партия социалистов/федералистов, Селяне/хлеборобы	Ukrainian Socialist-Federalists	Popular Socialists, Ukrainian Socialist-Federalists
Украинская рада	Ukrainian SRs	Ukrainian SRs
Украинская социал/демократическая рабочая партия	Ukrainian SRs	Ukrainian SRs
Украинские социалистические организациий Бессарабской гурбернии	Ukrainian Socialist Organizations	Ukrainian SRs
Украинцы	Ukrainians	Other Ukrainians

Party (Russian)	Party (English)	Group assignment
Украинцы, левые	Leftist SRs	Ukrainian SRs
Украинцы, правые	Ukrainian Right	Rightist
Украиская социал/демократическая рабочая партия	Ukrainian SRs	Ukrainian SRs
Уралъский областной киргизский комитет	Ural Regional Kirghiz Committee	Alash Orda
Финны/социалисты	Finnish Socialists	Finnish SRs
Централъный комитет Черноморского флота, Севастополъский отдел Всероссийского союза моряков и речников	Tsentroflot, the Sevastopol Branch of the Union of Sailors	Chuvash
Централъный комитет объедиенного духовенства и мирян	Clergy, Laymen	Clergy, Laymen
Централъный комитет объедиенного духовенства и мирян, город Петропавловск	Clergy, Laymen of Petropavlovsk	Clergy, Laymen of Petropavlovsk
Четвертый участок Телицкой волости Бендерского уезда	Citiz. of the Fourth section of Telitskaya v., Bender u.	Citiz. of the Fourth section of Telitskaya v., Bender u.
Чеченский и ингушский народы Грозненского, Беденского и Назрановского округоб	Chechen-Ingush Peoples	Other
Чувашский военный комитет	The All Chuvash Nat. Congr.	Chuvash
Эстонская радикалъно/демократическая партия, Крестъянский союз	Estonian Radical Democratic Party	Rightist
Эстонская социал/демократическая рабочая партия	Estonian SDs	Estonian SDs
Эстонская трудовая партия	Estonian Labour Party	Estonian SRs
Эстонский демократической партии, Эстонского земелъного союза	Estonian Democratic Party, Estonian landowner union	Estonian Popular Socialists
Эстонский список	Estonian SDs	Estonian SDs
Якутский трудовой союз федералистов	Yakutia federalist labor union	Other

Table B.3.3.: Occupational specialization of Jews – disaggregated descriptive statistics

Rank	Occupation	Category	Perc. in category		Perc. Jews	Over-rep. Jews
			Jews	Non-Jews		
1	Trade: Grain	Commerce	3.32	0.05	0.899	62.489
2	Clergymen, non-Christian	Prof. Services	0.39	0.01	0.851	39.889
3	Trade: Furs, Leather, etc.	Commerce	0.83	0.03	0.820	32.025
4	Trade: Structural Material and Fuel	Commerce	1.84	0.06	0.809	29.713
5	Trade: Textile and Clothing	Commerce	2.78	0.10	0.797	27.590
6	Commercial Middlemen	Commerce	1.06	0.04	0.775	24.154
7	Trade: Metal Goods, Machinery, Arms	Commerce	0.45	0.02	0.773	23.802
8	General Commerce	Commerce	6.36	0.27	0.772	23.716
9	Peddlers and Hucksters	Commerce	1.27	0.06	0.762	22.440
10	Trade: Cattle	Commerce	1.09	0.05	0.750	20.998
11	Trade: other Agricultural Products	Commerce	9.74	0.49	0.739	19.809
12	Tobacco, and Tobacco Manufactures	Manufacturing	0.53	0.03	0.733	19.205

The table is obtained from Spitzer (Table 6.2 2015, p. 200) and reports statistics over the entire population of (language defined) Jews and non-Jews within the Pale, including Courland province. It lists the 12 most typically-Jewish occupations out of a total list of 65. Columns 1 and 2 report percentages of occupation indicators within each ethnic group. The percentages are from among the labor force, not the total population. Column 3 reports the share of Jews within each category. Column 4 reports the over-representation of Jews within each category. The ranking is according to the order in columns 3 and 4. Source: 1897 Russian Census, provincial volumes, Tables XXI and XXII. The categorization to occupation groups and the translated English titles are from Rubinow (1907, pp. 498).

Table B.3.4.: Geographic distribution of individuals under surveillance

	Frequency	Percentage	Cum. Percentage
Armenia	6	0.34	0.34
Azerbaijan	10	0.57	0.91
Belarus	93	5.30	6.21
Georgia	32	1.82	8.03
Kazakhstan	2	0.11	8.15
Latvia	39	2.22	10.37
Lithuania	71	4.05	14.42
Moldova	46	2.62	17.04
Poland	371	21.14	38.18
Russian Federation	711	40.51	78.69
Tajikistan	1	0.06	78.75
Turkey	2	0.11	78.86
Turkmenistan	1	0.06	78.92
Ukraine	370	21.08	100.00
Total	1,755	100.00	

Table B.3.5.: Getis-Ord G-statistic for revolutionary activity

Variable	Stat	Mean	Std. Dev.	z-Score	p-value*
Weights matrix: Investigated_GetisOrd					
Type: Distance-based (binary)					
Distance band: $0.0 < d \leq 16.3$ (medium distance)					
Row-standardized: No					
People investigated	0.853	0.691	0.100	1.629	0.052
Crime = propaganda	0.875	0.691	0.132	1.404	0.080
Crime = membership	0.902	0.691	0.161	1.317	0.094
Crime = riots	0.978	0.691	0.156	1.843	0.033
Crime = assassinations	0.938	0.691	0.147	1.682	0.046
Primary educated	0.833	0.691	0.119	1.196	0.116
Secondary educated	0.874	0.691	0.106	1.728	0.042
Tertiary educated	0.823	0.691	0.100	1.324	0.093
Unskilled	0.833	0.691	0.119	1.196	0.116
Blue-collar	0.874	0.691	0.106	1.728	0.042
White-collar	0.823	0.691	0.100	1.324	0.093
Male	0.857	0.691	0.105	1.579	0.057
Jewish origin	0.933	0.691	0.110	2.194	0.014
Age observed in surveillance record	.	0.691	0.025	.	.

Table B.3.6.: Missingness by estate holder as in the 1897 census

	Panel A: By estate				
	Invest.	Propag.	M.ship	Riots	Assass.
Clergy, all Christian faiths w. families 1897	0.003**	0.005	0.004*	−0.670	0.005*
Urban commoners 1897	0.000	0.000	−0.000	−0.015	−0.000
Cossack troops 1897	0.001	−0.009	0.001	−1.680	−0.001
Finnish natives regardless of estate 1897	−0.084	0.839	−0.241	−0.136	0.653
Foreign nationals 1897	−0.000	−0.001	−0.000	0.090	−0.000
Hereditary nobility w. families 1897	0.000	−0.000	0.000	−0.026	0.000
Hereditary, hon. citizens w. families 1897	−0.000	−0.002	−0.001	0.619	−0.002
Merchants and their families 1897	0.002	−0.002	0.002	−1.853	−0.002
Peasants 1897	−0.000*	−0.000**	−0.000	0.006	−0.000
Pers. nobility, non-nob. officials w. families 1897	−0.002	−0.001	−0.004*	0.955	−0.001
Not belonging to these estates 1897	0.001	−0.003	0.002	0.046	0.001
Not indicating estate 1897	0.001	0.012	0.007	−0.085	0.005
non-Russian 1897	0.080	1.324**	−0.053	−1.639	−0.030
Chi-squared	27.274	50.029	40.300	27.217	31.809
p-Value	0.011	0.000	0.000	0.012	0.003
Observations	234	234	234	234	234

Table B.3.7.: Missingness by religion as in the 1897 census

	Panel B: By religion				
	Invest.	Propag.	M.ship	Riots	Assass.
Anglican 1897	−0.053	0.259	−0.274	−1.831	0.160
Armenian Catholic 1897	−0.102	−0.598	−0.293	3.954	0.071
Armenian Gregorian 1897	0.008	0.047	0.025	−0.007	−0.006
Baptist 1897	0.000	0.006	0.002	1.619	0.006
Buddhist and Lamaist 1897	−0.089	−0.243	−0.281	6.478	−0.466**
1897	−0.000	−0.000	−0.000	0.003	−0.000
Jewish 1897	0.000	−0.000	0.000	−0.009	−0.000
Karaite 1897	−0.007	−0.075	−0.004	−3.551	−0.006
Lutheran 1897	−0.000	0.000	0.000	−0.014	−0.000
Mennonite 1897	0.000	−0.000	−0.000	−0.076	−0.001
Muslim 1897	0.001	0.007	0.001	0.099	−0.000
Orthodox and Common Faith 1897	−0.000	−0.000	−0.000	0.001	0.000
Old Believers, non-Orthodox 1897	0.000	0.001	−0.000	0.000	−0.000
Reformed 1897	0.001	−0.001	0.002	−0.152*	0.000
Chi-squared	25.909	50.511	41.702	28.788	34.743
p-Value	0.027	0.000	0.000	0.011	0.002
Observations	234	234	234	234	234

Table B.3.8.: Missingness by trade sector as in Grosfeld, Sakalli, et al. (2020)

	Panel C: By trader ethnicity				
	Invest.	Propag.	M.ship	Riots	Assass.
Sh. Armenian grain traders	−58.003	−843.510**	−149.927	−6.059	−43.184
Sh. Belorussian grain traders	−29.683	−11.467	−68.119	−19.502	−35.183
Sh. Bulgarian grain traders	−3170.761*	−1.72e + 04	−2604.706	−1515.623	−1693.317*
Sh. Czech grain traders	−1053.039	2138.869	3967.667	0.000	2225.926
Sh. Finn grain traders	0.000	0.000	0.000	0.000	0.000
Sh. German grain traders	−24.704	0.519	−64.429	38.366	−38.233
Sh. Greek grain traders	−42.936	2545.688*	−140.890	−50.025	0.442
Sh. Jew grain traders	−26.308	−5.319	−60.296	−4.493	−25.146
Sh. Latvian grain traders	336.990	0.000	235.733	0.000	218.203
Sh. Lithuanian grain traders	−19.599	−0.055	−54.338	−5.598	−21.858
Sh. Moldovan grain traders	2807.446*	13584.871	2299.102	1836.768	1458.941
Sh. Pole grain traders	−14.327	6.973	−47.297	37.006	−2.671
Sh. Russian grain traders	−21.169	54.068	−30.789	5.505	−21.056
Sh. Ukrainian grain traders	−30.031	2.310	−59.170	47.103	−30.303
Chi-squared	22.661	21.229	20.571	11.679	17.185
p-Value	0.046	0.047	0.082	0.388	0.191
Observations	215	208	215	194	215

Table B.3.9.: Missingness by credit sector as in Grosfeld, Sakalli, et al. (2020)

	Panel D: By creditor ethnicity				
	Invest.	Propag.	M.ship	Riots	Assass.
Sh. Armenian creditors	−101.635	−48.463	−74.490	−197.287[*]	−384.497[**]
Sh. Belorussian creditors	−1.113	−5.638	4.735	0.521	7.180
Sh. Bulgarian creditors	−25.167	−7.887	−16.742	40.174	20.930
Sh. Czech creditors	0.631	1372.978	0.677	1133.613	−0.596
Sh. Finn creditors	−619.995	−2457.546	−1077.914	0.000	−1043.871
Sh. German creditors	−8.083	5.673	−3.726	3.633	−2.205
Sh. Gypsie creditors	16.187	19.373	5.004	−16.483	24.348
Sh. Jew creditors	−0.738	−0.648	1.198	4.943	3.263
Sh. Latvian creditors	96.579	0.000	52.905	0.000	38.093
Sh. Lithuanian creditors	−3.123	−2.168	1.772	0.409	4.853
Sh. Moldovan creditors	159.679	72.963	136.794	120.100	279.579
Sh. other ethnicitie creditors	8.422	8.320	12.011	1.981	4.589
Sh. Pole creditors	−1.253	−1.162	1.077	4.347	3.060
Sh. Russian creditors	−2.989	−1.906	0.070	4.083	2.822
Sh. Turks/Tatar creditors	139.998	21.323	70.538	1140.684	2178.185
Sh. Ukrainian creditors	0.052	0.227	2.225	7.336	6.036
Chi-squared	12.415	6.032	6.860	5.670	16.188
p-Value	0.715	0.979	0.976	0.974	0.440
Observations	215	204	215	201	215

Table B.3.10.: Descriptive statistics for dependent variables (imputed values)

Variable	Mean	SD	Minimum	Maximum	Observations
Panel A: Individual Parties					
Mensheviks	0.042	0.120	0.00	0.95	391
SRevol	0.568	0.250	0.00	0.97	391
Bolsheviks	0.234	0.214	0.00	0.78	391
Jewish lists	0.016	0.042	0.00	0.38	391
Liberals	0.008	0.014	0.00	0.10	391
Kadets	0.047	0.045	0.00	0.29	391
Panel B: Relative Radicalization					
PolIndex	0.455	0.171	0.08	1.12	449
Far Left	0.249	0.226	0.00	0.89	391
Moderate Left	0.019	0.088	0.00	0.74	391
Center	0.608	0.243	0.00	0.99	391
Moderate Right	0.068	0.136	0.00	0.90	391
Far Right	0.055	0.046	0.00	0.29	391
Panel C: General Radicalization					
Most left	−1.918	0.799	−4.36	0.00	391
Most right	0.381	0.355	0.00	2.24	391
Left-right range	2.299	0.792	0.74	5.22	391
COG	−1.829	1.285	−4.18	2.05	449
Panel D: Median Party					
Mensheviks	0.051	0.221	0.00	1.00	449
SRevol.	0.167	0.373	0.00	1.00	449
Bolsheviks	0.007	0.082	0.00	1.00	449
Jewish lists	0.131	0.338	0.00	1.00	449
Liberals	0.089	0.285	0.00	1.00	449
Kadets	0.002	0.047	0.00	1.00	449

The descriptive statistics refer to the imputed dataset. The matrix is calculated with the user-written command `misum` by Daniel Klein. The descriptive variables refer to various vote shares for different political factions, such as the Mensheviks, SRevol, Bolsheviks, Jewish lists, Liberals, and Kadets. The electoral polarization index measures the level of polarization in elections. To assess radicalization, several variables are categorized into five political party groups based on cumulative vote shares. The far-left group comprises the Social Revolutionaries and Bolsheviks, while the far-right group includes the Commercial industrialists, landowners (referred to as Liberals), and Kadets. The district-level political spectrum calculates the absolute distance between the weighted positions of the most leftist and most rightist parties at the election, based on their vote share. The Median Party status, which is a dummy variable indicating whether a party is a median party or not, based on its rank and vote share. A median party is defined as a party whose vote share is in the middle of the distribution. This variable is important because it helps identify parties that are more likely to hold a pivotal position in the political process.

Table B.3.11.: Descriptive statistics for explanatory variables (imputed values)

Variable	Mean	SD	Minimum	Maximum	Observations
Panel A: Tsarist repression (explanatory variables)					
Okhrana	4.33	23.55	0.00	360.89	384
Male revolutionaries	3.34	18.90	0.00	290.82	384
Propaganda	0.48	3.10	0.00	47.99	384
Membership	0.78	5.99	0.00	95.98	384
Riots	0.11	0.80	0.00	12.48	384
Assassinations	0.94	7.37	0.00	118.06	384
Panel B: Geographic control variables					
Latitude	54.02	3.85	44.60	69.58	449
Longitude	37.94	7.97	24.30	63.29	449
Coal Territory 0/1	0.41	0.49	0.00	1.00	449
Podzol Soil	0.36	0.37	0.00	1.00	449
Distance to Coast	6.30	3.41	0.08	17.08	449
Length Growing Period	156.95	32.86	69.86	213.32	449
Distance Provincial Capital	1.25	0.98	0.00	8.65	449
Distance to St. Petersburg	9.43	3.84	0.32	20.02	449
Panel C: Demographic control variables					
Number of secondary educated 1897	2031.27	4390.84	306.00	80018.00	438
Number of teriary educated 1897	179.92	671.36	13.00	12447.00	438
Sh. Eastern Slavic language speakers 1897	0.85	0.20	0.05	1.00	438
Sh. Yiddish language speakers 1897	0.03	0.05	0.00	0.16	438
Share industrial workers 1897	0.07	0.05	0.02	0.27	438
Share agricultural workers 1897	0.69	0.13	0.19	0.84	438
Serfs % (1858)	0.40	0.25	0.00	0.85	449
Change in gender ratio 1913-17	−0.08	0.68	−9.31	0.90	379
Panel D: Middlemen control variables					
Sh. Jews among craftsmen	0.43	0.21	0.04	0.80	110
Sh. Jews among creditors	0.56	0.26	0.05	1.00	110
Sh. Jews among traders	0.78	0.21	0.08	0.97	110
Sh. Jews among transporters	0.34	0.20	0.00	0.91	110
Sh. Jews among nonagricultural traders	0.80	0.21	0.11	0.99	110
Sh. Jews among general traders	0.78	0.22	0.07	0.99	110
Sh. Jews among grain traders	0.88	0.18	0.18	1.00	110
Sh. other ethnicities among creditors	0.00	0.02	0.00	0.23	110
Sh. other ethnicities among grain traders	0.00	0.01	0.00	0.05	110

The descriptive statistics refer to the imputed dataset. The matrix is calculated with the user-written command `misum` by Daniel Klein. The demographic controls came from two sources: Buggle and Nafziger (2021) and G. Kessler and Markevich (2017) and include district location factors, such as latitude, longitude, distance to the coastline, and global distance to the provincial capital and St. Petersburg. Other factors are the length of the growing season, presence of coal territories, and type of soil. Additionally, we account for the proportion of individuals with secondary and tertiary education, the proportion of Slavs and Jews by language, and the proportion of workers in industrial and agricultural sectors. These factors are measured based on the 1897 population levels and weighted by district population levels. We further include the share of serfs in 1858 as a control for each district. Moreover, middlemen controls from Grosfeld, Sakalli, et al. (2020) reflect the Jewish minority's integration into the countryside, including the proportion of Jews among craftsmen, creditors, transport, and grain trade. These controls were obtained by collapsing a grid-level dataset.

Table B.3.12.: Correlation results with relative radicalization in European Russia (Part A)

	PolIndex	Far Left	Moderate Left	Center	Moderate Right	Far Right
	Panel A: Tsarist repression (explanatory variables)					
Okhrana	−0.001*	0.001	−0.000	−0.002**	0.000	0.001***
Male revolutionaries	−0.001*	0.002	−0.000	−0.002**	0.000	0.001***
Propaganda	−0.004	0.010*	−0.001	−0.015**	0.001	0.005***
Membership	−0.002*	0.007**	−0.000	−0.008**	−0.001	0.003***
Riots	−0.016	0.051**	−0.006	−0.065***	−0.000	0.020***
Assassinations	−0.002*	0.005**	−0.000	−0.006**	−0.001	0.002***
	Panel B: Geographic control variables					
Latitude	0.004*	0.027***	−0.005***	−0.016***	−0.009***	0.004***
Longitude	0.010***	−0.001	−0.001**	−0.002	0.004***	0.000
Coal Territory 0/1	0.031*	−0.046**	0.013	0.027	0.026*	−0.020***
Podzol Soil	−0.102***	0.285***	−0.040***	−0.201***	−0.076***	0.032***
Distance to Coast	0.004*	0.004	−0.005***	−0.007*	0.008***	−0.001
Length Growing Period	−0.002***	0.002***	−0.000***	−0.001**	−0.001***	0.000*
Distance Provincial Capital	0.083***	−0.028**	−0.003	0.023*	0.020***	−0.012***
Distance to St. Petersburg	0.019***	−0.032***	0.004***	0.015***	0.017***	−0.003***

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. The correlations refer to the imputed dataset with 20 imputations. The matrix is calculated with an imputed regression of the dependent variables on each explanatory variable invidually. The dependent variables were categorized into five political party groups using the Arzamas method and the researchers' own coding. The groups were based on cumulative vote shares and included far-left (right), moderate left (right), center, moderate right, and far-right. The far-left comprised Social Revolutionaries and Bolsheviks, moderate-left included Peasant and Cooperative parties, the center included Mensheviks, Social Revolutionaries, and other socialists, moderate-right included Orthodox, Muslim, Jewish, and minority parties, and the far-right included Commercial industrialists, landowners (referred to as Liberals), and the Kadets. The explanatory variables include Tsarist repression, geographic and demographic controls from G. Kessler and Markevich (2017) and Buggle and Nafziger (2021) as well as the middlemen controls obtained from Grosfeld, Sakalli, et al. (2020).

Table B.3.13.: Correlation results with relative radicalization in European Russia (Part B)

	PolIndex	Far Left	Moderate Left	Center	Moderate Right	Far Right
Panel C: Demographic control variables						
Number of secondary educated 1897	−0.000*	0.000	0.000	−0.000	0.000	0.000*
Number of teriary educated 1897	−0.000**	0.000	0.000	−0.000	0.000	0.000
Sh. Eastern Slavic language speakers 1897	0.110***	0.448***	−0.112***	−0.022	−0.347***	0.033**
Sh. Yiddish language speakers 1897	−0.534***	−2.164***	0.281***	1.498***	0.576***	−0.190***
Share industrial workers 1897	−0.900***	1.900***	0.033	−1.640***	−0.412***	0.119***
Share agricultural workers 1897	0.398***	−0.556***	−0.016	0.522***	0.097**	−0.046***
Serfs % (1858)	−0.237***	0.240***	−0.044**	0.002	−0.177***	−0.022**
Change in gender ratio 1913-17	−0.020	0.008	0.003	−0.020	0.006	0.003
Panel D: Middlemen control variables						
Sh. Jews among craftsmen	−0.046	−0.091	−0.120	0.149	0.093*	−0.030
Sh. Jews among creditors	−0.048	−0.038	−0.085	0.171*	−0.004	−0.044**
Sh. Jews among traders	−0.074	−0.056	−0.235***	0.404***	−0.053	−0.060***
Sh. Jews among transporters	−0.083	−0.126	−0.217**	0.376***	0.006	−0.039
Sh. Jews among nonagricultural traders	−0.082	−0.032	−0.213**	0.380***	−0.073	−0.062***
Sh. Jews among general traders	−0.097*	−0.013	−0.287***	0.422***	−0.063	−0.059***
Sh. Jews among grain traders	0.131*	−0.087	−0.137	0.362**	−0.102	−0.035
Sh. other ethnicities among creditors	0.732	−0.154	−0.226	0.429	−0.068	0.018
Sh. other ethnicities among grain traders	−0.922	−1.222	1.388	−4.131	2.792	1.173*

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. The correlations refer to the imputed dataset with 20 imputations. The matrix is calculated with an imputed regression of the dependent variables on each explanatory variable invidually. The dependent variables were categorized into five political party groups using the Arzamas method and the researchers' own coding. The groups were based on cumulative vote shares and included far-left (right), moderate left (right), center, moderate right, and far-right. The far-left comprised Social Revolutionaries and Bolsheviks, moderate-left included Peasant and Cooperative parties, the center included Mensheviks, Social Revolutionaries, and other socialists, moderate-right included Orthodox, Muslim, Jewish, and minority parties, and the far-right included Commercial industrialists, landowners (referred to as Liberals), and the Kadets. The explanatory variables include Tsarist repression, geographic and demographic controls from G. Kessler and Markevich (2017) and Buggle and Nafziger (2021) as well as the middlemen controls obtained from Grosfeld, Sakalli, et al. (2020).

Table B.3.14.: Radicalization in European Russia

	Most left		Most right		Left-right range	
	(1)	(2)	(3)	(4)	(5)	(6)
Okhrana	−0.073	−0.165*	−0.043	−0.065	0.030	0.100
	(0.099)	(0.093)	(0.042)	(0.042)	(0.097)	(0.095)
Male revolutionaries	0.060	0.206	0.117*	0.146**	0.058	−0.060
	(0.147)	(0.139)	(0.063)	(0.063)	(0.145)	(0.142)
Propaganda	0.183	0.018	0.669***	0.474***	0.486	0.456
	(0.363)	(0.355)	(0.155)	(0.162)	(0.357)	(0.364)
Membership	0.798**	0.745**	−0.808***	−0.591***	−1.605***	−1.336***
	(0.384)	(0.375)	(0.164)	(0.171)	(0.377)	(0.385)
Riots	−3.180***	−1.182	1.403***	1.521***	4.583***	2.703***
	(0.915)	(0.939)	(0.390)	(0.428)	(0.900)	(0.963)
Assassinations	−0.316	−0.492**	0.090	−0.023	0.406*	0.469**
	(0.236)	(0.222)	(0.100)	(0.101)	(0.232)	(0.227)
Constituency FE	−0.005	−0.006*	−0.002	−0.002	0.003	0.005
	(0.004)	(0.004)	(0.002)	(0.002)	(0.004)	(0.004)
Demographics	✓	✓	✓	✓	✓	✓
Geographics	—	✓	—	✓	—	✓
F-Statistics	9.327	11.124	8.901	7.815	11.114	10.538
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000
Imputations	20	20	20	20	20	20
Observations	313	313	313	313	313	313

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The dependent variables refer to the left-right position of the most leftist and most rightist parties at the 1917 Constituency Assembly election. In addition, the district-level political spectrum is measured by calculating the absolute distance between the weighted position of the most leftist and most rightist parties at the election, based on their vote share and also utilized in the Manifesto project. The demographic controls came from two sources: Buggle and Nafziger (2021) and G. Kessler and Markevich (2017) and include district location factors, such as latitude, longitude, distance to the coastline, and global distance to the provincial capital and St. Petersburg. Other factors are the length of the growing season, presence of coal territories, and type of soil. Additionally, we account for the proportion of individuals with secondary and tertiary education, the proportion of Slavs and Jews by language, and the proportion of workers in industrial and agricultural sectors. These factors are measured based on the 1897 population levels and weighted by district population levels. We further include the share of serfs in 1858 as a control for each district.

Radicalization in the Pale

	Most left		Most right		Left-right range	
	(1)	(2)	(3)	(4)	(5)	(6)
Okhrana	−0.534	−0.727	−0.100	−0.042	0.434	0.686*
	(0.348)	(0.444)	(0.144)	(0.179)	(0.319)	(0.396)
Male revolutionaries	0.634	0.968	0.129	0.138	−0.504	−0.830
	(0.507)	(0.604)	(0.210)	(0.243)	(0.466)	(0.539)
Propaganda	−1.085	−1.963	0.118	0.750	1.203	2.713**
	(1.045)	(1.256)	(0.433)	(0.505)	(0.959)	(1.120)
Membership	0.015	−0.261	−0.232	−0.512	−0.247	−0.251
	(0.762)	(0.790)	(0.315)	(0.318)	(0.699)	(0.705)
Riots	6.795*	9.763*	3.075**	0.785	−3.720	−8.978**
	(3.599)	(4.866)	(1.490)	(1.958)	(3.303)	(4.341)
Assassinations	0.631	0.463	0.192	−0.182	−0.439	−0.646
	(0.590)	(0.683)	(0.245)	(0.275)	(0.542)	(0.609)
Constituency FE	0.053***	0.070***	0.010	0.018**	−0.043**	−0.052**
	(0.019)	(0.022)	(0.008)	(0.009)	(0.017)	(0.019)
Demographics	✓	✓	✓	✓	✓	✓
Geographics	✓	✓	✓	✓	✓	✓
Middlemen	—	✓	—	✓	—	✓
F-Statistics	7.623	6.622	3.542	3.676	7.188	6.703
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000
Imputations	20	20	20	20	20	20
Observations	74	67	74	67	74	67

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The dependent variables refer to the left-right position of the most leftist and most rightist parties at the 1917 Constituency Assembly election. In addition, the district-level political spectrum is measured by calculating the absolute distance between the weighted position of the most leftist and most rightist parties at the election, based on their vote share and also utilized in the Manifesto project. The demographic controls came from two sources: Buggle and Nafziger (2021) and G. Kessler and Markevich (2017) and include district location factors, such as latitude, longitude, distance to the coastline, and global distance to the provincial capital and St. Petersburg. Other factors are the length of the growing season, presence of coal territories, and type of soil. Additionally, we account for the proportion of individuals with secondary and tertiary education, the proportion of Slavs and Jews by language, and the proportion of workers in industrial and agricultural sectors. These factors are measured based on the 1897 population levels and weighted by district population levels. We further include the share of serfs in 1858 as a control for each district. Moreover, middlemen controls from Grosfeld, Sakalli, et al. (2020) reflect the Jewish minority's integration into the countryside, including the proportion of Jews among craftsmen, creditors, transport, and grain trade. These controls were obtained by collapsing a grid-level dataset.

Table B.3.16.: Median party status in European Russia, by individual party

	Vote share					
	(1) Mensheviks	(2) SRevol.	(3) Bolsheviks	(4) Jewish lists	(5) Liberals	(6) Kadets
Okhrana	−0.050	0.058	0.000	0.039	−0.057	0.000
	(0.031)	(0.037)	(.)	(0.042)	(0.035)	(0.008)
Male revolutionaries	0.091*	−0.124**	0.000	−0.097	0.086	−0.001
	(0.047)	(0.056)	(.)	(0.063)	(0.053)	(0.012)
Propaganda	−0.173	−0.058	0.000	0.643***	−0.308**	0.002
	(0.120)	(0.143)	(.)	(0.161)	(0.136)	(0.031)
Membership	−0.175	0.221	0.000	−0.535***	0.081	−0.029
	(0.123)	(0.146)	(.)	(0.165)	(0.140)	(0.032)
Riots	0.617*	−0.525	0.000	−1.191***	0.373	0.060
	(0.316)	(0.377)	(.)	(0.426)	(0.360)	(0.083)
Assassinations	0.076	0.028	0.000	0.419***	−0.007	0.019
	(0.074)	(0.088)	(.)	(0.099)	(0.084)	(0.019)
Constituency FE	−0.000	0.002	0.000	0.003	−0.005***	−0.000
	(0.001)	(0.001)	(.)	(0.002)	(0.001)	(0.000)
Demographics	✓	✓	✓	✓	✓	✓
Geographics	✓	✓	✓	✓	✓	✓
F-Statistics	2.356	5.301	.	10.150	8.330	0.772
Prob > F	0.001	0.000	.	0.000	0.000	0.766
Imputations	20	20	20	20	20	20
Observations	330	330	330	330	330	330

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The Median Party status is dummy variable, coded as 1 if a party is a median party and 0 if not. The median party is calculated by ranking the party's votes and calculating the row median. A party is coded as a median party if its rank corresponds to the row median. Different parties with the same left-right position (e.g. alliances) are treated as one party with the cumulative vote share. The dependent variables refer to different political factions. Mensheviks encompasses the vote share for the center, leftist, and rightist factions of the Menshevik party. SRevol represents the vote share for the Social Revolutionaries, while Bolsheviks refers to any list where the Bolsheviks were the leading party. Jewish lists refers to the vote share for Jewish lists, such as Fareynikte, the Bund, or the Zionists. Liberals denotes the vote share for the Commercial Industrialists and Landowners, and Kadets represents the vote share for the most rightist party electable in the 1917 assembly. The demographic controls came from two sources: Buggle and Nafziger (2021) and G. Kessler and Markevich (2017) and include district location factors, such as latitude, longitude, distance to the coastline, and global distance to the provincial capital and St. Petersburg. Other factors are the length of the growing season, presence of coal territories, and type of soil. Additionally, we account for the proportion of individuals with secondary and tertiary education, the proportion of Slavs and Jews by language, and the proportion of workers in industrial and agricultural sectors. These factors are measured based on the 1897 population levels and weighted by district population levels. We further include the share of serfs in 1858 as a control for each district.

	Vote share					
	(1) Mensheviks	(2) SRevol.	(3) Bolsheviks	(4) Jewish lists	(5) Liberals	(6) Kadets
Okhrana	−0.165	0.093	0.000	0.000	0.121	0.055
	(0.145)	(0.222)	(.)	(.)	(0.127)	(0.097)
Male revolutionaries	0.256	−0.228	0.000	0.000	−0.078	−0.118
	(0.213)	(0.326)	(.)	(.)	(0.187)	(0.142)
Propaganda	−0.262	0.551	0.000	0.000	−0.132	0.273
	(0.432)	(0.661)	(.)	(.)	(0.379)	(0.289)
Membership	−0.357	−0.055	0.000	0.000	−0.120	0.087
	(0.306)	(0.469)	(.)	(.)	(0.269)	(0.205)
Riots	1.272	−4.615**	0.000	0.000	−0.361	−0.757
	(1.421)	(2.176)	(.)	(.)	(1.248)	(0.950)
Assassinations	0.246	0.421	0.000	0.000	−0.266	0.065
	(0.240)	(0.367)	(.)	(.)	(0.211)	(0.160)
Constituency FE	−0.009	−0.005	0.000	0.000	0.005	−0.002
	(0.007)	(0.011)	(.)	(.)	(0.006)	(0.005)
Demographics	✓	✓	✓	✓	✓	✓
Geographics	✓	✓	✓	✓	✓	✓
F-Statistics	4.170	4.929	.	.	10.813	0.631
Prob > F	0.000	0.000	.	.	0.000	0.887
Imputations	20	20	20	20	20	20
Observations	82	82	82	82	82	82

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The Median Party status is dummy variable, coded as 1 if a party is a median party and 0 if not. The median party is calculated by ranking the party's votes and calculating the row median. A party is coded as a median party if its rank corresponds to the row median. Different parties with the same left-right position (e.g. alliances) are treated as one party with the cumulative vote share. The dependent variables refer to different political factions. Mensheviks encompasses the vote share for the center, leftist, and rightist factions of the Menshevik party. SRevol represents the vote share for the Social Revolutionaries, while Bolsheviks refers to any list where the Bolsheviks were the leading party. Jewish lists refers to the vote share for Jewish lists, such as Fareynikte, the Bund, or the Zionists. Liberals denotes the vote share for the Commercial Industrialists and Landowners, and Kadets represents the vote share for the most rightist party electable in the 1917 assembly. The demographic controls came from two sources: Buggle and Nafziger (2021) and G. Kessler and Markevich (2017) and include district location factors, such as latitude, longitude, distance to the coastline, and global distance to the provincial capital and St. Petersburg. Other factors are the length of the growing season, presence of coal territories, and type of soil. Additionally, we account for the proportion of individuals with secondary and tertiary education, the proportion of Slavs and Jews by language, and the proportion of workers in industrial and agricultural sectors. These factors are measured based on the 1897 population levels and weighted by district population levels. We further include the share of serfs in 1858 as a control for each district. Moreover, middlemen controls from Grosfeld, Sakalli, et al. (2020) reflect the Jewish minority's integration into the countryside, including the proportion of Jews among craftsmen, creditors, transport, and grain trade. These controls were obtained by collapsing a grid-level dataset.

Table B.3.18.: Benefactors of Okhrana repression in European Russia, by individual parties

	Radicalization of the political spectrum in the Pale					
	(1) Mensheviks	(2) SRevol	(3) Bolsheviks	(4) Jewish lists	(5) Liberals	(6) Kadets
Okhrana	0.047	−0.002	−0.035	−0.030	−0.016	0.009
	(0.064)	(0.156)	(0.091)	(0.048)	(0.014)	(0.021)
Male revolutionaries	−0.068	−0.040	0.110	0.063	0.019	0.005
	(0.087)	(0.212)	(0.124)	(0.065)	(0.019)	(0.029)
Propaganda	−0.345*	−0.647	0.037	0.290**	0.023	0.139**
	(0.181)	(0.440)	(0.257)	(0.136)	(0.040)	(0.060)
Membership	0.836***	0.121	−0.302*	−0.297***	−0.017	−0.182***
	(0.114)	(0.277)	(0.162)	(0.085)	(0.025)	(0.038)
Riots	0.227	0.416	0.234	−0.496	0.067	0.144
	(0.703)	(1.707)	(0.996)	(0.527)	(0.155)	(0.232)
Assassinations	−0.418***	0.208	−0.042	0.028	0.004	0.015
	(0.099)	(0.240)	(0.140)	(0.074)	(0.022)	(0.033)
Constituency FE	0.012***	−0.019**	0.007	0.006**	0.000	0.002*
	(0.003)	(0.008)	(0.004)	(0.002)	(0.001)	(0.001)
Demographics	✓	✓	✓	✓	✓	✓
Geographics	✓	✓	✓	✓	✓	✓
Middlemen	✓	✓	✓	✓	✓	✓
F-Statistics	27.708	9.021	6.238	3.785	5.974	4.880
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000
Imputations	20	20	20	20	20	20
Observations	67	67	67	67	67	67

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The dependent variables refer to different political factions. Mensheviks encompasses the vote share for the center, leftist, and rightist factions of the Menshevik party. SRevol represents the vote share for the Social Revolutionaries, while Bolsheviks refers to any list where the Bolsheviks were the leading party. Jewish lists refers to the vote share for Jewish lists, such as Fareynikte, the Bund, or the Zionists. Liberals denotes the vote share for the Commercial Industrialists and Landowners, and Kadets represents the vote share for the most rightist party electable in the 1917 assembly. The demographic controls came from two sources: Buggle and Nafziger (2021) and G. Kessler and Markevich (2017) and include district location factors, such as latitude, longitude, distance to the coastline, and global distance to the provincial capital and St. Petersburg. Other factors are the length of the growing season, presence of coal territories, and type of soil. Additionally, we account for the proportion of individuals with secondary and tertiary education, the proportion of Slavs and Jews by language, and the proportion of workers in industrial and agricultural sectors. These factors are measured based on the 1897 population levels and weighted by district population levels. We further include the share of serfs in 1858 as a control for each district. Moreover, middlemen controls from Grosfeld, Sakalli, et al. (2020) reflect the Jewish minority's integration into the countryside, including the proportion of Jews among craftsmen, creditors, transport, and grain trade. These controls were obtained by collapsing a grid-level dataset.

Table B.3.19.: Benefactors of Okhrana repression in European Russia, by faction

	Radicalization of the political spectrum in the Pale				
	(1) Far Left	(2) Moderate Left	(3) Center	(4) Moderate Right	(5) Far Right
Okhrana	−0.035	0.016	0.041	−0.016	−0.006
	(0.091)	(0.042)	(0.119)	(0.057)	(0.026)
Male revolutionaries	0.110	−0.078	−0.101	0.045	0.024
	(0.124)	(0.057)	(0.162)	(0.077)	(0.035)
Propaganda	0.037	0.343***	−0.941***	0.398**	0.163**
	(0.257)	(0.120)	(0.336)	(0.161)	(0.073)
Membership	−0.302*	0.041	0.898***	−0.437***	−0.199***
	(0.162)	(0.075)	(0.212)	(0.101)	(0.046)
Riots	0.234	−0.569	0.682	−0.558	0.211
	(0.996)	(0.463)	(1.303)	(0.623)	(0.284)
Assassinations	−0.042	0.104	−0.193	0.112	0.019
	(0.140)	(0.065)	(0.183)	(0.087)	(0.040)
Constituency FE	0.007	−0.008***	−0.006	0.005*	0.002
	(0.004)	(0.002)	(0.006)	(0.003)	(0.001)
Demographics	✓	✓	✓	✓	✓
Geographics	✓	✓	✓	✓	✓
Middlemen	✓	✓	✓	✓	✓
F-Statistics	6.238	45.022	10.385	3.772	5.073
Prob > F	0.000	0.000	0.000	0.000	0.000
Imputations	20	20	20	20	20
Observations	67	67	67	67	67

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The dependent variables were categorized into five political party groups using the Arzamas method and the researchers' own coding. The groups were based on cumulative vote shares and included far-left (right), moderate left (right), center, moderate right, and far-right. The far-left comprised Social Revolutionaries and Bolsheviks, moderate-left included Peasant and Cooperative parties, the center included Mensheviks, Social Revolutionaries, and other socialists, moderate-right included Orthodox, Muslim, Jewish, and minority parties, and the far-right included Commercial industrialists, landowners (referred to as Liberals), and the Kadets. The demographic controls came from two sources: Buggle and Nafziger (2021) and G. Kessler and Markevich (2017) and include district location factors, such as latitude, longitude, distance to the coastline, and global distance to the provincial capital and St. Petersburg. Other factors are the length of the growing season, presence of coal territories, and type of soil. Additionally, we account for the proportion of individuals with secondary and tertiary education, the proportion of Slavs and Jews by language, and the proportion of workers in industrial and agricultural sectors. These factors are measured based on the 1897 population levels and weighted by district population levels. We further include the share of serfs in 1858 as a control for each district. Moreover, middlemen controls from Grosfeld, Sakalli, et al. (2020) reflect the Jewish minority's integration into the countryside, including the proportion of Jews among craftsmen, creditors, transport, and grain trade. These controls were obtained by collapsing a grid-level dataset.

Table B.3.20.: Spatial Correction with Arbitrary Clustering: Individual Parties (Part A)

	Mensheviks		SRevol		Bolsheviks		Jewish lists	
	(1) 60km	(2) 100km	(3) 60km	(4) 100km	(5) 60km	(6) 100km	(7) 60km	(8) 100km
Okhrana	0.025	0.025	−0.007	−0.007	0.021	0.021	−0.007**	−0.007**
	(0.017)	(0.018)	(0.024)	(0.024)	(0.023)	(0.023)	(0.003)	(0.003)
Male revolutionaries	−0.033	−0.033	−0.020	−0.020	−0.024	−0.024	0.014***	0.014***
	(0.027)	(0.028)	(0.034)	(0.035)	(0.033)	(0.033)	(0.004)	(0.004)
Propaganda	0.024	0.024	−0.113	−0.113	0.012	0.012	0.019	0.019
	(0.050)	(0.056)	(0.107)	(0.108)	(0.080)	(0.082)	(0.030)	(0.029)
Membership	0.077	0.077	0.245*	0.245*	−0.003	−0.003	−0.020	−0.020
	(0.079)	(0.082)	(0.132)	(0.131)	(0.077)	(0.078)	(0.044)	(0.044)
Riots	−0.405**	−0.405**	−0.158	−0.158	−0.283	−0.283	0.036	0.036
	(0.167)	(0.186)	(0.261)	(0.264)	(0.193)	(0.201)	(0.075)	(0.074)
Assassinations	−0.023	−0.023	−0.074	−0.074	0.027	0.027	−0.008	−0.008
	(0.060)	(0.060)	(0.075)	(0.075)	(0.043)	(0.043)	(0.015)	(0.015)
Constituency FE	−0.001*	−0.001	−0.000	−0.000	0.004***	0.004***	0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)
Demographics	✓	✓	✓	✓	✓	✓	✓	✓
Geographics	✓	✓	✓	✓	✓	✓	✓	✓
Observations	6260	6260	6260	6260	6260	6260	6260	6260

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The dependent variables refer to different political factions. Mensheviks encompasses the vote share for the center, leftist, and rightist factions of the Menshevik party. SRevol represents the vote share for the Social Revolutionaries, while Bolsheviks refers to any list where the Bolsheviks were the leading party. Jewish lists refers to the vote share for Jewish lists, such as Fareynikte, the Bund, or the Zionists. Liberals denotes the vote share for the Commercial Industrialists and Landowners, and Kadets represents the vote share for the most rightist party electable in the 1917 assembly. The demographic controls came from two sources: Buggle and Nafziger (2021) and G. Kessler and Markevich (2017) and include district location factors, such as latitude, longitude, distance to the coastline, and global distance to the provincial capital and St. Petersburg. Other factors are the length of the growing season, presence of coal territories, and type of soil. Additionally, we account for the proportion of individuals with secondary and tertiary education, the proportion of Slavs and Jews by language, and the proportion of workers in industrial and agricultural sectors. These factors are measured based on the 1897 population levels and weighted by district population levels. We further include the share of serfs in 1858 as a control for each district. We introduce Stata's Bartlett test for the correlation structure. Latitude and longitude are included in the spatial environment argument of the model.

	Liberals		Kadets	
	(1) 60km	(2) 100km	(3) 60km	(4) 100km
Okhrana	−0.007***	−0.007***	0.005	0.005
	(0.002)	(0.002)	(0.006)	(0.007)
Male revolutionaries	0.009***	0.009***	0.002	0.002
	(0.003)	(0.003)	(0.010)	(0.011)
Propaganda	0.008	0.008	0.058**	0.058**
	(0.008)	(0.008)	(0.023)	(0.023)
Membership	0.017*	0.017*	−0.108***	−0.108***
	(0.010)	(0.010)	(0.029)	(0.029)
Riots	−0.006	−0.006	0.173**	0.173**
	(0.022)	(0.023)	(0.078)	(0.079)
Assassinations	−0.020***	−0.020***	0.027***	0.027***
	(0.007)	(0.007)	(0.009)	(0.009)
Constituency FE	0.000**	0.000*	−0.000	−0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Demographics	✓	✓	✓	✓
Geographics	✓	✓	✓	✓
Observations	6260	6260	6260	6260

Table B.3.22.: Spatial Correction with Arbitrary Clustering: Polarization & General Radicalization (Part A)

	PolIndex		Far Left		Moderate Left		Center	
	(1) 60km	(2) 100km	(3) 60km	(4) 100km	(5) 60km	(6) 100km	(7) 60km	(8) 100km
Okhrana	−0.045**	−0.045**	0.034	0.034	−0.003	−0.003	0.001	0.001
	(0.019)	(0.021)	(0.031)	(0.032)	(0.008)	(0.008)	(0.039)	(0.040)
Male revolutionaries	0.058**	0.058*	−0.022	−0.022	0.007	0.007	−0.052	−0.052
	(0.029)	(0.031)	(0.042)	(0.043)	(0.013)	(0.013)	(0.056)	(0.058)
Propaganda	−0.027	−0.027	0.032	0.032	−0.043	−0.043	−0.115	−0.115
	(0.068)	(0.069)	(0.074)	(0.077)	(0.027)	(0.029)	(0.088)	(0.092)
Membership	−0.017	−0.017	−0.245**	−0.245**	−0.119***	−0.119***	0.571***	0.571***
	(0.065)	(0.066)	(0.107)	(0.109)	(0.039)	(0.042)	(0.140)	(0.143)
Riots	0.449**	0.449**	0.361	0.361	0.281***	0.281***	−1.193***	−1.193***
	(0.187)	(0.195)	(0.263)	(0.274)	(0.084)	(0.092)	(0.338)	(0.357)
Assassinations	−0.028	−0.028	0.100*	0.100*	0.075***	0.075***	−0.172**	−0.172**
	(0.044)	(0.046)	(0.058)	(0.058)	(0.026)	(0.028)	(0.077)	(0.076)
Constituency FE	−0.000	−0.000	0.004***	0.004***	−0.001***	−0.001**	−0.002	−0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)	(0.002)
Demographics	✓	✓	✓	✓	✓	✓	✓	✓
Geographics	✓	✓	✓	✓	✓	✓	✓	✓
Observations	6600	6600	6260	6260	6260	6260	6260	6260

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The dependent variables were categorized into five political party groups using the Arzamas method and the researchers' own coding. The groups were based on cumulative vote shares and included far-left (right), moderate left (right), center, moderate right, and far-right. The far-left comprised Social Revolutionaries and Bolsheviks, moderate-left included Peasant and Cooperative parties, the center included Mensheviks, Social Revolutionaries, and other socialists, moderate-right included Orthodox, Muslim, Jewish, and minority parties, and the far-right included Commercial industrialists, landowners (referred to as Liberals), and the Kadets. The demographic controls came from two sources: Buggle and Nafziger (2021) and G. Kessler and Markevich (2017) and include district location factors, such as latitude, longitude, distance to the coastline, and global distance to the provincial capital and St. Petersburg. Other factors are the length of the growing season, presence of coal territories, and type of soil. Additionally, we account for the proportion of individuals with secondary and tertiary education, the proportion of Slavs and Jews by language, and the proportion of workers in industrial and agricultural sectors. These factors are measured based on the 1897 population levels and weighted by district population levels. We further include the share of serfs in 1858 as a control for each district. We introduce Stata's Bartlett test for the correlation structure. Latitude and longitude are included in the spatial environment argument of the model.

Table B.3.23.: Spatial Correction with Arbitrary Clustering: Polarization & General Radicalization (Part B)

	Moderate Right		Far Right	
	(1) 60km	(2) 100km	(3) 60km	(4) 100km
Okhrana	−0.031***	−0.031***	−0.001	−0.001
	(0.011)	(0.011)	(0.007)	(0.007)
Male revolutionaries	0.056***	0.056***	0.011	0.011
	(0.014)	(0.015)	(0.011)	(0.011)
Propaganda	0.060	0.060	0.066**	0.066**
	(0.057)	(0.057)	(0.026)	(0.026)
Membership	−0.117*	−0.117*	−0.091***	−0.091***
	(0.064)	(0.064)	(0.034)	(0.033)
Riots	0.385***	0.385***	0.167**	0.167**
	(0.131)	(0.132)	(0.082)	(0.083)
Assassinations	−0.011	−0.011	0.008	0.008
	(0.023)	(0.023)	(0.012)	(0.012)
Constituency FE	−0.001**	−0.001**	0.000	0.000
	(0.001)	(0.001)	(0.000)	(0.000)
Demographics	✓	✓	✓	✓
Geographics	✓	✓	✓	✓
Observations	6260	6260	6260	6260

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The dependent variables were categorized into five political party groups using the Arzamas method and the researchers' own coding. The groups were based on cumulative vote shares and included far-left (right), moderate left (right), center, moderate right, and far-right. The far-left comprised Social Revolutionaries and Bolsheviks, moderate-left included Peasant and Cooperative parties, the center included Mensheviks, Social Revolutionaries, and other socialists, moderate-right included Orthodox, Muslim, Jewish, and minority parties, and the far-right included Commercial industrialists, landowners (referred to as Liberals), and the Kadets. The demographic controls came from two sources: Buggle and Nafziger (2021) and G. Kessler and Markevich (2017) and include district location factors, such as latitude, longitude, distance to the coastline, and global distance to the provincial capital and St. Petersburg. Other factors are the length of the growing season, presence of coal territories, and type of soil. Additionally, we account for the proportion of individuals with secondary and tertiary education, the proportion of Slavs and Jews by language, and the proportion of workers in industrial and agricultural sectors. These factors are measured based on the 1897 population levels and weighted by district population levels. We further include the share of serfs in 1858 as a control for each district. We introduce Stata's Bartlett test for the correlation structure. Latitude and longitude are included in the spatial environment argument of the model.

Table B.3.24.: Spatial Correction with Arbitrary Clustering: Relative Radicalization

	Most left		Most right		Left-right range	
	(1) 60km	(2) 100km	(3) 60km	(4) 100km	(5) 60km	(6) 100km
Okhrana	−0.165*	−0.165*	−0.065	−0.065	0.100	0.100
	(0.095)	(0.096)	(0.047)	(0.048)	(0.114)	(0.117)
Male revolutionaries	0.206	0.206	0.146**	0.146*	−0.060	−0.060
	(0.139)	(0.141)	(0.072)	(0.074)	(0.175)	(0.180)
Propaganda	0.018	0.018	0.474***	0.474***	0.456	0.456
	(0.342)	(0.347)	(0.153)	(0.157)	(0.323)	(0.328)
Membership	0.745	0.745	−0.591***	−0.591***	−1.336***	−1.336***
	(0.478)	(0.479)	(0.200)	(0.202)	(0.457)	(0.460)
Riots	−1.182	−1.182	1.521***	1.521***	2.703**	2.703**
	(0.972)	(1.000)	(0.504)	(0.513)	(1.191)	(1.232)
Assassinations	−0.492*	−0.492*	−0.023	−0.023	0.469**	0.469**
	(0.267)	(0.268)	(0.092)	(0.094)	(0.221)	(0.225)
Constituency FE	−0.006	−0.006	−0.002	−0.002	0.005	0.005
	(0.004)	(0.005)	(0.002)	(0.002)	(0.004)	(0.004)
Demographics	✓	✓	✓	✓	✓	✓
Geographics	✓	✓	✓	✓	✓	✓
Observations	6260	6260	6260	6260	6260	6260

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The dependent variables refer to the left-right position of the most leftist and most rightist parties at the 1917 Constituency Assembly election. In addition, the district-level political spectrum is measured by calculating the absolute distance between the weighted position of the most leftist and most rightist parties at the election, based on their vote share and also utilized in the Manifesto project. The demographic controls came from two sources: Buggle and Nafziger (2021) and G. Kessler and Markevich (2017) and include district location factors, such as latitude, longitude, distance to the coastline, and global distance to the provincial capital and St. Petersburg. Other factors are the length of the growing season, presence of coal territories, and type of soil. Additionally, we account for the proportion of individuals with secondary and tertiary education, the proportion of Slavs and Jews by language, and the proportion of workers in industrial and agricultural sectors. These factors are measured based on the 1897 population levels and weighted by district population levels. We further include the share of serfs in 1858 as a control for each district. We introduce Stata's Bartlett test for the correlation structure. Latitude and longitude are included in the spatial environment argument of the model.

Table B.3.25.: Spatial Correction with Arbitrary Clustering: Median Party Status (Part A)

	Mensheviks		SRevol.		Bolsheviks		Jewish lists	
	(1) 60km	(2) 100km	(3) 60km	(4) 100km	(5) 60km	(6) 100km	(7) 60km	(8) 100km
Okhrana	−0.050	−0.050	0.058	0.058	0.000	0.000	0.039	0.039
	(0.032)	(0.032)	(0.039)	(0.037)	(.)	(.)	(0.036)	(0.040)
Male revolutionaries	0.091	0.091	−0.124**	−0.124**	0.000	0.000	−0.097*	−0.097
	(0.058)	(0.059)	(0.059)	(0.056)	(.)	(.)	(0.055)	(0.060)
Propaganda	−0.173*	−0.173*	−0.058	−0.058	0.000	0.000	0.643***	0.643***
	(0.096)	(0.101)	(0.098)	(0.105)	(.)	(.)	(0.124)	(0.133)
Membership	−0.175*	−0.175*	0.221	0.221	0.000	0.000	−0.535***	−0.535***
	(0.102)	(0.104)	(0.145)	(0.143)	(.)	(.)	(0.114)	(0.121)
Riots	0.617*	0.617	−0.525*	−0.525	0.000	0.000	−1.191***	−1.191***
	(0.373)	(0.385)	(0.315)	(0.320)	(.)	(.)	(0.353)	(0.371)
Assassinations	0.076	0.076	0.028	0.028	0.000	0.000	0.419***	0.419***
	(0.049)	(0.050)	(0.078)	(0.077)	(.)	(.)	(0.071)	(0.078)
Constituency FE	−0.000	−0.000	0.002	0.002	0.000	0.000	0.003	0.003
	(0.001)	(0.001)	(0.001)	(0.001)	(.)	(.)	(0.002)	(0.002)
Demographics	✓	✓	✓	✓	✓	✓	✓	✓
Geographics	✓	✓	✓	✓	✓	✓	✓	✓
Observations	6600	6600	6600	6600	6600	6600	6600	6600

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The Median Party status is dummy variable, coded as 1 if a party is a median party and 0 if not. The median party is calculated by ranking the party's votes and calculating the row median. A party is coded as a median party if its rank corresponds to the row median. Different parties with the same left-right position (e.g. alliances) are treated as one party with the cumulative vote share. The dependent variables refer to different political factions. Mensheviks encompasses the vote share for the center, leftist, and rightist factions of the Menshevik party. SRevol represents the vote share for the Social Revolutionaries, while Bolsheviks refers to any list where the Bolsheviks were the leading party. Jewish lists refers to the vote share for Jewish lists, such as Fareynikte, the Bund, or the Zionists. Liberals denotes the vote share for the Commercial Industrialists and Landowners, and Kadets represents the vote share for the most rightist party electable in the 1917 assembly. The demographic controls came from two sources: Buggle and Nafziger (2021) and G. Kessler and Markevich (2017) and include district location factors, such as latitude, longitude, distance to the coastline, and global distance to the provincial capital and St. Petersburg. Other factors are the length of the growing season, presence of coal territories, and type of soil. Additionally, we account for the proportion of individuals with secondary and tertiary education, the proportion of Slavs and Jews by language, and the proportion of workers in industrial and agricultural sectors. These factors are measured based on the 1897 population levels and weighted by district population levels. We further include the share of serfs in 1858 as a control for each district. We introduce Stata's Bartlett test for the correlation structure. Latitude and longitude are included in the spatial environment argument of the model.

Table B.3.26.: Spatial Correction with Arbitrary Clustering: Median Party Status (Part B)

	Liberals		Kadets	
	(1) 60km	(2) 100km	(3) 60km	(4) 100km
Okhrana	−0.057**	−0.057**	0.000	0.000
	(0.024)	(0.025)	(0.002)	(0.002)
Male revolutionaries	0.086**	0.086**	−0.001	−0.001
	(0.036)	(0.038)	(0.003)	(0.003)
Propaganda	−0.308**	−0.308**	0.002	0.002
	(0.120)	(0.128)	(0.006)	(0.007)
Membership	0.081	0.081	−0.029	−0.029
	(0.109)	(0.112)	(0.028)	(0.028)
Riots	0.373	0.373	0.060	0.060
	(0.253)	(0.273)	(0.060)	(0.059)
Assassinations	−0.007	−0.007	0.019	0.019
	(0.062)	(0.064)	(0.018)	(0.018)
Constituency FE	−0.005***	−0.005***	−0.000	−0.000
	(0.001)	(0.002)	(0.000)	(0.000)
Demographics	✓	✓	✓	✓
Geographics	✓	✓	✓	✓
Observations	6600	6600	6600	6600

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The Median Party status is dummy variable, coded as 1 if a party is a median party and 0 if not. The median party is calculated by ranking the party's votes and calculating the row median. A party is coded as a median party if its rank corresponds to the row median. Different parties with the same left-right position (e.g. alliances) are treated as one party with the cumulative vote share. The dependent variables refer to different political factions. Mensheviks encompasses the vote share for the center, leftist, and rightist factions of the Menshevik party. SRevol represents the vote share for the Social Revolutionaries, while Bolsheviks refers to any list where the Bolsheviks were the leading party. Jewish lists refers to the vote share for Jewish lists, such as Fareynikte, the Bund, or the Zionists. Liberals denotes the vote share for the Commercial Industrialists and Landowners, and Kadets represents the vote share for the most rightist party electable in the 1917 assembly. The demographic controls came from two sources: Buggle and Nafziger (2021) and G. Kessler and Markevich (2017) and include district location factors, such as latitude, longitude, distance to the coastline, and global distance to the provincial capital and St. Petersburg. Other factors are the length of the growing season, presence of coal territories, and type of soil. Additionally, we account for the proportion of individuals with secondary and tertiary education, the proportion of Slavs and Jews by language, and the proportion of workers in industrial and agricultural sectors. These factors are measured based on the 1897 population levels and weighted by district population levels. We further include the share of serfs in 1858 as a control for each district. We introduce Stata's Bartlett test for the correlation structure. Latitude and longitude are included in the spatial environment argument of the model.

Table B.3.27.: Coarsened matching results – reduced set of covariates

Variables	Coefficient	Number of Obs.	R-Squared
Individual Parties			
Mensheviks	0.035	58	0.023
	(0.031)		
SRevol	−0.091	58	0.039
	(0.060)		
Bolsheviks	−0.032	58	0.007
	(0.051)		
Jewish lists	0.016**	58	0.101
	(0.006)		
Liberals	0.002	58	0.002
	(0.005)		
Kadets	0.020*	58	0.062
	(0.010)		
General Radicalization			
Most left	0.081	58	0.003
	(0.197)		
Most right	0.154**	58	0.097
	(0.062)		
Left-right range	0.073	58	0.002
	(0.199)		
Relative Radicalization			
PolIndex	−0.033	65	0.011
	(0.039)		
Far Left	−0.032	58	0.007
	(0.051)		
Moderate Left	0.011*	58	0.053
	(0.006)		
Center	−0.055	58	0.018
	(0.054)		
Moderate Right	0.054**	58	0.087
	(0.023)		
Far Right	0.022**	58	0.074
	(0.010)		
Median Party			
Mensheviks	0.118**	65	0.060
	(0.059)		
SRevol.	−0.044	65	0.005
	(0.079)		
Jewish lists	−0.078	65	0.018
	(0.074)		

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses. Results for the Bolsheviks, Kadets and Liberals as median party in a given district are omitted. The Median Party status is dummy variable, coded as 1 if a party is a median party and 0 if not. The median party is calculated by ranking the party's votes and calculating the row median. A party is coded as a median party if its rank corresponds to the row median. Different parties with the same left-right position (e.g. alliances) are treated as one party with the cumulative vote share.

Table B.3.28.: Spatial autoregression: Individual Parties (Part A)

	Mensheviks			SRevol		
	(1) SAR	(2) SXL	(3) GNS	(4) SAR	(5) SXL	(6) GNS
Okhrana	0.001	0.027	−0.004	−0.005	−0.012	−0.003
	(0.013)	(0.018)	(0.013)	(0.019)	(0.024)	(0.024)
Male revolutionaries	0.002	−0.034	0.007	−0.027	−0.019	−0.039
	(0.021)	(0.027)	(0.019)	(0.029)	(0.034)	(0.032)
Constituency FE	−0.001**	−0.001*	−0.001	−0.001	−0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Propaganda	−0.033	0.020	0.019	−0.165*	−0.105	−0.073
	(0.050)	(0.051)	(0.049)	(0.086)	(0.106)	(0.109)
Membership	0.153*	0.073	0.112	0.243**	0.253*	0.189
	(0.083)	(0.081)	(0.070)	(0.110)	(0.133)	(0.138)
Riots	−0.310**	−0.412**	−0.325***	0.013	−0.143	−0.036
	(0.144)	(0.169)	(0.126)	(0.223)	(0.253)	(0.261)
Assassinations	−0.085	−0.024	−0.069	−0.057	−0.070	−0.018
	(0.063)	(0.060)	(0.057)	(0.063)	(0.076)	(0.076)
Spatial lags:						
Dependent Variable	6.166***		3.921	1.038***		1.283***
	(1.455)		(2.686)	(0.180)		(0.317)
Okhrana		0.020	−0.003		−0.042*	−0.060**
		(0.012)	(0.010)		(0.022)	(0.025)
Error Term			8.560*			4.686**
			(4.563)			(2.337)
Demographics	✓	✓	✓	✓	✓	✓
Geographics	✓	✓	✓	✓	✓	✓
Observations	313	313	313	313	313	313
Chi-squared	150.189	72.204	402.170	717.678	721.307	449.894
Model significance	0.000	0.000	0.000	0.000	0.000	0.000

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The dependent variables refer to different political factions. Mensheviks encompasses the vote share for the center, leftist, and rightist factions of the Menshevik party. SRevol represents the vote share for the Social Revolutionaries, while Bolsheviks refers to any list where the Bolsheviks were the leading party. Jewish lists refers to the vote share for Jewish lists, such as Fareynikte, the Bund, or the Zionists. Liberals denotes the vote share for the Commercial Industrialists and Landowners, and Kadets represents the vote share for the most rightist party electable in the 1917 assembly. The demographic controls came from two sources: Buggle and Nafziger (2021) and G. Kessler and Markevich (2017) and include district location factors, such as latitude, longitude, distance to the coastline, and global distance to the provincial capital and St. Petersburg. Other factors are the length of the growing season, presence of coal territories, and type of soil. Additionally, we account for the proportion of individuals with secondary and tertiary education, the proportion of Slavs and Jews by language, and the proportion of workers in industrial and agricultural sectors. These factors are measured based on the 1897 population levels and weighted by district population levels. We further include the share of serfs in 1858 as a control for each district. We introduce Stata's Bartlett test for the correlation structure. Latitude and longitude are included in the spatial environment argument of the model.

Table B.3.29.: Spatial autoregression: Individual Parties (Part B)

	Bolsheviks			Jewish lists		
	(1) SAR	(2) SXL	(3) GNS	(4) SAR	(5) SXL	(6) GNS
Okhrana	0.017	0.027	0.008	−0.007**	−0.007**	−0.008**
	(0.023)	(0.023)	(0.019)	(0.003)	(0.003)	(0.003)
Male revolutionaries	−0.020	−0.026	−0.001	0.013***	0.014***	0.014***
	(0.033)	(0.032)	(0.028)	(0.004)	(0.004)	(0.004)
Constituency FE	0.003***	0.004***	0.004***	0.000	0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
Propaganda	0.003	0.004	−0.028	0.025	0.020	0.023
	(0.085)	(0.077)	(0.088)	(0.029)	(0.030)	(0.028)
Membership	0.013	−0.011	0.075	−0.020	−0.019	−0.016
	(0.083)	(0.077)	(0.081)	(0.043)	(0.045)	(0.042)
Riots	−0.253	−0.298*	−0.300*	0.035	0.038	0.042
	(0.199)	(0.177)	(0.178)	(0.073)	(0.076)	(0.071)
Assassinations	0.018	0.024	−0.035	−0.009	−0.008	−0.011
	(0.046)	(0.044)	(0.042)	(0.016)	(0.015)	(0.016)
Spatial lags:						
Dependent Variable	0.348		−0.015	−1.846		−1.574
	(0.231)		(0.318)	(1.143)		(0.991)
Okhrana		0.043***	0.039**		−0.006	−0.004
		(0.016)	(0.016)		(0.004)	(0.003)
Error Term			3.385**			0.517
			(1.493)			(2.499)
Demographics	✓	✓	✓	✓	✓	✓
Geographics	✓	✓	✓	✓	✓	✓
Observations	313	313	313	313	313	313
Chi-squared	930.078	1975.530	397.613	290.664	248.567	662.132
Model significance	0.000	0.000	0.000	0.000	0.000	0.000

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The dependent variables refer to different political factions. Mensheviks encompasses the vote share for the center, leftist, and rightist factions of the Menshevik party. SRevol represents the vote share for the Social Revolutionaries, while Bolsheviks refers to any list where the Bolsheviks were the leading party. Jewish lists refers to the vote share for Jewish lists, such as Fareynikte, the Bund, or the Zionists. Liberals denotes the vote share for the Commercial Industrialists and Landowners, and Kadets represents the vote share for the most rightist party electable in the 1917 assembly. The demographic controls came from two sources: Buggle and Nafziger (2021) and G. Kessler and Markevich (2017) and include district location factors, such as latitude, longitude, distance to the coastline, and global distance to the provincial capital and St. Petersburg. Other factors are the length of the growing season, presence of coal territories, and type of soil. Additionally, we account for the proportion of individuals with secondary and tertiary education, the proportion of Slavs and Jews by language, and the proportion of workers in industrial and agricultural sectors. These factors are measured based on the 1897 population levels and weighted by district population levels. We further include the share of serfs in 1858 as a control for each district. We introduce Stata's Bartlett test for the correlation structure. Latitude and longitude are included in the spatial environment argument of the model.

Table B.3.30.: Spatial autoregression: Individual Parties (Part C)

	Liberals			Kadets		
	(1) SAR	(2) SXL	(3) GNS	(4) SAR	(5) SXL	(6) GNS
Okhrana	−0.004**	−0.006***	−0.003*	0.005	0.004	0.008
	(0.002)	(0.002)	(0.002)	(0.006)	(0.006)	(0.007)
Male revolutionaries	0.006**	0.009***	0.005**	0.002	0.002	−0.002
	(0.003)	(0.003)	(0.003)	(0.010)	(0.010)	(0.011)
Constituency FE	0.000	0.000**	0.000	−0.000	−0.000	−0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Propaganda	−0.003	0.007	−0.003	0.060**	0.059***	0.074***
	(0.007)	(0.008)	(0.007)	(0.023)	(0.023)	(0.023)
Membership	0.015*	0.017*	0.014	−0.108***	−0.106***	−0.124***
	(0.009)	(0.010)	(0.009)	(0.030)	(0.029)	(0.029)
Riots	0.003	−0.007	0.005	0.185**	0.175**	0.184**
	(0.020)	(0.023)	(0.020)	(0.079)	(0.077)	(0.077)
Assassinations	−0.014***	−0.020***	−0.013***	0.027***	0.028***	0.034***
	(0.005)	(0.007)	(0.005)	(0.010)	(0.009)	(0.010)
Spatial lags:						
Dependent Variable	2.957***		3.015***	0.945**		0.139
	(0.424)		(0.505)	(0.451)		(0.556)
Okhrana		0.003*	0.000		−0.007	−0.000
		(0.002)	(0.001)		(0.006)	(0.006)
Error Term			1.829***			2.875***
			(0.544)			(0.652)
Demographics	✓	✓	✓	✓	✓	✓
Geographics	✓	✓	✓	✓	✓	✓
Observations	313	313	313	313	313	313
Chi-squared	314.545	205.676	240.993	312.798	307.669	170.538
Model significance	0.000	0.000	0.000	0.000	0.000	0.000

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The dependent variables refer to different political factions. Mensheviks encompasses the vote share for the center, leftist, and rightist factions of the Menshevik party. SRevol represents the vote share for the Social Revolutionaries, while Bolsheviks refers to any list where the Bolsheviks were the leading party. Jewish lists refers to the vote share for Jewish lists, such as Fareynikte, the Bund, or the Zionists. Liberals denotes the vote share for the Commercial Industrialists and Landowners, and Kadets represents the vote share for the most rightist party electable in the 1917 assembly. The demographic controls came from two sources: Buggle and Nafziger (2021) and G. Kessler and Markevich (2017) and include district location factors, such as latitude, longitude, distance to the coastline, and global distance to the provincial capital and St. Petersburg. Other factors are the length of the growing season, presence of coal territories, and type of soil. Additionally, we account for the proportion of individuals with secondary and tertiary education, the proportion of Slavs and Jews by language, and the proportion of workers in industrial and agricultural sectors. These factors are measured based on the 1897 population levels and weighted by district population levels. We further include the share of serfs in 1858 as a control for each district. We introduce Stata's Bartlett test for the correlation structure. Latitude and longitude are included in the spatial environment argument of the model.

Table B.3.31.: Spillover effects: Individual parties

	Direct Effects	Indirect Effects	Total Effects
	Mensheviks		
SAR	0.001	−0.000	0.000
	(0.014)	(0.009)	(0.010)
SLX	0.027	0.018	0.046*
	(0.018)	(0.011)	(0.024)
GNS	−0.004	0.007	0.003
	(0.012)	(0.028)	(0.020)
	SRevol		
SAR	−0.005	0.123	0.119
	(0.018)	(0.781)	(0.771)
SLX	−0.012	−0.039*	−0.051
	(0.024)	(0.020)	(0.036)
GNS	−0.003	0.204	0.201
	(0.024)	(0.292)	(0.282)
	Bolsheviks		
SAR	0.017	0.008	0.025
	(0.024)	(0.013)	(0.035)
SLX	0.027	0.040***	0.067**
	(0.023)	(0.015)	(0.030)
GNS	0.008	0.035*	0.043
	(0.019)	(0.021)	(0.029)
	Jewish lists		
SAR	−0.007**	0.004	−0.003**
	(0.003)	(0.003)	(0.001)
SLX	−0.007**	−0.005	−0.013*
	(0.003)	(0.004)	(0.007)
GNS	−0.008**	0.003	−0.005**
	(0.003)	(0.003)	(0.002)
	Liberals		
SAR	−0.004*	0.003	−0.001
	(0.002)	(0.010)	(0.012)
SLX	−0.006***	0.003*	−0.003
	(0.002)	(0.002)	(0.003)
GNS	−0.004	−0.000	−0.005
	(0.010)	(0.057)	(0.067)
	Kadets		
SAR	0.005	0.074	0.079
	(0.007)	(0.644)	(0.648)
SLX	0.004	−0.007	−0.002
	(0.006)	(0.005)	(0.009)
GNS	0.008	0.001	0.009
	(0.007)	(0.008)	(0.012)

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors
in parentheses.

Table B.3.32.: Spatial autoregression: Polarization & General Radicalization (Part A)

	PolIndex			Far Left		
	(1) SAR	(2) SXL	(3) GNS	(4) SAR	(5) SXL	(6) GNS
Okhrana	−0.045**	−0.047***	−0.029**	0.027	0.036	0.009
	(0.018)	(0.018)	(0.014)	(0.031)	(0.031)	(0.026)
Male revolutionaries	0.056**	0.061**	0.038*	−0.016	−0.023	0.009
	(0.027)	(0.027)	(0.021)	(0.042)	(0.042)	(0.035)
Constituency FE	−0.000	−0.000	0.000	0.003***	0.004***	0.003***
	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)
Propaganda	−0.044	−0.024	0.003	0.018	0.029	−0.015
	(0.059)	(0.063)	(0.048)	(0.076)	(0.073)	(0.074)
Membership	−0.005	−0.019	−0.005	−0.214**	−0.248**	−0.109
	(0.063)	(0.064)	(0.054)	(0.109)	(0.108)	(0.098)
Riots	0.479***	0.477***	0.259**	0.399	0.354	0.281
	(0.170)	(0.167)	(0.128)	(0.264)	(0.262)	(0.244)
Assassinations	−0.027	−0.029	−0.029	0.085	0.099*	0.018
	(0.043)	(0.042)	(0.035)	(0.061)	(0.059)	(0.058)
Spatial lags:						
Dependent Variable	0.487***		0.198	0.622**		0.423
	(0.153)		(0.186)	(0.275)		(0.422)
Okhrana		−0.015	−0.000		0.018	0.020
		(0.011)	(0.009)		(0.020)	(0.021)
Error Term			4.885***			3.510*
			(1.163)			(2.062)
Demographics	✓	✓	✓	✓	✓	✓
Geographics	✓	✓	✓	✓	✓	✓
Observations	330	330	330	313	313	313
Chi-squared	804.864	1038.447	645.768	888.813	1350.181	244.181
Model significance	0.000	0.000	0.000	0.000	0.000	0.000

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The dependent variables were categorized into five political party groups using the Arzamas method and the researchers' own coding. The groups were based on cumulative vote shares and included far-left (right), moderate left (right), center, moderate right, and far-right. The far-left comprised Social Revolutionaries and Bolsheviks, moderate-left included Peasant and Cooperative parties, the center included Mensheviks, Social Revolutionaries, and other socialists, moderate-right included Orthodox, Muslim, Jewish, and minority parties, and the far-right included Commercial industrialists, landowners (referred to as Liberals), and the Kadets. The demographic controls came from two sources: Buggle and Nafziger (2021) and G. Kessler and Markevich (2017) and include district location factors, such as latitude, longitude, distance to the coastline, and global distance to the provincial capital and St. Petersburg. Other factors are the length of the growing season, presence of coal territories, and type of soil. Additionally, we account for the proportion of individuals with secondary and tertiary education, the proportion of Slavs and Jews by language, and the proportion of workers in industrial and agricultural sectors. These factors are measured based on the 1897 population levels and weighted by district population levels. We further include the share of serfs in 1858 as a control for each district. We introduce Stata's Bartlett test for the correlation structure. Latitude and longitude are included in the spatial environment argument of the model.

Table B.3.33.: Spatial autoregression: Polarization & General Radicalization (Part B)

	Moderate Left			Center		
	(1) SAR	(2) SXL	(3) GNS	(4) SAR	(5) SXL	(6) GNS
Okhrana	0.008	−0.003	0.003	−0.003	0.001	−0.019
	(0.010)	(0.008)	(0.012)	(0.031)	(0.040)	(0.032)
Male revolutionaries	−0.007	0.007	−0.002	−0.050	−0.052	−0.028
	(0.016)	(0.013)	(0.019)	(0.045)	(0.056)	(0.045)
Constituency FE	−0.001**	−0.001***	−0.002***	−0.002*	−0.002	−0.001
	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.002)
Propaganda	−0.064**	−0.042	−0.081***	−0.195***	−0.115	−0.119
	(0.032)	(0.027)	(0.028)	(0.075)	(0.088)	(0.094)
Membership	−0.092**	−0.118***	−0.056*	0.579***	0.571***	0.522***
	(0.038)	(0.038)	(0.033)	(0.120)	(0.139)	(0.152)
Riots	0.226***	0.282***	0.237***	−0.931***	−1.193***	−0.852***
	(0.078)	(0.083)	(0.073)	(0.287)	(0.336)	(0.313)
Assassinations	0.071***	0.075***	0.050*	−0.166**	−0.172**	−0.162
	(0.027)	(0.026)	(0.027)	(0.071)	(0.077)	(0.100)
Spatial lags:						
Dependent Variable	5.098**		7.289*	1.274***		1.414***
	(2.098)		(4.296)	(0.184)		(0.286)
Okhrana		−0.004	−0.012		−0.001	−0.060*
		(0.009)	(0.008)		(0.026)	(0.032)
Error Term			5.834***			5.075*
			(2.214)			(2.965)
Demographics	✓	✓	✓	✓	✓	✓
Geographics	✓	✓	✓	✓	✓	✓
Observations	313	313	313	313	313	313
Chi-squared	28.747	24.975	149.817	643.526	382.845	413.041
Model significance	0.230	0.407	0.000	0.000	0.000	0.000

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The dependent variables were categorized into five political party groups using the Arzamas method and the researchers' own coding. The groups were based on cumulative vote shares and included far-left (right), moderate left (right), center, moderate right, and far-right. The far-left comprised Social Revolutionaries and Bolsheviks, moderate-left included Peasant and Cooperative parties, the center included Mensheviks, Social Revolutionaries, and other socialists, moderate-right included Orthodox, Muslim, Jewish, and minority parties, and the far-right included Commercial industrialists, landowners (referred to as Liberals), and the Kadets. The demographic controls came from two sources: Buggle and Nafziger (2021) and G. Kessler and Markevich (2017) and include district location factors, such as latitude, longitude, distance to the coastline, and global distance to the provincial capital and St. Petersburg. Other factors are the length of the growing season, presence of coal territories, and type of soil. Additionally, we account for the proportion of individuals with secondary and tertiary education, the proportion of Slavs and Jews by language, and the proportion of workers in industrial and agricultural sectors. These factors are measured based on the 1897 population levels and weighted by district population levels. We further include the share of serfs in 1858 as a control for each district. We introduce Stata's Bartlett test for the correlation structure. Latitude and longitude are included in the spatial environment argument of the model.

Table B.3.34.: Spatial autoregression: Polarization & General Radicalization (Part C)

	Moderate Right			Far Right		
	(1) SAR	(2) SXL	(3) GNS	(4) SAR	(5) SXL	(6) GNS
Okhrana	−0.032***	−0.033***	−0.026**	−0.001	−0.002	0.004
	(0.010)	(0.011)	(0.011)	(0.007)	(0.007)	(0.007)
Male revolutionaries	0.057***	0.056***	0.049***	0.010	0.011	0.004
	(0.014)	(0.015)	(0.015)	(0.011)	(0.011)	(0.011)
Constituency FE	−0.001**	−0.001**	−0.002**	−0.000	0.000	−0.000
	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
Propaganda	0.061	0.062	0.062	0.064**	0.067***	0.074***
	(0.055)	(0.056)	(0.058)	(0.027)	(0.026)	(0.027)
Membership	−0.114*	−0.115*	−0.125*	−0.092***	−0.090***	−0.111***
	(0.064)	(0.065)	(0.068)	(0.034)	(0.034)	(0.034)
Riots	0.384***	0.388***	0.372***	0.182**	0.168**	0.186**
	(0.130)	(0.132)	(0.135)	(0.083)	(0.081)	(0.082)
Assassinations	−0.013	−0.010	−0.003	0.009	0.008	0.019*
	(0.023)	(0.023)	(0.025)	(0.011)	(0.012)	(0.011)
Spatial lags:						
Dependent Variable	−0.672		−0.698	1.002**		0.490
	(0.977)		(2.312)	(0.427)		(0.480)
Okhrana		−0.009	0.002		−0.004	0.001
		(0.010)	(0.010)		(0.006)	(0.007)
Error Term			4.751***			3.270***
			(1.122)			(0.937)
Demographics	✓	✓	✓	✓	✓	✓
Geographics	✓	✓	✓	✓	✓	✓
Observations	313	313	313	313	313	313
Chi-squared	204.750	199.833	101.551	256.102	254.045	199.729
Model significance	0.000	0.000	0.000	0.000	0.000	0.000

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The dependent variables were categorized into five political party groups using the Arzamas method and the researchers' own coding. The groups were based on cumulative vote shares and included far-left (right), moderate left (right), center, moderate right, and far-right. The far-left comprised Social Revolutionaries and Bolsheviks, moderate-left included Peasant and Cooperative parties, the center included Mensheviks, Social Revolutionaries, and other socialists, moderate-right included Orthodox, Muslim, Jewish, and minority parties, and the far-right included Commercial industrialists, landowners (referred to as Liberals), and the Kadets. The demographic controls came from two sources: Buggle and Nafziger (2021) and G. Kessler and Markevich (2017) and include district location factors, such as latitude, longitude, distance to the coastline, and global distance to the provincial capital and St. Petersburg. Other factors are the length of the growing season, presence of coal territories, and type of soil. Additionally, we account for the proportion of individuals with secondary and tertiary education, the proportion of Slavs and Jews by language, and the proportion of workers in industrial and agricultural sectors. These factors are measured based on the 1897 population levels and weighted by district population levels. We further include the share of serfs in 1858 as a control for each district. We introduce Stata's Bartlett test for the correlation structure. Latitude and longitude are included in the spatial environment argument of the model.

Table B.3.35.: Spillover effects: Relative radicalization

	Direct Effects	Indirect Effects	Total Effects
	PolIndex		
SAR	−0.045**	−0.039	−0.085**
	(0.018)	(0.026)	(0.037)
SLX	−0.047***	−0.014	−0.061***
	(0.018)	(0.011)	(0.020)
GNS	−0.029**	−0.007	−0.036*
	(0.014)	(0.012)	(0.020)
	Far Left		
SAR	0.027	0.040	0.067
	(0.031)	(0.065)	(0.089)
SLX	0.036	0.017	0.053
	(0.031)	(0.019)	(0.041)
GNS	0.009	0.038	0.047
	(0.026)	(0.058)	(0.072)
	Moderate Left		
SAR	0.007	−0.009	−0.002
	(0.014)	(0.012)	(0.005)
SLX	−0.003	−0.004	−0.007
	(0.008)	(0.008)	(0.012)
GNS	0.003	−0.001	0.001
	(0.013)	(0.015)	(0.002)
	Center		
SAR	−0.002	0.011	0.008
	(0.030)	(0.127)	(0.096)
SLX	0.001	−0.001	0.000
	(0.040)	(0.024)	(0.052)
GNS	−0.019	0.188	0.169
	(0.032)	(0.178)	(0.161)
	Moderate Right		
SAR	−0.032***	0.012	−0.020
	(0.011)	(0.012)	(0.012)
SLX	−0.033***	−0.009	−0.041**
	(0.011)	(0.009)	(0.017)
GNS	−0.026**	0.011	−0.015
	(0.011)	(0.018)	(0.022)
	Far Right		
SAR	0.001	0.499	0.500
	(0.473)	(133.856)	(134.329)
SLX	−0.002	−0.004	−0.005
	(0.007)	(0.006)	(0.010)
GNS	0.004	0.004	0.008
	(0.007)	(0.016)	(0.021)

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors in parentheses.

Table B.3.36.: Spatial autoregression: Relative Radicalization

	Most left			Most right			Left-right range		
	(1) SAR	(2) SXL	(3) GNS	(4) SAR	(5) SXL	(6) GNS	(7) SAR	(8) SXL	(9) GNS
Okhrana	−0.155	−0.174*	−0.062	−0.060	−0.071	−0.019	0.094	0.103	0.057
	(0.097)	(0.097)	(0.096)	(0.049)	(0.048)	(0.046)	(0.116)	(0.116)	(0.100)
Male revolutionaries	0.199	0.208	0.091	0.136*	0.147**	0.085	−0.057	−0.061	−0.022
	(0.141)	(0.139)	(0.132)	(0.074)	(0.073)	(0.069)	(0.177)	(0.175)	(0.145)
Constituency FE	−0.005	−0.007*	−0.004	−0.002	−0.002	−0.003	0.004	0.005	−0.002
	(0.004)	(0.004)	(0.004)	(0.002)	(0.002)	(0.002)	(0.004)	(0.004)	(0.005)
Propaganda	0.070	0.031	0.264	0.471***	0.482***	0.563***	0.420	0.451	0.310
	(0.352)	(0.342)	(0.343)	(0.154)	(0.150)	(0.135)	(0.330)	(0.321)	(0.310)
Membership	0.689	0.758	0.162	−0.611***	−0.583***	−0.742***	−1.301***	−1.340***	−0.990**
	(0.479)	(0.480)	(0.482)	(0.203)	(0.200)	(0.184)	(0.459)	(0.456)	(0.424)
Riots	−1.306	−1.158	−0.989	1.629***	1.537***	1.599***	2.802**	2.695**	2.620***
	(0.964)	(0.978)	(0.915)	(0.525)	(0.500)	(0.483)	(1.196)	(1.191)	(1.009)
Assassinations	−0.471*	−0.487*	−0.176	−0.006	−0.019	0.066	0.457**	0.467**	0.299
	(0.272)	(0.270)	(0.301)	(0.094)	(0.093)	(0.088)	(0.225)	(0.222)	(0.244)
Spatial lags:									
Dependent Variable	0.254		0.612**	1.304*		−0.035	0.173		0.351
	(0.215)		(0.287)	(0.711)		(0.866)	(0.194)		(0.251)
Okhrana		−0.068	−0.086		−0.045	0.018		0.023	0.086
		(0.096)	(0.096)		(0.039)	(0.039)		(0.094)	(0.092)
Error Term			4.044*			3.637***			3.510*
			(2.228)			(0.764)			(2.100)
Demographics	✓	✓	✓	✓	✓	✓	✓	✓	✓
Geographics	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	313	313	313	313	313	313	313	313	313
Chi-squared	887.236	625.944	200.091	193.247	195.056	156.378	560.621	627.149	229.553
Model significance	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The dependent variables refer to the left-right position of the most leftist and most rightist parties at the 1917 Constituency Assembly election. In addition, the district-level political spectrum is measured by calculating the absolute distance between the weighted position of the most leftist and most rightist parties at the election, based on their vote share and also utilized in the Manifesto project. The demographic controls came from two sources: Buggle and Nafziger (2021) and G. Kessler and Markevich (2017) and include district location factors, such as latitude, longitude, distance to the coastline, and global distance to the provincial capital and St. Petersburg. Other factors are the length of the growing season, presence of coal territories, and type of soil. Additionally, we account for the proportion of individuals with secondary and tertiary education, the proportion of Slavs and Jews by language, and the proportion of workers in industrial and agricultural sectors. These factors are measured based on the 1897 population levels and weighted by district population levels. We further include the share of serfs in 1858 as a control for each district. We introduce Stata's Bartlett test for the correlation structure. Latitude and longitude are included in the spatial environment argument of the model.

Table B.3.37.: Spillover effects: General radicalization

	Direct Effects	Indirect Effects	Total Effects
Most left			
SAR	−0.155	−0.048	−0.204
	(0.098)	(0.061)	(0.136)
SLX	−0.174*	−0.063	−0.237
	(0.097)	(0.089)	(0.149)
GNS	−0.063	−0.290	−0.353
	(0.096)	(0.387)	(0.433)
Most right			
SAR	−0.060	0.231	0.171
	(0.048)	(0.468)	(0.450)
SLX	−0.071	−0.042	−0.113*
	(0.048)	(0.036)	(0.064)
GNS	−0.019	0.017	−0.002
	(0.046)	(0.035)	(0.063)
Left-right range			
SAR	0.094	0.018	0.112
	(0.116)	(0.032)	(0.139)
SLX	0.103	0.021	0.124
	(0.116)	(0.087)	(0.162)
GNS	0.057	0.149	0.206
	(0.101)	(0.171)	(0.232)

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors in parentheses.

Table B.3.38.: Spatial autoregression: Median Party Status (Part A)

	Mensheviks			SRevol.			Jewish lists		
	(1) SAR	(2) SXL	(3) GNS	(4) SAR	(5) SXL	(6) GNS	(7) SAR	(8) SXL	(9) GNS
Okhrana	−0.030	−0.052*	−0.034	0.021	0.055	0.010	−0.010	0.045	−0.019
	(0.031)	(0.031)	(0.029)	(0.038)	(0.038)	(0.037)	(0.031)	(0.036)	(0.026)
Male revolutionaries	0.058	0.093*	0.065	−0.066	−0.120**	−0.051	−0.026	−0.105**	−0.004
	(0.056)	(0.056)	(0.053)	(0.056)	(0.058)	(0.055)	(0.045)	(0.053)	(0.038)
Constituency FE	0.001	−0.000	0.001	0.002	0.001	0.001	0.000	0.003**	0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)
Propaganda	−0.195*	−0.171*	−0.202*	−0.200*	−0.055	−0.214*	0.442***	0.637***	0.281***
	(0.103)	(0.093)	(0.105)	(0.108)	(0.097)	(0.110)	(0.112)	(0.114)	(0.083)
Membership	−0.154	−0.176*	−0.173	0.299*	0.219	0.310**	−0.250**	−0.531***	−0.100
	(0.106)	(0.101)	(0.111)	(0.154)	(0.144)	(0.155)	(0.104)	(0.113)	(0.089)
Riots	0.465	0.636*	0.543*	−0.452	−0.490	−0.362	−0.934***	−1.263***	−0.934***
	(0.329)	(0.357)	(0.321)	(0.320)	(0.310)	(0.308)	(0.324)	(0.341)	(0.259)
Assassinations	0.106*	0.075	0.112**	−0.019	0.026	−0.031	0.224***	0.423***	0.131**
	(0.056)	(0.048)	(0.056)	(0.078)	(0.078)	(0.078)	(0.071)	(0.069)	(0.061)
Spatial lags:									
Dependent Variable	3.676***		3.797***	3.799***		4.401***	3.168***		3.963***
	(1.372)		(1.033)	(1.118)		(1.118)	(0.359)		(0.546)
Okhrana		−0.011	−0.014		−0.019	−0.042***		0.040**	0.079***
		(0.010)	(0.010)		(0.013)	(0.015)		(0.017)	(0.018)
Error Term			−2.084			0.471			3.720
			(3.479)			(1.722)			(2.486)
Demographics	✓	✓	✓	✓	✓	✓	✓	✓	✓
Geographics	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	330	330	330	330	330	330	330	330	330
Chi-squared	23.487	22.318	61.435	138.257	208.129	344.190	496.587	701.474	405.528
Model significance	0.491	0.560	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The Median Party status is dummy variable, coded as 1 if a party is a median party and 0 if not. The median party is calculated by ranking the party's votes and calculating the row median. A party is coded as a median party if its rank corresponds to the row median. Different parties with the same left-right position (e.g. alliances) are treated as one party with the cumulative vote share. The demographic controls came from two sources: Buggle and Nafziger (2021) and G. Kessler and Markevich (2017) and include district location factors, such as latitude, longitude, distance to the coastline, and global distance to the provincial capital and St. Petersburg. Other factors are the length of the growing season, presence of coal territories, and type of soil. Additionally, we account for the proportion of individuals with secondary and tertiary education, the proportion of Slavs and Jews by language, and the proportion of workers in industrial and agricultural sectors. These factors are measured based on the 1897 population levels and weighted by district population levels. We further include the share of serfs in 1858 as a control for each district. We introduce Stata's Bartlett test for the correlation structure. Latitude and longitude are included in the spatial environment argument of the model.

Table B.3.39.: Spatial autoregression: Median Party Status (Part B)

	Liberals			Kadets		
	(1) SAR	(2) SXL	(3) GNS	(4) SAR	(5) SXL	(6) GNS
Okhrana	−0.034	−0.047*	−0.024	0.004	0.000	0.002
	(0.024)	(0.024)	(0.024)	(0.005)	(0.002)	(0.003)
Male revolutionaries	0.047	0.074*	0.034	−0.007	−0.001	−0.004
	(0.037)	(0.038)	(0.038)	(0.008)	(0.003)	(0.005)
Constituency FE	−0.003**	−0.004***	−0.002*	−0.000	−0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
Propaganda	−0.167	−0.318**	−0.160	0.002	0.002	−0.001
	(0.127)	(0.129)	(0.135)	(0.007)	(0.006)	(0.009)
Membership	−0.048	0.087	−0.048	−0.010	−0.029	−0.026
	(0.116)	(0.110)	(0.116)	(0.013)	(0.029)	(0.021)
Riots	0.273	0.254	0.160	0.007	0.062	0.040
	(0.273)	(0.269)	(0.291)	(0.025)	(0.061)	(0.033)
Assassinations	0.073	0.000	0.077	0.011	0.019	0.019
	(0.070)	(0.065)	(0.071)	(0.012)	(0.018)	(0.014)
Spatial lags:						
Dependent Variable	6.015***		5.825***	8.102		6.980**
	(1.393)		(1.545)	(8.424)		(3.347)
Okhrana		0.065***	0.053**		−0.001	−0.001
		(0.021)	(0.024)		(0.001)	(0.001)
Error Term			1.393**			−8.894***
			(0.591)			(1.940)
Demographics	✓	✓	✓	✓	✓	✓
Geographics	✓	✓	✓	✓	✓	✓
Observations	330	330	330	330	330	330
Chi-squared	277.715	440.485	605.292	0.969	1.104	161.524
Model significance	0.000	0.000	0.000	1.000	1.000	0.000

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The Median Party status is dummy variable, coded as 1 if a party is a median party and 0 if not. The median party is calculated by ranking the party's votes and calculating the row median. A party is coded as a median party if its rank corresponds to the row median. Different parties with the same left-right position (e.g. alliances) are treated as one party with the cumulative vote share. The demographic controls came from two sources: Buggle and Nafziger (2021) and G. Kessler and Markevich (2017) and include district location factors, such as latitude, longitude, distance to the coastline, and global distance to the provincial capital and St. Petersburg. Other factors are the length of the growing season, presence of coal territories, and type of soil. Additionally, we account for the proportion of individuals with secondary and tertiary education, the proportion of Slavs and Jews by language, and the proportion of workers in industrial and agricultural sectors. These factors are measured based on the 1897 population levels and weighted by district population levels. We further include the share of serfs in 1858 as a control for each district. We introduce Stata's Bartlett test for the correlation structure. Latitude and longitude are included in the spatial environment argument of the model.

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Table B.3.40.: Spillover effects: Median parties

	Direct Effects	Indirect Effects	Total Effects
Mensheviks			
SAR	−0.028	0.047	0.019
	(0.035)	(0.079)	(0.085)
SLX	−0.052*	−0.010	−0.062*
	(0.031)	(0.009)	(0.034)
GNS	−0.033	0.054	0.021
	(0.030)	(0.048)	(0.037)
SRevol.			
SAR	0.020	−0.030	−0.010
	(0.036)	(0.057)	(0.028)
SLX	0.055	−0.018	0.037
	(0.038)	(0.012)	(0.039)
GNS	0.011	−0.001	0.009
	(0.040)	(0.046)	(0.007)
Jewish lists			
SAR	−0.009	0.016	0.007
	(0.030)	(0.049)	(0.023)
SLX	0.045	0.037**	0.082**
	(0.036)	(0.016)	(0.039)
GNS	−0.019	−0.002	−0.020*
	(0.025)	(0.036)	(0.012)
Liberals			
SAR	−0.035	0.028	−0.006
	(0.031)	(0.060)	(0.075)
SLX	−0.047*	0.060***	0.013
	(0.024)	(0.020)	(0.032)
GNS	−0.023	0.014	−0.009
	(0.024)	(0.023)	(0.010)
Kadets			
SAR	0.002	−0.005	−0.002
	(0.270)	(0.094)	(0.176)
SLX	0.000	−0.001	−0.000
	(0.002)	(0.001)	(0.002)
GNS	0.002	−0.003	−0.000
	(0.006)	(0.003)	(0.003)

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Standard errors in parentheses. Results for the Bolsheviks as median party in a given district are omitted.

Table B.3.41.: Average Treatment Effect (ATT) & Sensitivity Analysis: Median Party

Variable	Mensheviks	SRevol.	Bolsheviks	Jewish lists	Liberals
	Panel A: Kernel-Based Matching				
	(1)	(2)	(3)	(4)	(5)
ATT – Okhrana	0.048**	0.058	0.000	−0.161***	0.029*
	(0.019)	(0.063)	(.)	(0.056)	(0.017)
Demographics	✓	✓	✓	✓	✓
Geographics	✓	✓	✓	✓	✓
Treated	189	189	189	189	189
Control	180	180	180	180	180
$\Gamma(sigm+ < 0.05)$	8	28	1	22	14
Observations	369	369	369	369	369
	Panel B: Neighrest-Neighbor Matching				
	(1)	(2)	(3)	(4)	(5)
ATT – Okhrana	0.053	0.027	0.000	−0.193***	0.013
	(.)	(0.075)	(.)	(0.073)	(0.026)
Demographics	✓	✓	✓	✓	✓
Geographics	✓	✓	✓	✓	✓
Treated	189	189	189	189	189
Control	180	180	180	180	180
$\Gamma(sigm+ < 0.05)$	8	28	1	22	14
Observations	369	369	369	369	369

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard error in parentheses. NNM ==1. Common support is imposed. The Median Party status is dummy variable, coded as 1 if a party is a median party and 0 if not. The median party is calculated by ranking the party's votes and calculating the row median. A party is coded as a median party if its rank corresponds to the row median. Different parties with the same left-right position (e.g. alliances) are treated as one party with the cumulative vote share. The dependent variables refer to different political factions. Mensheviks encompasses the vote share for the center, leftist, and rightist factions of the Menshevik party. SRevol represents the vote share for the Social Revolutionaries, while Bolsheviks refers to any list where the Bolsheviks were the leading party. Jewish lists refers to the vote share for Jewish lists, such as Fareynikte, the Bund, or the Zionists. Liberals denotes the vote share for the Commercial Industrialists and Landowners, and Kadets represents the vote share for the most rightist party electable in the 1917 assembly. The demographic controls came from two sources: Buggle and Nafziger (2021) and G. Kessler and Markevich (2017) and include district location factors, such as latitude, longitude, distance to the coastline, and global distance to the provincial capital and St. Petersburg. Other factors are the length of the growing season, presence of coal territories, and type of soil. Additionally, we account for the proportion of individuals with secondary and tertiary education, the proportion of Slavs and Jews by language, and the proportion of workers in industrial and agricultural sectors. These factors are measured based on the 1897 population levels and weighted by district population levels. We further include the share of serfs in 1858 as a control for each district.

Table B.3.42.: Matching Results for Okhrana Coarsening: Reduced Set of Covariates

```
Matching Summary:
-----------------
Number of strata: 173
Number of matched strata: 39
              0    1
       All  199  250
   Matched  111  133
 Unmatched   88  117

Multivariate L1 distance: .77033493

Univariate imbalance:
                         L1     mean      min      25%      50%      75%      max
            latitude  .12796  -.07366  -1.1361   .18577  -.12966  -.07625   .83248
           longitude  .10269  -.70544  -3.3532  -.12889   .29314  -1.0323   .02926
  globdist_provcapital  .26651  -.09799        0  -.11276   .04917   .12461   .09451
globdist_stpetersburg  .09913  -.05651  -1.6429   .21998  -.16093   .02089  -.30997
```

Table B.3.43.: Matching Results for Okhrana Coarsening: Expanded Set of Covariates

```
Matching Summary:
-----------------
Number of strata: 363
Number of matched strata: 23
              0    1
       All  199  250
   Matched   31   34
 Unmatched  168  216

Multivariate L1 distance: .70588235

Univariate imbalance:
                         L1     mean      min      25%      50%      75%      max
            latitude  .04412  -.08869  -1.1361   .14542  -.29976   .27181   -.5508
           longitude  .16667  -.22189   .29229  -.54255   -.6772   .05348  -.05045
           coal_terr  1.9e-16  -2.2e-16        0        0        0        0        0
          podzol_soil  1.1e-16  -.00136        0        0   -.0339   .00433   .06122
   distance_coastline  .05882   .02321  -.07519     .471  -.54734   .45829   .54349
            length_gs  .13235      1.9   6.2112     4.07   6.5615   1.1607   .85654
  globdist_provcapital  .32353   -.1936  -.42888  -.60803  -.01616   .05271  -.06968
globdist_stpetersburg  .02941   .09419   .45959  -.05049   .14607  -.22877   1.2239
```

C | Appendix to Chapter 3

C.1. Proof of Proposition 1

Consider a scenario with initial traits $\phi_i(t)$, socialization incentives σ_{ii}, the effectiveness of indoctrination ψ, and traits within the rest of society $\phi_{Ni}^d(t)$. I define a function $f: \mathbb{R} \mapsto \mathbb{R}$ as $f(x) = v_i((\sigma_{ii} - \psi)x + (1 - \sigma_{ii} - \psi)\phi_{Ni}^d(t))$, which evaluates the inter-generational utility of a parent at each displayed trait. I also have $\psi_{ii} = (\sigma_{ii} - \psi) \geq 0$ such that $f(x) = v_i(\psi_{ii}x + (1 - \psi_{ii})\phi_{Ni}^d(t))$.

Assuming that both the intergenerational and own utility components are strictly concave, I can rewrite the maximization problem of an adult as $\max_{x \in \mathcal{J}} u_i(x) + f(x)$, where $\mathcal{J}$ is the set of feasible traits. The second derivative of $f(x)$ is $f''(x) = v''(\psi_{ii}x + (1 - \psi_{ii})\phi_{Ni}^d(t))\psi_{ii}^2$. As $u_i''(x) + f'' < 0$ for all $x \in \mathcal{J}$, the maximization delivers a unique solution, x^*, since a continuous and strictly concave function over a compact set is maximized at a unique point.

Proof of part (i)

To prove Part (i) of Proposition 1, consider the following cases:

(i) When $\psi_{ii} = 0$, the function $f(x)$ becomes a constant for all values of x, and thus the maximization problem simplifies to $\arg\max_{x \in \mathcal{J}} u_i(x)$. As $u_i(x)$ is strictly concave and continuous over the compact set $\mathcal{J}$, there exists a unique solution $x^* = \phi_i(t)$.

(ii) When $\psi_{ii} = 1$, the function $f(x)$ becomes $v_i(x)$, and maximizing $u_i(x) + f(x)$ is equivalent to maximizing $v_i(x) + u_i(x)$. As both $v_i(x)$ and $u_i(x)$ are strictly concave and continuous over $\mathcal{J}$, the maximization problem has a unique solution $x^* = \phi_i(t)$.

(iii) When $\phi_{Ni}^d(t) = \phi_i(t)$, the next generation's traits will be the same as the current generation's traits, and thus the optimal solution for an individual is to maintain their current traits, i.e., $x^* = \phi_i(t)$ maximizes both $u_i(x)$ and $f(x)$.

(iv) When $\phi_i(t) = \min \mathcal{J}$, the function $u_i(x)$ is decreasing in x and $f(x)$ is non-increasing in x. Hence, the unique maximizer of $u_i(x)$ is $\phi_i(t)$, while $f(x)$ does not affect the choice of x^*. The same argument applies when $\phi_i(t) = \max \mathcal{J}$.

In summary, the maximum of the parent's optimization problem, $\max_{x \in \mathcal{J}} u_i(x) + f(x)$, depends on the value of the parameters ψ_{ii}, $\phi_{Ni}^d(t)$, and $\phi_i(t)$, as well as the properties of the functions $u_i(x)$ and $f(x)$.

Proof of part (ii)

Assume here, that $\phi_{Ni}^d(t) > \phi_i(t)$ and that $\phi_i(t)$ is interior of a set $\mathcal{J}$, i.e. $\phi_i(t) \in \mathring{\mathcal{J}}$ and which will imply $\phi_i^{d^*}(t)(\phi_i(t), \phi_{Ni}^d(t)) < \phi_i(t)$. Using the above definition of f, I note that for $\sigma_{ii} \in (0, 1)$, that $f(x)$ is strictly decreasing for all $x \geq \phi_i(t)$. $u_i(x)$ is non-increasing such that $x > \phi_i(t)$ cannot be the optimal solution. At $x = \phi_i(t)$, $u_i'(\phi_i(t)) = 0$ and $f'(\phi_i(t)) = 0$, such that $x = \phi_i(t) - \epsilon$ should be an improvement for small enough $\epsilon = 0$. Moreover, for small enough ϵ, this is interior simply by the assumption that $\phi_i(t)$ is interior. This is analogously for $\phi_{Ni}^d(t) < \phi_i(t)$

Proof of part (iii)

Let $\psi_{ii} \in (0, 1)$ and assume $\tilde{\phi}_{Ni}^d(t) < \phi_{Ni}^d(t)$. I need to show that these assumptions imply $\phi_i^{d^*}(\phi_i(t), \tilde{\phi}_{Ni}^d(t)) > \phi_i^{d^*}$, where $\phi_i^{d^*}$ is the optimal decision of player i in deviation. To prove this, I consider three cases:

(i) Assume $\tilde{\phi}_{Ni}^d(t) \leq \phi_i(t) \leq \phi_{Ni}^d$, where at least one of the two inequalities is strict. Using Proposition 1 parts (a) and (b), I obtain $\phi_i^{d^*}(\phi_i(t), \tilde{\phi}Ni^d(t)) \geq \phi_i(t) \geq \phi_i^{d^*}(\phi_i(t), \phi Ni^d(t)))$, with strict inequalities preserved.

(ii) Assume $\tilde{\phi}^d_{Ni}(t) < \phi_i(t) \leq \phi^d_{Ni}$. Let x^* be the best response to $\phi^d_{Ni}(t)$ as the solution to the maximization problem $\max_{x \in \mathcal{J}} u_i(x) + f(x)$ as formulated earlier. Now, instead of $\phi^d_{Ni}(t)$, consider $\tilde{\phi}^d_{Ni}(t)$ and define $f \colon \mathbb{R} \mapsto \mathbb{R}$ such that $f(x) = v_i(\psi_{ii}x + (1 - \psi_{ii})\tilde{\phi}^d_{Ni}(t))$. The maximization problem is then adjusted to $\max_{x \in \mathcal{J}} u_i(x) + \tilde{f}(x)$, where $\tilde{f}(x) = f\left(x - \left[\frac{1 - \psi_{ii}}{\psi_{ii}}(\phi_{Ni}(t) - \tilde{\phi}Ni(t))\right]\right)$ is a right-shifted version of f. As $\tilde{f}'$ and f' are strictly concave for $\psi{ii} \in (0,1)$, I have $\tilde{f}'(x) > f'(x)$ for any x. Since x^* is an interior solution, it satisfies the first-order conditions $f'(x^*) = -u'_i(x^*)$, which implies $\tilde{f}'(x^*) > -u^*_i(x^*)$. Hence, $u'_i(x) + \tilde{f}'(x) > 0$, so $u_i(x) + \tilde{f}(x)$ is increasing at x^*, which yields $\tilde{x}^* > x^*$ if x^* is interior. By Proposition 1 part (c), one of the best solutions must be interior, so this case must hold.

(iii) Assume $\tilde{\phi}^d_{Ni}(t) \leq \phi_i(t) < \phi^d_{Ni}$, which is analogous to case (ii).

Furthermore, it is worth noting that if $\phi^d_{Ni}(t) < \tilde{\phi}^d_{Ni}(t)$, then exchanging the values of $\phi^d_{Ni}(t)$ and $\tilde{\phi}^d_{Ni}(t)$ results in $\tilde{x}^* < x^*$ if x^* exists. On the other hand, if $\phi^d_{Ni}(t) = \tilde{\phi}^d_{Ni}(t)$, then the unique solution to both maximization problems is $\tilde{x}^* = x^*$.

C.2. Proof of Proposition 2

The proof of Nash equilibrium requires me to apply the Perron-Frobenius theorem and its nonlinear generalization, which generates a fixed point for the matrix Ψ (Keener 1993). The theorem states that if a nontrivial matrix Ψ has nonnegative entries, then there exists an eigenvector $\mathbf{r}$ with nonnegative entries, corresponding to a positive eigenvalue λ. In addition, if the matrix Ψ is irreducible, then the eigenvector $\mathbf{r}$ is unique and simple, with strictly positive entries, and the corresponding eigenvalue is equal to the spectral radius of Ψ, i.e., the largest eigenvalue of Ψ in absolute value.

Proof of uniqueness

In this section, I need to define some terminology related to nonnegative and positive vectors. A vector with nonnegative entries is referred to as a nonnegative vector, and a vector with positive entries is referred to as a positive vector. I also introduce a partial order on the set of nonnegative vectors, where I say that $\mathbf{p}$ is greater than $\mathbf{q}$, denoted as $\mathbf{p} > \mathbf{q}$, whenever $\mathbf{p} - \mathbf{q}$ is a positive vector. Similarly, I say that $\mathbf{p}$ is greater than or equal to $\mathbf{q}$, denoted as $\mathbf{p} \geq \mathbf{q}$, whenever $\mathbf{p} - \mathbf{q}$ is nonnegative. I further define the irreducibility of a nonnegative matrix Ψ, which is said to be irreducible if its corresponding directed graph $\mathcal{G}[\Psi]$ is strongly connected, and there exists a nonnegative vector $\mathbf{r}$ such that $\mathbf{r} \geq 0$ and $\Psi\mathbf{r} > 0$.

Starting from the trait formation process $\Phi(t+1) = \Psi\Phi^d(t)$, it follows that for all $i \in N$, $\phi_i(t+1)$ is a linear function of $\phi^d_i(t)$. This implies that the intergenerational utility component $v_i(\phi_i(t+1) \mid \phi_i(t))$ is concave in $\phi^d_i(t)$, assuming the parental utility function is concave, continuous, and positive. To prove uniqueness, I define the set K as the set of all non-negative vectors with Euclidean norm one. For each vector $k \in K$, I let κ^* be the smallest positive number for which $\Psi k \leq \kappa s$ whenever $\kappa \geq \kappa^*$. Note that if s has zero entries, then κ^* may be infinite. Since K is a closed and bounded set, the smallest value of κ^* is attained for some vector $k^* \in K$. I claim that k^* is a positive eigenvector of Ψ.

Assuming $\Psi k^* \leq \kappa^* s^*$ but s^* is not an eigenvector of Ψ, I can deduce that some, but not all of the relations in $\Psi s^* \leq \kappa^* k^*$ are inequalities. Without any inequalities, the value of κ^* would be chosen incorrectly. In the case of two agents, I can rearrange the relations as:

$$\begin{aligned} \Psi_{11}k_1 + \Psi_{12}k_2 &< \kappa^* k_1 \\ \Psi_{21}k_1 + \Psi_{22}k_2 &= \kappa^* k_2 \end{aligned} \tag{1}$$

Since Ψ is irreducible, Ψ_{21} is not identically zero, allowing me to reduce at least one component of the vector k_1. This change will transform at least one of the inequalities to a strict inequality without altering any of the original strict inequalities. I then normalize the vector by rescaling it to have a norm of one. By repeatedly modifying k^* in this manner, I can ensure that all the relations in $\Psi s^* \leq \kappa^* s^*$ become strict inequalities. However, this contradicts the definition of κ^*, making it impossible.

Note that a nonnegative eigenvector $\mathbf{r}$ must have all positive entries. Thus, $\mathbf{r}$ defines a positive ranking vector consisting of components r_j indicating the strength of j's dynasty. Suppose there exist two linearly independent eigenvectors of Ψ, $\mathbf{r}_1$ and $\mathbf{r}_2$, satisfying $\Psi\mathbf{r}_1 = \lambda_1\mathbf{r}_1$ and $\Psi\mathbf{r}_2 = \lambda_2\mathbf{r}_2$, where λ_1 and λ_2 are the corresponding eigenvalues, and suppose that $\mathbf{r}_1$ has strictly positive entries. Without loss of generality, I can assume that the entries of $\mathbf{r}_2$ are all positive.

Now consider the vector $\mathbf{r}(\phi_i^d) = r_1 - \phi_i^d\mathbf{r}_2$, where ϕ_i^d is in some range $0 \leq \phi_i^d(t) \leq \phi_i^{d^*}(t)$ with $\phi_i^{d^*}(t)$, and $\mathbf{r}(\phi_i^{d^*}(t))$ has some zero entries but is not identically zero, while for $\phi_i^d > \phi_i^{d^*}(t))$, $\mathbf{r}(\phi_i^d(t))$ has some negative entries. Then, $\Psi\mathbf{r}(\phi_i^{d^*}(t)) = \lambda_1 \left(\mathbf{r}_1 - \frac{\phi_i^{d^*}(t)\lambda_2}{\lambda_1\mathbf{r}_2} \right)$ has only positive entries. By the maximality of $\phi_i^{d^*}$, it must be that $|\lambda_2| < |\lambda_1|$.

If both $\mathbf{r}_1$ and $\mathbf{r}_2$ have only positive entries, I can simply interchange them in the argument above to conclude that $|\lambda_1| < |\lambda_2|$, which is a contradiction. Therefore, the positive eigenvector is unique, and all other eigenvectors have eigenvalues that are smaller in absolute value. A minor modification of this argument shows further that the largest eigenvalue is simple. If $\mathbf{r}_2$ is a generalized eigenvector of Ψ satisfying $\Psi^k\mathbf{r}_2 = \lambda_1^k\mathbf{r}_2$ for some $k > 1$, then $\Psi^k\mathbf{r}(\phi_i^{d^*}) = \lambda_1^k\mathbf{r}(\phi_i^{d^*})$ is strictly positive, contradicting the definition of $\phi_i^{d^*}$.

Proof of a fixed point

A positive fixed point of a mapping v of a finite-dimensional space to itself can be proven to exist by assuming that v is a positive, monotone, and strictly concave function. The function satisfies $v_i(\mathbf{r}) > 0$ for all $\mathbf{r} > 0$, $v_i(\mathbf{p}) > (\geq)v_i(\mathbf{q})$ whenever $\mathbf{p} > (\geq)\mathbf{q}$, and $v_i(\phi_i^d\mathbf{r}) > \phi_i^dv_i(\mathbf{r})$ for $0 < \phi_i^d < 1$. I seek a positive eigenvector of the nonlinear eigenvector problem $v_i(\mathbf{r}) = \mathbf{r}$, which is viewed as a nonlinear generalization of the Perron-Frobenius.

To show that at least one positive fixed point exists, I consider the vector $\mathbf{r}_0$ with all entries equal to 1. Notice that $v_i(\mathbf{r}_0) < 1$. I define the sequence of vectors $\mathbf{r}_k$ by successive approximation $\mathbf{r}_k = v_i(\mathbf{r}_{k-1})$. I further observe that $\mathbf{r}_k < \mathbf{r}_{k-1}$. The monotone decreasing sequence of vectors $\{\mathbf{r}_k\}$ is then bounded below by $v_i(\mathbf{0}) > \mathbf{0}$, and hence converges to some positive vector $\mathbf{r}$. As v_i is continuous, $\mathbf{r}$ is a fixed point of v_i. The positive fixed point $\mathbf{r}$ is unique.

If there were more than one positive fixed point, there would exist a positive vector $\mathbf{q}$ satisfying $v_i(\mathbf{q}) = \mathbf{q}$. Suppose, without loss of generality, that $\mathbf{q} \leq \mathbf{r}$ does not hold. Then, there is a maximal $\phi_i^{d^*}$ with $0 < \phi_i^{d^*} < 1$ such that $\phi_i^d\mathbf{q} \leq \mathbf{r}$ for all ϕ_i^d in $0 \leq \phi_i^d \leq \phi_i^{d^*}$. Therefore,

$$\mathbf{r} = v_i(\mathbf{r}) \geq v_i(\phi_i^{d^*}\mathbf{q}) > \phi_i^{d^*}v_i(\mathbf{q}) = \phi_i^{d^*}\mathbf{q} \tag{2}$$

This contradicts the maximality of $\phi_i^{d^*}$. Thus, I can conclude that a fixed point exists, and a Nash equilibrium follows since $\phi_i^{d^*}$ is a fixed point. Note that the convexity of each utility component, which is assumed in Assumption 2, is crucial for the logic of this argument.

To summarize, assuming that the optimization problem of all parents yields a concave and continuous target function, and that the displayed trait choice set is compact and convex, I can conclude that a set of displayed traits as best responses exists for any parent. The convex-valuedness assumption is indispensable, as there could be cases in which no such fixed point exists (Mas-Colell et al. 1995, p. 953).□

C.3. Proof of Proposition 3

Propostion 1 directly implies, that parents choose their best reply displayed trait in any steady state. Given the definition of steady states and the trait formation process $\Phi(t+1) = \Psi\Phi^d(t)$, the set of steady states is equal to the set $\{\Phi \in \mathcal{I}^n \mid \Psi\Phi = \Phi\}$. Therefore, if the traits of individuals within an essential communication class are identical, then $\Psi_L\Phi_L = \Phi_L$, where Ψ_L is the restriction of Ψ to an essential communication class L, and Φ_L is the vector of adopted traits restricted to that set. To prove that steady state traits cannot differ within an essential communication class, I will use a proof by contradiction. Let L be an essential communication class with $|L| \geq 2$ and suppose there exist $i, j \in L$ with $\phi_i \neq \phi_j$. Let $\tilde{\phi}_L := \max \phi_i \mid i \in L$ be the maximal trait in communication class L. Since L is a communication class, there exists an $i \in L\{l \in L \colon \phi_l = \tilde{\phi}_l\}$ and a $j \in L\{l \in L \colon \phi_l \neq \tilde{\phi}_l\}$, such that $\psi_{ij} > 0$.

Furthermore, due to the maximality of $\tilde{\phi}_L$ and the fact that L is essential, $\psi_{ik} = 0$ for all $k \in N$ with $\phi_k > \tilde{\phi}_L$. Therefore, if $e_i'\Psi\Phi_L \neq \phi_i$, where e_i denotes the i-th unit vector, then this cannot be a steady state. This completes the proof that steady state traits cannot differ within an essential communication class. Assume, that there exists an inessential communication class $L' \in \mathcal{P}(\Psi)$ with connections to other dynasties $J := j \in N \mid i \to j, i \in L'$ such that

the set of traits $\Phi_{L'}$ is not included in the convex hull of the set $\phi_j \mid j \in J$. Without loss of generality, we can assume that $\tilde{\phi}_{L'} := \max\{\phi_i \mid i \in L'\} > \max\{\phi_j \mid j \in J\}$.

Since L' is an inessential communication class and all connections to outside dynasties are with traits strictly less than $\tilde{\phi}L'$, there exists a player k with $\phi_k = \tilde{\phi}L'$ and a j with $\phi_j < \tilde{\phi}L'$ such that $\psi kj > 0$. By the maximality of $\tilde{\phi}L'$ and all other connections being to dynasties with traits strictly less than $\tilde{\phi}L'$, I can conclude that $e'_k \Psi \Phi_{L'} \neq \phi_k$. Therefore, this configuration cannot be a steady state. Thus, I can conclude that all traits of the dynasties in inessential communication classes $L' \in \mathcal{P}(\Psi)$ are convex combinations of the traits of the essential communication classes $L \in \mathcal{P}(\Psi)$ such that $J \cap L \neq \emptyset$.

C.4. Proof of Proposition 4

Proposition 4 is proven using the Gershgorin Disc Theorem, which states that for any square substochastic matrix A, $\rho(A) \leq 1$. This was shown in Horn and Johnson (2012, p. 388). If A is stochastic, then $\rho(A) = 1$ since A has an eigenvector of ones, $\mathbb{1} \overset{\Delta}{=} (1, \dots, 1)^\top : \Psi\mathbb{1} = \mathbb{1}$. Therefore, the following lemma proves Proposition 4:

Lemma 1 (Convergence) *Let A be a square matrix with complex and real entries. Then, the sequence $A^t_{t \to \infty}$ converges if and only if the following conditions are satisfied:*

(i) If λ is an eigenvalue of A, then either $\lambda = 1$ or λ lies in the open unit circle as per the Gershgorin Disc Theorem.

(ii) If 1 is an eigenvalue of A, then its algebraic multiplicity equals its geometric multiplicity, as shown in Horn and Johnson (2012, p. 181).

We denote the set of eigenvalues of matrix A by $\Lambda(A)$, and let $\lambda(A) \in \Lambda(A)$. If z is a complex number, then we denote by $\mathfrak{R}(z)$ the real part and by $=(z)$ the imaginary part of z.

Now I show that the first condition of the above lemma is satisfied for symmetric positive definite matrices Ψ. That is:

$$M := \Psi(I + \Pi\Psi)^{-1}(I + \Pi) = (\Pi + \Psi^{-1})^{-1}(I + \Pi) \tag{3}$$

Note that by definition, $M = \Psi(I + \Pi\Psi)^{-1}(I + \Pi) = (\Pi + \Psi^{-1})^{-1}(I + \Pi)$. This will be well-defined if Ψ is positive definite. If it is, then M is invertible and $M^{-1} = (I + \Pi)^{-1}(\Pi + \Psi^{-1})$. Let $\tilde{\Pi}$ be the diagonal matrix defined by $\tilde{\pi}_{ii} = \frac{1}{1 + (\sigma_{ii} - \psi)(\beta_{ii} - \pi)}$ for all $i \in 1, \dots, n$. Then, $\tilde{\pi}_{ii} \in (0, 1)$ for all i, and $\tilde{\Pi}\Pi = I - \tilde{\Pi}$. We have:

$$M^{-1} = \tilde{\Pi}(\Pi + \Psi^{-1}) = I - \tilde{\Pi} + \tilde{\Pi}\Psi^{-1} = I + \tilde{\Pi}(\Psi^{-1} - I) \tag{4}$$

Since Ψ is symmetric positive definite, so is its inverse Ψ^{-1} and $(\Psi^{-1} - I)$. Hence, the eigenvalues of these matrices are real and positive. Furthermore, consider the matrices $\tilde{\Pi}(\Psi^{-1} - I) = \tilde{\Pi}^{\frac{1}{2}}[\tilde{\Pi}^{\frac{1}{2}}(\Psi - I)]$ and $\tilde{\Pi}^{\frac{1}{2}}(\Psi^{-1} - I)\tilde{\Pi}^{\frac{1}{2}}$. These matrices share the same eigenvalues as any $n \times n$ matrices A and B, where the eigenvalues of their product AB are the same as the eigenvalues of BA. Here, $\tilde{\Pi}^{\frac{1}{2}}$ represents a diagonal matrix with entries $(\tilde{\Pi}^{\frac{1}{2}})_{ii} = \sqrt{\tilde{\pi}_{ii}}$. Moreover, the matrix $\tilde{\Pi}^{\frac{1}{2}}(\Psi^{-1} - I)\tilde{\Pi}^{\frac{1}{2}}$ is symmetric and positive definite, which implies that it has only real and positive eigenvalues. As a result, both M and its inverse M^{-1} have real and positive eigenvalues.

In addition, since Ψ is a row-stochastic matrix, it follows that $|\lambda(\Psi)| \leq 1$, which implies $\lambda(\Psi^{-1}) \geq 1$. Therefore, subtracting I from Ψ^{-1} reduces the eigenvalues by 1, i.e., $\lambda(\Psi^{-1} - I) \geq 0$. From the previous result, I know that $\lambda(\tilde{\Pi}(\Psi^{-1} - I)) \geq 0$, which implies that $\lambda(I + \tilde{\Pi}(\Psi^{-1} - I)) \geq 1$. Consequently, $\lambda(M^{-1}) \geq 1$, and hence all eigenvalues of M are real and lie within the interval (0,1]. Furthermore, because M has a row sum of 1, at least one eigenvalue must be equal to 1. This is due to the definition of row-stochasticity and the Gershgorin Disc Theorem, as proved in Horn and Johnson 2012, p. 391, which implies that the spectral radius is bounded by $\rho(M) \leq 1$ for any square substochastic matrix M. If M is stochastic, then $\rho(M) = 1$, as M has an eigenvector of ones $\mathbb{1} \overset{\Delta}{=} (1, \dots, 1)' : M\mathbb{1} = \mathbb{1}$. It is important to note that the number of eigenvalues equal to 1 and their associated linearly independent eigenvectors equals the number of essential communication classes, as outlined in the convergence section. Hence, this satisfies condition (ii) of the lemma mentioned above.

According to the Perron-Frobenius theorem, the spectral radius $\rho(M) \geq 0$ of a nonnegative matrix M is an eigenvalue of M for which a real nonnegative eigenvector exists. Moreover, if M is irreducible, then $\rho(M)$ is a simple

eigenvalue and is positive. The Perron-Frobenius Theorem is also applicable to the transposed matrix M', and thus M has a left nonnegative eigenvector w', such that $w'M = \rho(M)w'$. In addition to $\rho(M)$, a nonnegative matrix may have other eigenvalues λ with $|\lambda| = \rho(M)$. If λ is an eigenvalue of a nonnegative matrix M with $|\lambda| = \rho(M)$, then the algebraic and geometric multiplicities of λ coincide (i.e., all Jordan blocks corresponding to λ are trivial). Therefore, M^t converges, i.e., $M^\infty := \lim_{t\to\infty} M^t$ exists, and since 1 is an eigenvalue of M, $M^\infty \neq \mathbf{0}$. It is easy to see that $\Phi(\infty) := M^\infty \Phi(0)$ is a steady state, as $M\Phi(\infty) = MM^\infty \Phi(0) = \Phi(0) = \Phi(\infty)$.

C.5. Proof of Proposition 5

As by the lemma posed above for Proposition 4, convergence of a power matrix M is guaranteed if M has exactly one eigenvalue of 1 and all other eigenvalues are in the interval $(-1, 1)$. The proof relies on the Perron-Frobenius theorem, which states that for a row stochastic matrix Ψ with irreducible and strictly positive diagonal elements, there exists a simple eigenvalue of 1 and all other eigenvalues are in the interval $(-1, 1)$. I consider the matrix $M = \Psi(I + \Pi\Psi)^{-1}(I + \Pi)$ and need to ensure that $(I + \Pi\Psi)$ is invertible for M to exist. To guarantee this, I require that $1 + (\beta_i - \pi)(\psi_{ii} - \sum_{j\in Ni} \psi_{ij}) > 0$ holds for every $i \in N$, where π is the sum of diagonal elements of Ψ. As Ψ has strictly positive diagonal elements, this condition is always satisfied if $\pi \leq 1$. By the continuity of eigenvalues, we can ensure that there exists a non-empty neighborhood $N(\mathbf{0} \mid \Psi) \subset \mathbb{R}_+^n$ where both $(I + \Pi\Psi)$ is strictly diagonally dominant and M has exactly one eigenvalue equal to 1 and $n-1$ eigenvalues in the interval (-1,1). Therefore, M^t converges.$\square$

C.6. Proof of Proposition 6

In regards to the convergence of Ψ^t and M^t, it is straightforwardly implied that Ψ^t converges as Ψ is positive definite and row-stochastic. Additionally, Proposition 4 has already established the convergence of M^t for $t \to \infty$. Therefore, my objective now is to prove that M^t converges slower for $t \to \infty$ compared to Ψ^t, which I can accomplish by demonstrating that all eigenvalues of M are real and $\lambda_k(\Psi) < \lambda_k(M)$ for all $2 \leq k \leq K$. Since $M^{-1} = \tilde{\Pi}(\Pi + \Psi^{-1})$ where $\tilde{\Pi}$ is a diagonal matrix with entries $0 < \tilde{\Pi} = \frac{1}{1+\pi_{ii}} < 1$ for all $(\beta_i - \pi) > 0$, I can express $\lambda_k(M^{-1})$ as $1 + \lambda_k(\tilde{\Pi}(\Psi^{-1} - I))$. It follows that $\lambda_k(\tilde{\Pi}^{\frac{1}{2}}(\Psi^{-1} - I)\tilde{\Pi}^{\frac{1}{2}})$ can be substituted for $\lambda_k(\tilde{\Pi}(\Psi^{-1} - I))$.

Additionally, I can leverage the Theorem of Ostrowski, as described in Horn and Johnson (2012, p. 413), to show that $(\Psi^{-1} - I)$ and $(\Pi^{\frac{1}{2}}(\Psi^{-1} - I)B^{\frac{1}{2}})$ are symmetric and positive definite. Using this theorem, I can express $\lambda_k(\tilde{\Pi}^{\frac{1}{2}}(\Psi^{-1} - I)\tilde{\Pi}^{\frac{1}{2}})$ as $\theta_k\lambda_k(\tilde{\Pi}^{\frac{1}{2}}(\Psi^{-1} - I)\tilde{\Pi}^{\frac{1}{2}})$, where θ_k is a real number that satisfies $\lambda_k(\tilde{\Pi}^{\frac{1}{2}}\tilde{\Pi}^{\frac{1}{2}}) \leq \theta_k \leq \lambda_1(\tilde{\Pi}^{\frac{1}{2}}\tilde{\Pi}^{\frac{1}{2}})$. Since $\tilde{\Pi}^{\frac{1}{2}}\tilde{\Pi}^{\frac{1}{2}} = \tilde{\Pi}$ is a diagonal matrix with entries $0 < \tilde{\Pi} = \frac{1}{1+\pi_{ii}} < 1$, it follows that $\lambda_k(\tilde{\Pi}^{\frac{1}{2}}(\Psi^{-1} - I)\tilde{\Pi}^{\frac{1}{2}}) < \lambda_k(\Psi^{-1} - I)$ for all k such that $\lambda_k(\Psi^{-1} - I) > 0$. This condition holds for $\lambda_k(\Psi) < 1$, which is true for all $\lambda_k(\Psi)$ such that $2 \leq k \leq K$.

Therefore, I can write $\lambda_k(M^{-1}) = 1 + \lambda_k(\tilde{\Pi}(\Psi^{-1} - I)) < 1 + \lambda_k(\Psi^{-1} - I) = 1 + \lambda_k(\Psi1^{-1}) - 1 = \lambda_k(\Psi^{-1})$. Consequently, $\lambda_k(M^{-1}) < \lambda_k(\Psi^{-1})$, and it follows that $\lambda_k(M^1) < \lambda_k(\Psi^1)$ for all $2 \leq k \leq K$. This proves that the convergence of M^t is slower than that of Ψ^t.$\square$

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