Diffusion of Gender Norms: Evidence from Stalin's Ethnic Deportations*

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Abstract

We study horizontal between-group cultural transmission using a unique historical experiment. During WWII, Stalin deported over 2 million people—mostly Germans and Chechens—to Siberia and Central Asia solely based on their ethnicity. As a result, the native population of the deportation destinations was exogenously exposed to groups with drastically different gender norms and behavior. We combine historical archival data with contemporary census, survey, and enterprise data to document that: first, there are no systematic differences in female labor force participation and education among deportation locations prior to deportations. Second, gender equality in contemporary labor force participation, leadership in business, and fertility is higher in deportation destinations with a larger presence of Protestant compared to Muslim deportees. Contemporary attitudes toward the role of women among native groups and education follow the same pattern. These effects cannot be fully explained either by vertical cultural transmission as they hold for the native groups in the deportation locations, or by differential economic conditions, which do not vary enough with the group composition of deportees. Instead, the evidence strongly suggests that gender norms diffused horizontally from deportees to the local population, affecting attitudes and behavior.

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1 Introduction

Social scientists agree that culture is an important driver of human behavior (Richerson and Boyd, 2006; Spolaore and Wacziarg, 2013; Alesina and Giuliano, 2015). Cultural traits can be transferred both "vertically" across generations within families and "horizontally" across groups (Richerson and Boyd, 2006; Bisin and Verdier, 2010). A large body of empirical research in economics documents cultural persistence (e.g., Bisin and Verdier, 2010) and cultural barriers to social learning (e.g., Spolaore and Wacziarg, 2009) pointing to vertical transmission. There is also vast anthropological evidence on the horizontal transmission of culture (Henrich, 2017). Systematic empirical evidence of between-group cultural transmission is recent and still scarce. Several contributions document that, in some contexts, people embrace new alien cultures (Clingingsmith, Khwaja and Kremer, 2009; Tuccio and Wahba, 2018; Giuliano and Tabellini, 2020), whereas in other contexts, reject them and increase identification with their own culture (Grosfeld, Rodnyansky and Zhuravskaya, 2013; Sakalli, 2018).

To ensure exogenous variation in exposure, well-identified studies of interactions between different groups use experimental settings, in which people of different cultural backgrounds are randomly assigned to the same locations. The literature studied the random allocation of children to classes, students to dorms, migrants to social housing, and soldiers to regiments.[1] Such experiments often involve explicit incentives to cooperate (e.g., common tasks assigned to army regiments) or selection into the experiment based on a common goal (e.g., Hajj participation as in Clingingsmith, Khwaja and Kremer, 2009). In many real settings, however, people choose freely whether to interact with members of other ethnic groups; and groups often have conflicting objectives.

We use Stalin's ethnic deportations during WWII to document the diffusion of gender norms across different ethnic groups: from deportees to the native population in deportation locations. This historical experiment represents an ideal setting for studying horizontal cultural transmission. (i) Gender norms differed sharply across deported groups. (ii) The variation in the exposure of the local population to different deportee groups across different destinations was quasi-exogenous. (iii) Deportations were indiscriminate, leaving no room for the selection of deportees. (iv) There were no special conditions created for cooperation between natives and deportees. (v) The vast majority of deportees and their descendants left the deportation locations before the long-run outcomes were measured.

[1] Most of these studies focus on testing the contact hypothesis (Allport, 1954) by examining the effect of group exposure on inter-group prejudice and discrimination (Boisjoly et al., 2006; Carrell, Hoekstra and West, 2015; Finseraas and Kotsadam, 2017; Scacco and Warren, 2018; Burns, Corno and Ferrara, 2019; Rao, 2019). Some test how diversity affects the provision of a common good (e.g., Algan, Hémet and Laitin, 2016). Only few, such as Burns, Corno and Ferrara (2019) and Rao (2019), also find imitation of behavior across groups.

Over 2 million people, the vast majority of whom comprised of the entire German and Chechen populations of the USSR, were deported from the western to the eastern parts of the Soviet Union during WWII under the suspicion of collaboration with the Nazis against Soviets. Unlike Gulag prisoners, deportees were not confined to camps and were not guarded; instead, they were free to interact with the local population. At deportation destinations, they typically were instructed to find accommodation among the locals and send their children to the same schools. Deportees worked in the same places as the native population; they, however, were restricted to blue-collar occupations, irrespective of their skills. Deportees were not allowed to leave destination localities for several decades, but the vast majority left before or at the time of the dissolution of the Soviet Union.

Deportee groups differed along many dimensions, such as traditional religion, education, place of origin, and gender norms. We focus on one dimension of these differences: gender norms and use traditional religion to proxy for it. Groups of deportees who traditionally identified themselves as Protestant had more equitable gender norms compared to deportees who traditionally were Sunni Muslims.[2]

Deportation destinations were scattered across Eastern Siberia and Central Asia. The native population of deportation destinations in Siberia was predominantly ethnic Russian, who at the beginning of WWII had more equitable gender norms than the Muslim population of the USSR, but did not have as long a tradition of gender equality as deported ethnic Germans. In Central Asia, the majority of the native population practiced Islam and their gender norms were also traditional or, at times, less equitable than those of Muslim deportees. Polygyny, veils for women, female illiteracy, and child marriages were widespread among Central Asians (Northrop, 2004). Only some of these norms were common among Muslim deportee groups.

We test whether gender norms transferred horizontally from deportees to the local native population. In particular, we study how gender-related behavior of natives depends on the group composition of deportees at the destination localities. The way destination localities are determined allows us to overcome potential endogeneity problems by conditioning on subnational-region fixed effects and restricting the sample to the deportation destinations. Central authorities determined the quotas of each deportee group in every subnational region, possibly taking into account factors correlated with the cultural traits of the native population. In contrast, within regions, the allocation of deportees across localities was unrelated to their culture or the culture of natives. Within regions, the local population was fairly homogeneous. The assign-

[2]Henceforth, we refer to Sunni Muslims as Muslims because the number of Shia deportees was negligible: only 0.2% of all ethnic deportees were Shia Muslim. Whether we control for their presence together with other non-Protestant and non-Muslim deportees or include them in the group of Muslim deportees makes no difference for any of the results.

ment of deportees to a particular locality within a region was driven by local needs for manual labor—the main occupation of ethnic deportees at their destinations—and was orthogonal to the skills, ethnic identity, and culture of deportees.

We combine multiple historical and contemporary data sources for our analysis. Data on the number of deportees of each ethnicity at each destination location come from the 1951 census of all deportees conducted by the Soviet secret police (NKVD) available in the Russian national archives. As the main outcome variables, we use gender-specific labor force participation and higher educational attainment of deportation-destination residents and gender composition of boards of companies located in deportation destinations. Individual data come from the 2010 Russian population census and firm data are from the Orbis database for Russia, Kazakhstan, Kyrgyzstan, Uzbekistan, Tajikistan, and Turkmenistan. To describe the native population of localities prior to deportations, we use data from the 1897 Russian Empire and 1939 Soviet population censuses. We also collected a number of geographical and other historical characteristics of deportation destinations. To study the mechanism behind our main results, we also use attitudinal questions on gender roles and gender-specific behavior from the 2016 wave of the Life in Transition Survey (LiTS) in five countries that received ethnic deportees: Russia, Kazakhstan, Kyrgyzstan, Uzbekistan, and Tajikistan. This dataset has an important advantage, it reports the ethnic identity of respondents.

First, we show that there were no systematic differences in the main outcomes of interest between those localities that subsequently became the destinations of Protestant and of Muslim ethnic deportations. We find that locality-level female labor force participation and female literacy rate measured in the 1897 census were unrelated to the local group composition of deportees before the deportees arrived. We also document the balance across deportation destinations with different deportee group composition for a large list of observables, such as ethnic and religious composition of the natives, locality size, population density, and economic, social, and geographical characteristics.

Second, we examine the effect of deportees on contemporary outcomes. Female labor force participation (FLFP), and the presence and share of females on company boards are significantly higher today in localities with a larger number and share of Protestant deportees, while female fertility is significantly lower. In contrast, contemporary male labor force participation (MLFP) and male fertility are unrelated to the group composition of deportees. These findings are robust to controlling for a large set of potential confounds and are unlikely to be driven by unobserved heterogeneity as suggested by the results of the Oster (2019) test. In addition, we show that the effect is larger when deportees constituted a larger share of the local population. We also find that higher-educational attainment among women is positively related to the share of Protestant deportees and that this effect is present only for those cohorts that

were young enough to be at school after the deportees arrived, and not for the older cohorts. In contrast to many gender-specific effects, higher educational attainment is significantly higher for both men and women at destinations of Protestant deportees, who were more educated than other deportee groups.

To understand what explains contemporary differences in outcomes across deportation locations, we first show that they are not driven by the presence of deportees or their descendants. The vast majority of deportee families left after they were allowed, which happened well before the long-run outcomes were measured. Yet, a few descendants of deportees stayed. Thus, theoretically our results could be driven by the behavior of the descendants of deportees. We show that this is not the case. We use 2010 census data on ethnic composition available at the regional level and data on local group composition of deportees from 1951 to predict the number of remaining descendants from each deportee group.[3] Then, we make an extreme assumption that all females who belong to Protestant deportee groups work and all females who belong to Muslim deportee groups do not work and eliminate at random observations from the sample that satisfy the criteria for being a descendant of Protestant or Muslim deportees. Despite the fact that, by design, we delete those observations that fit the estimated relationship perfectly, in the reduced sample, FLFP is still positively associated with the number and the share of Protestant deportees, suggesting that deportee descendants could not drive the result.

The Orbis firm data provide full names of company directors. We predict who among them belong to the deported ethnic groups by matching directors' names with data from the historical and human rights NGO Memorial on individual names of almost all ethnic deportees from the largest deported groups. Then, we recalculate the measures of female leadership in firms using only directors who do not belong to deported ethnicities. The results remain practically unchanged, also suggesting that contemporary presence of representatives of deported ethnicities could not drive the result.

Finally, we use the 2016 LiTS survey, which contains the information about the ethnicity of respondent, and show the robustness of the results to considering only local native ethnic groups. We also show that pro-gender-equality attitudes about the role of women in society and in the family of the local natives are predicted by the group composition of the deportees. We conclude that the results cannot be explained purely by the vertical transmission of deportee norms to their descendants.

Using LiTS, we also document that the results are not driven by selective in-migration of the local population, as they are robust to restricting the sample to re-

[3]Census data do not make individual-level information about the names or ethnicity of respondents available to researchers. Ethnic composition at the municipality level is also unavailable.

spondents whose families lived before WWII in the same region as the respondents. In addition, the decision of natives to migrate out of the deportation regions was not related to the differences in gender norms between the locals and the deportees, suggesting that selective outmigration of the local population is unlikely to drive the results.

We explore the mechanisms further using remote-sensing nighttime light density data, Orbis's firms data, and administrative data on Russia's municipalities. We show that the level of development and productivity could not explain the main effect; neither could the differential development of certain industries, which are particularly conducive to female employment, with the exception of service sector which is slightly higher at destinations of Protestant deportees compared to destinations of Muslim deportees. There is some, although weak, evidence that differential educational inputs, such as the availability of schools or public expenditure on education, is higher in localities which were the destinations of Protestant, but not Muslim deportees. However, these effects are too small in magnitude and significance for the transformation of the local environment by deportees to be the main proximate mechanism behind the effects on gender norms. We do find evidence of larger effects when groups are culturally closer and when adopting the norms of the other group is less costly. All pieces of evidence taken together strongly suggest the presence of between-group cultural transmission of gender norms: the native population of the deportation destinations have adopted more equitable gender attitudes and behavior in places with larger exposure to Protestant deportees through imitation and learning.

Figure 1 illustrates the main pattern in the data for FLFP, presence of female directors in firms, and pro-gender-equality attitudes. It presents the mean difference between these outcomes in deportation destinations and their respective region, grouping deportation destinations by the tercile of the local share of Protestants among deportees. The figure shows that FLFP, female leadership in firms, and pro-gender-equality attitudes of the population are below the regional averages in localities with the lowest share of Protestants among deportees and are above the regional averages in localities with the highest share of Protestants among deportees.

The magnitude of the main effects is not negligible: A one standard deviation increase in the share of Protestant deportees at an average deportation destination leads to an increase in FLFP by 0.8 percentage points or 1 percent from the mean and to a one-percentage-point increase in the probability that an average firm in this locality has a female director, equivalent to a 3.4% increase from its mean, and a 0.8-percentage-point increase in the share of female directors (3.2% increase from the mean). It also leads to a 5.3-percentage-point increase in the probability that an average citizen disagrees with statements in favor of traditional gender norms and

against gender equality (29% increase from its mean).

By providing evidence on the between-group diffusion of gender norms, our paper contributes to the literature on cultural transmission (Clingingsmith, Khwaja and Kremer, 2009; Bisin and Verdier, 2010; Spolaore and Wacziarg, 2013; Alesina and Giuliano, 2015; Tuccio and Wahba, 2018; Giuliano and Tabellini, 2020). We also contribute to the literature on the determinants of gender roles, see Goldin (1990), Giuliano (2017), and Giuliano (forthcoming) for excellent reviews of this literature.[4] In particular, our work is related to papers documenting peer effects in gender norms. Schmitz and Weinhardt (2019) and Boelmann, Raute and Schoenberg (2020), for instance, show that West Germans exposed to East Germans exhibit more equitable gender norms and higher rates of maternal labor supply and interpret the results as evidence of cultural transmission from East Germans to West Germans. Our paper focuses on horizontal transmission of gender norms across ethnic boundaries (rather than within a single ethnicity) and uses forced rather than voluntary migration for identification.[5]

The paper proceeds as follows. In Section 2, we provide historical background about the determinants of destinations of ethnic deportations and differences in gender norms among deportee groups and between deportees and the local population at the destination locations. Section 3 presents data sources. In Section 4, we describe empirical strategy and discuss the main identification assumptions. Section 5 reports the main results. In Section 6, we show that vertical transmission of cultural norms from deportees to their descendants is insufficient explain the results. Section 7 sheds some light on the mechanisms of diffusion of gender norms from deportees to local population. Section 8 concludes.

2 Historical Background

2.1 Ethnic deportations during WWII

Deportees and life at destination.—Ethnic deportations were decided by decrees issued by Soviet authorities. The official goal of the ethnic deportations was the purge of "anti-Soviet, alien, and suspicious elements" as stated by Lavrentiy Beria, the head of NKVD at that time (Polian, 2004, p. 139).[6] The deportees constituted a new category

[4] Fernández, Fogli and Olivetti (2004); Becker and Woessmann (2008); Fernández and Fogli (2009); Fogli and Veldkamp (2011); Alesina, Giuliano and Nunn (2013); Giavazzi, Schiantarelli and Serafinelli (2013); Fernández (2013); Hiller (2014); Giuliano (2017); Campa and Serafinelli (2018); Lippmann, Georgieff and Senik (2020) are among particularly important contributions.

[5] Other important contributions include, e.g., Maurin and Moschion (2009); Anelli and Peri (2017); Nicoletti, Salvanes and Tominey (2018); Olivetti, Patacchini and Zenou (2020). We also contribute to the literature on the consequences of Stalin's punitive policies surveyed in Zhuravskaya, Guriev and Markevich (forthcoming), such as Toews and Vezina (2019); Becker et al. (2020).

[6] A historian of ethnic deportations, J. Otto Pohl, describes the purpose of the deportations as follows: *"it [the deportation] sought to use the deportees as a caste of helot labourers to provide a*

of Soviet subjects, so-called Special Settlers (*spetsposelentsy*), who had a status "somewhere between being a citizen and a prisoner" (Blum, 2015). They were not allowed to leave from the assigned settlement. Attempts to flee were severely punished (Zemskov, 2003; Westren, 2012). In sharp contrast to Gulag prisoners, deportees were not guarded and were not put behind bars. They were free to move in the vicinity of their assigned settlements and could interact freely with the local population. Deportees were given work usually on the same sites as the local population. Depending on the number of arriving deportees, they were either instructed to find accommodation to rent from the locals or to build their own (temporary) shacks. Deportee children were sent to local schools together with the children of natives. The language of instruction was of the local majority, the deportees were not allowed to set up schools in their own languages (Pohl, 2000).

Timing.—Ethnic deportations took place in three waves. In 1939-1941, several selective deportations took place from the annexed territories in Poland, the Baltics, and Romania, with the goal of suppressing local resistance against the Soviet occupation, following the Ribbentrop-Molotov Pact. The second wave took place in 1941-1942, after the Nazis and Soviets became enemies. The deportations of this wave were called "preventive," i.e., they claimed to prevent the deported groups from collaborating with the Nazis. The largest deported group during these years was the Soviet Germans (over 1 million of them were deported). The third wave took place in 1943-1944. It was so-called "retributive," i.e., it was a punishment for the actions of a few individuals from these groups who actually collaborated with the Nazis. This deportation wave included Chechens (over 450 thousand were deported), Crimean Tatars (almost 185 thousand) and Meskhetian Turks (over 75 thousand). The deportations of the second and third wave were indiscriminate, i.e., all Soviet citizens, including women and children, that belonged to these ethnic groups were deported; and few people who tried to resist were shot (Nekrich, 1978 and Polian, 2004, pp. 147, 151). Therefore, there was no selection at the origin. We focus on the effect of these indiscriminate deportations, which took place between 1941 and 1944, but control for the presence and size of other deported groups at their deportation locations.

Destinations.—For each ethnic deportation, NKVD in Moscow issued a directive listing the regions of destination (i.e., the *oblasts*, the first administrative division within Soviet Republics) together with quotas of deportees assigned to each region. Typically, deportees were transported to train stations on horse-drawn carriages or trucks and then by rail to the main train station of the destination region. The des-

captive workforce to develop the economy of Kazakhstan, Central Asia, Siberia and other remote areas of the USSR. To these ends it imposed a special legal status upon the exiles aimed at excluding them from mainstream Soviet society while at the same time integrating them into the local economy as a source of menial labour (Pohl, 1999, p. 13).

tination localities within the assigned region were decided only upon arrival to the destination region in accordance with local demand for manual labor (Koustova, 2015; Blum and Koustova, 2018*a*,*b*). The local authorities, who were primarily interested in recruiting young and healthy adults capable of carrying out manual labor, came to the main regional town to choose deportee families to work for them in their locality within the region. Families, for the most part, were left intact. Restrictions were imposed by central authorities on employing deportees in non-manual occupations (e.g., Mukhina, 2005, p. 740).

Other characteristics of deportees, unrelated to their physical strength, such as ethnicity, religion, or cultural background, did not play a role in their allocation to their final destinations within the assigned regions. The reason for this was that within regions the local native population was fairly homogeneous (as we illustrate below) and natives in different localities had similar preferences with regard to accepting different deportee groups.

Figures 2 and 3 present maps of the destinations of ethnic deportations and the size and group composition of deportees at those destinations. Table A1 in the Online Appendix presents the total number of ethnic deportees by religion, ethnic group, and Soviet Republic of destination in 1951. The figures and the table illustrate several historical facts: (i) The majority of ethnic deportees were brought to eastern Siberia and Kazakhstan. (ii) The majority of Protestant deportees were deported to Siberia, while the majority of Muslim deportees were deported to Central Asia. (iii) Despite these differences across countries, there is within-subnational-region variation in the group composition of deportees.[7]

Return.—Different groups of ethnic deportees were allowed to leave the deportation destinations at different points in time between 1956 (as a result of Khrushchev's Thaw) and 1991 (as a result of the fall of the Soviet Union). Chechens with several other less numerous deportee groups were rehabilitated during Khrushchev's Thaw with respect to their civil rights and their pre-deportation homelands were returned to them, albeit only partially (Polian, 2004, p. 197). They left their destination locations during the 1960s. In contrast, Germans, Crimean Tatars, and Meskhetian Turks, even though acquitted of the "crime" charges in 1964, were never fully "pardoned." A number of key restrictions including the mobility restriction on these deportee groups remained intact until the fall of the Soviet Union (Polian, 2004; Blum and Koustova, 2018*a*). Almost all of them left deportation locations after the disintegration of the Soviet Union.[8]

[7]After we introduce the data sources, we describe in detail how this variation translates into the variation in our data, as we rely on it in our empirical analysis.

[8]Most Germans moved to Germany because they were given German passports; Meskhetian Turks moved to Georgia, Azerbaijan, Turkey, and Russia; whereas Crimean Tatars mostly moved back to

2.2 Gender norms among deportees and the native population

At the time of ethnic deportations, there were no quantitative studies of gender norms of ethnic or religious groups. However, there is abundant anecdotal evidence from that period collected by historians as well as Soviet anthropologists.[9] The anthropological and historical evidence give rise to the following conclusions: (i) Gender norms were substantially more equitable among Protestant deportees (vast majority of whom were Soviet Germans) than among Muslim deportees. (ii) Gender norms of the local native populations at the deportation destinations, i.e., Russians in Siberia and the local native Muslim population of Central Asian Soviet Republics, were less equitable than gender norms of Protestant deportees. Gender norms of ethnic Russians were closer to those of Soviet Germans than those of Central Asians. (iii) Gender norms of Central Asians were similar to those of Muslim deportees. (iv) Gender norms of Russians were more equitable than those of Muslim deportees. (v) Gender equality was the official policy of the USSR which authorities tried to enforce with a varying degree of success. We provide details about the findings of this literature in Online Appendix B.

We also use the 1897 Russian empire census to illustrate the pre-existing differences in labor force participation and in education levels between men and women for the four largest subsequently-deported ethnic groups—Germans, Chechens, Crimean Tatars, and Meskhetian Turks—and the groups that constituted the native populations at the destinations of deportations—Central Asians (in Central Asia) and Russians (in Siberia). Figure 4 compares labor force participation (Panel A) and the rate of schooling above primary and literacy in Russian—the main imperial language—(Panel B) for these ethnic groups, separately in rural and urban areas. The figure illustrates that, in 1897, for both outcomes, Germans, on average, were the most gender equal among these groups, followed by Russians. Muslim deportee groups were as gender unequal as Central Asian local population. Germans had the lowest gender gap in literacy among the four considered groups.[10]

Overall, this evidence and the results of the historical and anthropological literature are fully consistent with well established facts in the literature on the effect of religion on education and gender norms between different religious (see Becker, Rubin and

Crimea (Polian, 2004).

[9] See contributions by Pospielovsky (1988); Miller (1987); Wiens (1997); Ro'i (2000); Deweese (2002); Polian (2004); Northrop (2004); Dietz (2005); Pohl (2008); Tishkov (2004); Khasbulatova (2007); Nanayeva (2012); Lazarev (2019).

[10] In Figure A2 in the Online Appendix, we verify that the smaller gender gap in education among Germans was not a mere function of the *level* of education (which was the highest for Germans compared to other ethnic groups in the Russian Empire). The figure shows that the gender gap, on average, did not close with the educational level across Russian empire provinces for all considered ethnicities, suggesting that it is cultural norms that explain the low gender gap in education among Germans.

Woessmann, 2021, for an excellent review of this literature).

3 Data

In this section, we describe all datasets used in the analysis and present the spatial variation in the data.

3.1 Data sources and variable definitions

Ethnic deportations.—Our main treatment variable comes from a dataset on the destinations of ethnic deportations from declassified archives in the State Archive of the Russian Federation (GARF) in Moscow (Alain Blum, v1.0). They represent a 1951 snapshot of the entire surviving deportee population at destination locations originally recorded by NKVD. The dataset contains the locations and the numbers of deportees by ethnic group. 1,131 municipalities across 59 regions hosted ethnic deportations.[11]

We cross-check the deportations data using archival information about the number of ethnic deportees at their destination in 1946, originally collected by NKVD (which we collected from the State Archive of the Russian Federation and digitized) and the 1970 Soviet census (Demoscope, 2010*b*), both available at the regional level. These reality checks reveal strong persistence in the spatial distribution of deported groups across deportation destinations over a quarter of a century. The results are presented in Figure A3 in the Online Appendix. Panel A compares the number of ethnic deportees recorded by NKVD in 1951 and 1946 by destination region. In Panel B, we compare the numbers of deportees in 1951 by destination region with the number of people who belong to the deported ethnicities in the same region according to the 1970 USSR census, excluding Chechens, the majority of whom left the deportation destinations before 1970. There is a strong positive correlation between the numbers of Protestant and Muslim deportees by region over time.

Contemporary outcomes.—We use several data sources for contemporary outcomes. Individual-level data on gender, age, labor force participation, education, and fertility come from the 10% sample of the 2010 Russia Census Microdata (Rosstat, 2010). These data cover every 10th individual (3,584,650 adults in total) in 554 municipalities with ethnic deportees in 41 regions of Russia.

Data on gender and names of company board members come from the Orbis data (Bureau van Dijk, 2019). We use data on 1,271,415 firms with addresses that we were able to geolocalize that are located in 873 municipalities with ethnic deportees in

[11]The dataset also contains information on nonethnic deportees: *kulaks* (wealthy farmers expropriated during the collectivization), "bandits," and "anti-Soviet elements," all of whom were deported before WWII (see Panel A of Figure 2 for destinations of nonethnic deportations). In our analysis, we control for these nonethnic deportations.

50 regions scattered around Russia, Kazakhstan, Kyrgyzstan, Uzbekistan, Tajikistan, and Turkmenistan. We calculate the gender composition of company boards and also use sector, employment, and revenue of Orbis firms. To determine whether company directors belong to the deported groups, we also use the list of names of ethnic deportees from the Political Repression Victims Database collected by the historical and human rights NGO Memorial (2015). The details on the procedure to determine which company directors belong to deported ethnicities are presented in Online Appendix C.

To explore the mechanisms, we also use data on individual-level gender attitudes that come from the 2016 wave of the Life in Transition Survey (LiTS) conducted by the European Bank for Reconstruction and Development in the fall of 2015 and the spring of 2016 (EBRD, 2016). This is a substantially smaller dataset, but with a richer set of questions about attitudes as well as ethnicity, and socioeconomic and demographic characteristics. To maximize variation in the data, instead of a direct match by municipality (which we employ for the 2010 census and Orbis data), we match these data to deportations by calculating whether there is any ethnic deportation at most 30 kilometers away from each Primary Sampling Unit (PSU). We end up with 3,454 respondents across 230 PSUs in 35 regions in Russia, Kazakhstan, Uzbekistan, Kyrgyzstan, and Tajikistan. Our main focus is on questions about attitudes toward gender roles in society and in the family. In particular, we measure gender attitudes using responses to three questions, in which respondents were asked if they agree with the following statements: (a) *"A woman should do most of the household chores even if the husband is unemployed."*; (b) *"It is better for everyone if the man earns the money and the woman takes care of home."*; (c) *"Men make better political leaders than women do."*. The response options were on a 4-point-Likert scale. We create dummies coding "strongly disagree" and "disagree" as 1, and "strongly agree" and "agree" as 0, so that higher values mean more equitable attitudes. We also aggregate the three dummies into a single measure by calculating their first principal component, in which all factor loadings turn out to be positive, and normalizing the resulting measure to be between 0 and 1.[12]

LiTS also provides useful information on the place of residence of respondents' ancestors before WWII, which we geolocalize. The LiTS questions on the educational attainment of the respondent's mothers, female entrepreneurship, and fertility allows us to check the robustness of the results using the 2010 census. We predict the birth year of the mother of each respondent using respondent's age and aggregate data on the average age of women at the time of birth of each of their children by women's

[12]There is another question on gender attitudes in LiTS. It does not have a clear interpretation. In Appendix C, we explain the reasons for leaving it out of the main analysis. And present results including this variable in the principal component analysis.

birth cohort in the USSR. These data come from the Human Fertility Collection (Max Planck Institute for Demographic Research, 2018).

We supplement the main outcomes with administrative data for municipal inputs in education for Russia's municipalities (CPUR, 2020) and with data on nighttime light density calculated using Visible Infrared Imaging Radiometer Suite (VIIRS) from NASA (2017). We calculate the mean value for each municipality which received ethnic deportations.

Historical variables.—We use the 1897 Russian empire census (Troynitsky, 1899) to verify our main identification assumption and show the absence of correlation between our main outcome variables—female labor force participation and female education—measured before deportations took place and the local group composition of deportees. We also use ethnic and religious composition, employment by sector, urbanization, literacy, and population density from the 1897 Russian empire census to check the pre-deportations balance with respect to the group composition of deportees. All these variables are available at the 1987 county (*uezd*) level.

We also construct proxies for the demographic characteristics of local native population at deportation destinations using the 1939 USSR census (Demoscope, 2010*a*), which gives the size and ethnic composition of the population at the 1939 municipality level. Importantly, this is a noisy proxy for local population after WWII, because the Soviet Union lost over 15% of its population during WWII. Yet, this is the best proxy available, as the first post-war census was conducted only in 1959, i.e., eighteen years after the deportation of Soviet Germans. We use 1939 population statistics both to control for the size of the local population at deportation destinations and to check the balance of pre-deportation local population composition with respect to the composition of ethnic deportees.

The locations of Gulag camps come from Memorial (2015) and the destination locations of Soviet enterprises evacuated to the east of the USSR during WWII are from Markevich and Mikhailova (2013).

Geographical variables.—We also assembled a broad set of geographic characteristics for the destinations of ethnic deportations. We use these variables for the balancing tests and as controls in regressions. The information about inland water areas and railroads comes from DIVA-GIS (2011). The data on temperature and precipitation come from Willmott and Matsuura (2001). The information on soil suitability for high and low inputs and the measure of ruggedness come from the FAO GAEZ (v3.0) dataset. We also collected data on the location of historical and present-day capital cities.

Summary statistics are presented separately for each dataset in Tables A2 to A5 of the Online Appendix. We provide additional details about these data sources in

Online Appendix Section C. In Online Appendix Section D, we describe the variation in the main treatment variables and outcome variables in all main datasets; presented evidence suggests that there is sufficient within-region variation in the data for our baseline analyses.

4 Estimation models, identification assumptions, and balancing tests

In this section, we first present the main specifications, discuss identification assumptions, and present evidence in support of these assumptions.

4.1 The main econometric specifications

We aim at estimating the effect of the exposure of the local population of deportation destinations to deportees with different gender norms. Empirically, we link gender-specific outcomes, such as female and male labor force participation, the share of female directors in firms, or gender-related attitudes, to the religious composition of these deportations, limiting the sample to the destinations of ethnic deportations. We consider the traditional religion of deportee groups, Protestant vs. Muslim, as a proxy for their pre-deportation gender norms. We control for region fixed effects, which as we discuss below, is necessary for identification, and for a variety of historical and geographical characteristics.

We estimate the following two alternative specifications on a cross-section of individuals, firms, or localities, focusing only on localities with ethnic deportations: one focuses on the effect of the numbers of deportees from Protestant and Muslim groups in the respondent's residence; another – on the effect of the share of Protestant deportees among Protestant and Muslim deportees.

The effect of the numbers of Protestant and Muslim deportees is estimated by:

$$\begin{aligned} Y_i = {} & \beta_1 \log(1 + Protestant\_Deportees_{l_i}) + \beta_2 \log(1 + Muslim\_Deportees_{l_i}) + \\ & + \sigma_1 \log(1 + Other\_Ethnic\_Deportees_{l_i}) + \sigma_1 \log(1 + Nonethnic\_Deportees_{l_i}) + \\ & + \beta_3 \log(Population\_1939_{l_i}) + \gamma' \mathbf{X_{l_i}} + \delta' \mathbf{C_i} + \mu_{r_{l_i}} + \epsilon_i, \end{aligned} \quad (1)$$

The effect of the share of Protestant deportees is estimated by:

$$\begin{aligned} Y_i = {} & \alpha_0 + \alpha_1 Protestant\_Deportee\_Share_{l_i} + \\ & + \sigma Non\_Protestant\_Non\_Muslim\_Deportee\_Share_{l_i} + \alpha_2 \log(Deportees_{l_i}) + \\ & + \alpha_3 \log(Population\_1939_{l_i}) + \gamma' \mathbf{X_{l_i}} + \delta' \mathbf{C_i} + \mu_{r_{l_i}} + \epsilon_i. \end{aligned} \quad (2)$$

i indexes individuals or firms located in locality l. All l are the destinations of ethnic deportations. $Protestant\_Deportees$ and $Muslim\_Deportees$ in Equation (1) denote

the numbers of Protestant and Muslim deportees in locality in 1951.[13]
Protestant_Deportee_Share in Equation (2) stands for the share of Protestant deportees among all deportees. 13% of ethnic deportees are from non-Protestant and non-Muslims groups; occasionally, there are also few nonethnic deportees in the same locations. As we want the comparison to be between the effects of exposure to Protestant vs. to Muslim deportees, in Equation 1, we control for the log numbers of other ethnic and of nonethnic deportees, and in Equation 2, we control for the share of other deportees and the log number of all deportees in the locality. (Thus, in Equation (2) the increase in the share of Protestant deportees is equivalent to the decrease in the share of Muslim deportees). Y stands for different outcome variables.

The main control variables necessary for identification, as we discuss below, are the subnational region fixed effects (μ_r, where r denotes the region of locality l). To compare locations where the size of the local native population was similar, we also routinely control for the log population in 1939. In addition, we control for potential locality-level confounds ($\mathbf{X}$) and individual-respondent or individual-firm characteristics ($\mathbf{C}$), which we present below.

For the baseline estimation using census and Orbis data, we cluster error term at the municipality level. When using LiTS as the source of outcome variable, to account for the matching procedure between the survey and the deportees data that may mechanically generate spatial correlation, we correct standard errors for spatial correlation within a 150km radius around the locality (Conley, 1999). As we show below, the results are robust to alternative assumptions about the variance-covariance matrix.

4.2 Identification assumptions

The main identification assumption to establish causal effects of the presence of Protestant vs. Muslim deportees in the locality on the gender norms is that, conditional on region fixed effects, the identity of deportees (e.g., their religion, ethnicity, and, as a consequence, cultural characteristics) was orthogonal to any unobserved determinants of the gender norms of the local population. This identification assumption is untestable, as it concerns unobservables. However, both the historical narrative and the balancing tests which we present below provide strong support for this assumption. In addition, we address identification challenges in three ways: (1) by presenting results for the main outcome variables before deportations, (2) by presenting event-study evidence on higher education attainment, and (3) by using techniques developed by Oster

[13]We add one before taking the log of Muslim and Protestant deportees, because some localities have only Protestant or only Muslim deportees. The inverse hyperbolic sine instead of a logarithmic transformation produces very similar results.

(2019) to show how likely it is that the variation in unobservables drives the results.

4.2.1 Historical rational behind the identification assumption

The between-region allocation of deportees to their destinations was designed by the central authorities and could have been guided by ideas of the authorities about the potential effects of mixing different ethnicities at deportation destinations. However, as historians argue, the within-region allocation of ethnic deportees across municipalities was determined by the need for manual labor at the time of arrival of each group of ethnic deportees to the main railway station of each destination region. Local administrations were looking for healthy and strong men and women, as physical labor was the main occupation of ethnic deportees at destinations.

The local population was fairly homogeneous within destination regions before the deportations. We illustrate this by decomposing the variance of pre-deportation local ethnic population shares into between-region and within-region variance. The results are presented in Online Appendix Table A6. This relative homogeneity makes it implausible that representatives of different municipalities within regions had different preferences with regard to different groups of deportees to accept into their localities. This premise is supported by the balance tests.

4.2.2 Balance tests

If, as historical narrative suggests, such characteristics of deportees as ethnicity or religion were irrelevant for the deportee distribution across localities within region, one should expect the group composition of ethnic deportees to be orthogonal to the pre-deportation characteristics of the destination locations conditional on region fixed effects. We test this prediction using a large list of observable characteristics of municipalities, which we regress one-by-one on the local share of Protestant deportees while also controlling for region fixed effects, the shares of non-Protestant and non-Muslim deportees, and the log number of deportees, i.e., as in a municipality-level analogue of Equation (2). We find no predictive power of whether deportees in different municipalities within the same region were Protestant or Muslim for the characteristics of municipalities, controlling for the total number of deportees in a municipality. Panel B of Table 1 presents no significant results for measures of gender-norms-related behavior from the 1897 Russian Empire census as placebo outcomes. Table A7 in the Online Appendix, considers a wide set of geographic, climate, population, and economic characteristics, including religious, ethnic, and sector composition, population size and density, overall literacy, the share employed in white collar jobs, urbanization from either 1939 Soviet or 1897 Russian Empire censuses, depending on data availability, temperature and precipitation by season, soil quality, proximity to a capital,

railroad, or Gulag camp, etc. There are several significant coefficients in this table, but their number is consistent with the frequency predicted by a random data generating process.

Panel A of Table 1 and Table A8 in the Online Appendix present regressions in which each of these placebo outcomes is regressed on the log numbers of Protestant and Muslim deportees conditional on region fixed effects and on the log numbers of other non-Protestant and non-Muslim deportees, analogous to Equation (1), but at the municipality-level. As shown in Table 1, the log numbers of Protestant and Muslim deportees in a municipality are uncorrelated with pre-deportation gender norms. However, in contrast to the results of the specification in shares, the log numbers of Protestant and Muslim deportees in a municipality are often significant predictors of population size, composition, and other historical and geographical characteristics as shown in Table A8. Yet, in the vast majority of these regressions, the sign of the coefficient on both Protestant and Muslim deportees is the same and the magnitude is often similar. This is not surprising as deportees, irrespective of their origin, were assigned to localities with a higher demand for manual labor, which can be correlated with many different characteristics. As we are interested in the differential effect of the exposure to Protestant vs. Muslim deportees rather than the effect of the size of deportations, to illustrate the balance, we test for the equality of the coefficients on the Protestant and Muslim deportees (as reported in Column 6 of Table A8 and the bottom row of Panel A of Table 1). The results of this test, again, confirm that the variation in the local composition of ethnic deportees is consistent with the random assignment of Protestant or Muslim deportees to different localities within a region, holding the total number of assigned deportees constant. In all of the subsequent analyses, we show that our results do not depend on whether we control for the variables that showed some imbalance.

Overall, we conclude that, conditional on subnational region fixed effects, a battery of geographical, historical, and pre-deportation population characteristics are largely balanced across deportation destinations with different group-compositions of deportees. We also conclude that we can identify only the differential effect on the log number of Protestant deportees relative to the effect of the log number of Muslim deportees. The reason for this is that only the group composition, and not the number of deportees, can be considered exogenous. In all of the subsequent analyses, we present the p-values of the tests for the equality of the coefficients on the log numbers of Protestant and Muslim deportees, when we estimate Equation (1).

5 Deportees' origin and gender norms

5.1 Pre-deportation gender norms and group composition of deportees

As mentioned above, in Table 1, we link the best available proxies for gender-norms-related behavior at destinations before the deportations to the subsequent group composition of deportees. In particular, we use 1897 Russian Empire census data on country-level FLFP overall, FLFP separately for rural and urban parts of the counties, and female literacy rate as placebo outcomes and estimate Equations (1) and (2). Panel A presents the results for effect of the log numbers of Protestant and Muslim deportees and Panel B for the effect of the share of Protestant deportees, where Muslim deportees are the comparison group. Every odd column does not include additional covariates and every even column includes basic geographical controls, for which we observed some imbalance. Irrespective of the specification, we find no relationship between the composition ethnic deportees on the number of Protestant or Muslim deportees and all pre-deportation measures of gender-norms related behavior. The estimates are precisely-estimated zeros. (Henceforth, in every table, we report the means and the standard deviations of each dependent variable in every regression.) These results confirm the historical narrative on which we base our estimation strategy.

5.2 The effect of former presence of deportees on contemporary outcomes

As the next step, we look at the effect on contemporary outcomes.

5.2.1 2010 Census data, FLFP

First, we find a strong, significant, and robust positive effect of a larger presence Protestant deportees on FLFP and no effect on MLFP. Table 2 presents the results. We use individual-level data for all adults below 60 years of age from the 10% sample drawn from the 2010 Russia census.[14] The first four columns focus on females and the last three columns – on males. The structure of the table is the same as in Table 1 and as in all subsequent main tables in the paper: Panels A and B present the results of the estimations of Equations (1) and (2), respectively. For each sample—females and males—we present regressions with different sets of controls. Columns 1 and 6, have the most parsimonious specification: the set of controls includes: (i) region fixed effects, necessary for identification; (ii) the presence of other non-Muslim and non-Protestant deportees and local deportation size (for the specification in shares), necessary for the correct interpretation of the estimated effects: Protestants vs. Muslims; and (iii) the

[14] Russian population over 60 is rarely in the labor force.

most basic controls for the size of the municipality—the second order polynomial of municipal log population and log area—and for the respondent's age, as well as its squared form. These covariates are important predictors of labor force participation (LFP) and, therefore, substantially reduce estimation noise. In Columns 2 and 7, we add log pre-deportation (1939) municipal population, household size, and dummies for 8 different family types, indicating the numbers of children and adults in the family. In Column 3, we add the baseline geographic controls, which show imbalance, and in Columns 4 and 8, an extended set of geo-controls. Column 4 also adds the municipality-level MLFP to the set of covariates in order to ensure that the results for FLFP are not driven by variation in MLFP. In Columns 5 and 9, we also include FLFP in 1897, to control for any historical differences in FLFP. The choice of controls does not affect the results: the share of Protestant deportees controlling for local deportation size and the log number of Protestant deportees but not the log number of Muslim deportees in a municipality significantly and positively affects the probability of labor force participation for women, but not for men. The differences in the magnitude of the coefficients on the number and the share of Protestant deportees for female and male LFP are highly significant with p-values below 1% (we estimate them by pooling the two samples together and adding an interaction term of the variable of interest with the male dummy). In contrast, the coefficients on the log number of Muslim deportees, albeit consistently negative, are small, insignificant and similar in magnitude between the two samples. The bottom row of Panel A tests for the equality of the coefficients on the Protestant and Muslim deportee numbers: for females, this difference is always significant, and for males, it is always insignificant.

In the bottom row of Panel B, we present Oster's δ statistic—following the methodology developed by Oster (2019) who built on Altonji, Elder and Taber (2005)—with region fixed effects kept as necessary controls. This statistic indicates whether the results are likely to be driven by variation in unobserved confounders under the assumption that observables represent unobservables.[15] The magnitude of the Oster's statistics shows that it is very unlikely that the results can be explained by variation in unobservables.

These effects are robust, but they are not large on average: a one standard deviation increase in the log number of Protestant deportees leads to a 0.7 percentage points increase in the probability that an average female resident of a deportation destination municipality is in the labor force. A one standard deviation increase in the share of Protestant deportees (which is equivalent to an increase by 33.6 percentage points)

[15] Following Oster (2019), here and everywhere, we set the value of $R^2_{\max}$, the R^2 from a hypothetical regression of the outcome on treatment and both observed and unobserved controls, to be equal to $1.3\tilde{R}^2$, where $\tilde{R}^2$ is the R^2 from each corresponding regression.

increases this probability by 0.8 percentage points. These effects are roughly equal to a one-percent increase from the mean FLFP of 74%.

A reasonable hypothesis is that the magnitude of the effect depends on the relative share of deportees in the local population. As we do not have a measure of the local population right after WWII, we rely on the local population numbers from the USSR 1939 census. The ratio of the number of deportees to the 1939 local population in the deportation locations in Russia range from close to zero to 1.7 with a median of 0.03, a mean of 0.05, a standard deviation of 0.13, and a 99th percentile of 0.34.[16] We estimate the heterogeneity of the effect of the share of Protestant deportees depending on the size of the ethnic deportation relative to the 1939 local population by adding interaction terms to Equation (2) between the share of Protestant deportees and the ratio of the number of deportees to the 1939 local population and another interaction term with the same variable squared, to account for a possible non-linear effects. We also add the deportee-population ratio to the list of covariates. The results are presented in Figure 5 in the form of a margins plot and regression output, in which we keep all covariates at their sample mean and vary only the relative share of deportees in the local population. The relationship is concave, but the effect is increasing monotonically until the ratio of deportees to the local population reaches 1.46, i.e., practically on the entire support of the distribution. A one standard deviation increase in the share of Protestant deportees increases the probability that a female resident of the deportation locality is in the labor force by 0.5 percentage points if the deportee-population ratio is at its 10th percentile and by 1.1 percentage points when this ratio is at the 90th percentile.

5.2.2 2010 Census data, auxiliary outcomes

Group composition of deportees affected other outcomes as well. The gender-specific effects of group composition on LFP documented above also apply to fertility outcomes. The first two columns of Table A9 in the Online Appendix consider as dependent variable whether a respondent has a child separately for women and men. We restrict the sample to adults below 30 years old because these respondents made their reproductive decisions after the dissolution of the Soviet Union.[17] We find that the number and the share of Protestant deportees is a negative significant predictor of whether young female adults have a child, while there is no significant effect for the number of Muslim deportees, although the point estimate is positive. In contrast, for males, all effects are much smaller in magnitude and are not statistically significant. The coefficients on

[16] Online Appendix Figure A4 presents its histogram.

[17] The reason for this restriction is that the Soviet Union had an aggressive policy to encourage fertility which reduced variation in these outcomes for older cohorts.

the number of Protestant and Muslim deportees are significantly different for women and not for men. The difference in the effect of Protestant deportees on having a child before age 30 between women and men is again statistically significant. A one standard deviation increase in the share of Protestant deportees decreases the probability that females below 30 years old have children by 0.9 percentage points from the mean of 41%, i.e., by about 2%. The fact that young females chose not to have children is consistent with having more equitable gender norms as, presumably, these women put more emphasis on their careers.[18]

In Columns 5 to 8 of Online Appendix Table A9, we also consider college-level and post-graduate-level educational attainment as outcome variables. Protestant deportees (and particularly German deportees, who constituted 96.5% of all deported Protestants) were the most educated group, not only among deportees, but also among all groups who lived in the Soviet Union before WWII. This was true with regard to both men and women. We test whether exposure to different groups of deportees affected educational attainment of current residents of deportation locations. For this analysis, we restrict the sample to adults above 30 years old to make sure that they have had enough time to finish post-graduate education. As shown in Panel A, the coefficients on the number of Protestant deportees are consistently positive, but precisely estimated only for men, while the coefficients on the number of Muslim deportees are always negative and imprecisely estimated in all four regressions. Yet, we can reject the equality of the coefficients on the numbers of Protestant and Muslim deportees for both men and women. As a consequence, we find that the share of Protestant deportees (Panel B) has a positive and significant effect on both attainment of higher education and post-graduate degree. The magnitude of these coefficients and their significance is similar for men and women suggesting that deportees had an effect not only on gender-specific norms. However, the effect on education is not what is driving gender-specific results on LFP because the baseline results are unchanged if we control for dummies for each of the 14 levels of education.[19]

Under the assumption that it is much harder to come back to school and eventually get a university degree if one's studies are interrupted by work after the completion of compulsory schooling compared to a situation in which one just continues studies

[18]We, however, do not find a differential effect of Protestant vs. Muslim deportees on the age of the first child as shown in Columns 3 and 4 of Online Appendix Table A9. The number of Protestant deportees does not have a significant effect, whereas the number of Muslim deportees has a significant negative coefficient for both men and women (indicating that respondents in municipalities with Muslim deportees chose to have children at a young age). Yet, as the coefficients on the number of Protestant deportees are also negative and imprecisely estimated, we cannot reject the equality of the effects of the past presence of deportees regardless of their origin, as can be seen from p-values reported in the bottom row of Panel A. This is confirmed by the insignificant effect of the share of Protestant deportees reported in Panel B.

[19]We do not do it in the baseline specification because it is a bad control.

without interruption, we can use the attainment of higher education as a proxy for a time-varying effect of the presence of deportees. In this case, educational attainment of cohorts that completed compulsory schooling before the deportees arrive can be considered as a pre-treatment outcome suitable to test for pre-trends in an event-study setting. In the 2010 census, respondents whose age is 80 or older are grouped together in one category. This group turned at least 15 in 1945, which means that they must have completed their 5-year compulsory schooling before the end of the WWII. Thus, as another test of the absence of pre-trends, we let the effect of the main explanatory variables vary by birth cohort of the respondent. The first two panels of Figure 6 visualize the results of this estimation focusing on Protestant deportees, for which we find an average effect. Panel A presents the specification in levels, and Panel B – in shares. Consistent with the causal interpretation of the effect of the group composition of deportees, only the younger cohorts, who did their compulsory schooling after deportees arrived, are affected by the number and the share of Protestant deportees.

5.2.3 Orbis, gender composition of company boards

An important indicator of gender norms in a society is the presence of female leadership in firms. We test whether deportee composition affected this outcome using Orbis firms data. Table 3 presents the results for the presence of a female among the company board directors (Columns 1 to 3) and the share of female directors (Columns 4 to 6). For each outcome, we present three sets of results: in the entire sample of Orbis firms in deportation destinations, in the subsample of small firms, and for firms in the service sector, which have a substantially larger presence of women in their company boards.[20] Similarly to the results for the FLFP, we find a positive significant effect of the number and of the share of Protestant deportees. The effect of the number of Muslim deportees is much smaller in absolute value and is insignificant. The results are robust to the use of different samples, with one caveat that in the service-sector sample, we cannot reject the equality of the effects for the numbers of Protestant vs. Muslim deportees, but the results is still significant in the specification with shares. All these regressions in addition to the standard baseline controls (region fixed effects, other deportees, and 1939 population) and the baseline geographic controls also include controls for firm characteristics: sector dummies, size-category dummies, and the number of directors (i.e., the size of the company board).

It is noteworthy that the Oster's deltas reported in the bottom row of Panel B are not large, which means that covariates used in these regressions reduce the magnitude of the estimated effect. In Online Appendix Table A11, we investigate how different

[20] 35% of all board members are women in this subsample, whereas the corresponding figure in the full sample is 26%.

sets of control variables affect the magnitude of the estimated effect focusing on the full sample and the female director dummy as the outcome variable. The first column restates the baseline, in Columns 2 to 7, we progressively extend the set of covariates from the most parsimonious specification. The effects are robust in terms of the sign and statistical significance of the effect of the Protestant deportees both in levels and in shares. Yet, the magnitude of the effects changes. As shown in Panel A, the coefficient on the log number of Protestant deportees drops in magnitude after the inclusion of baseline geographic controls. In addition, without the baseline geo-controls, the log number of Muslim deportees has a significant negative coefficient; whereas with these controls, the size of the effect is small and insignificant. Similarly, the magnitude of the point estimate of the coefficient on the share of Protestant deportees drops with the inclusion of baseline geo-controls, as can be seen from the comparison of Columns 1 vs. 2 to 4 in Panel B of Table A11. The presence of these controls is what drives Oster's deltas down. Importantly, however, after these controls are added, the additional covariates, such as the extended set of geographic controls and the number of firms in a municipality do not have a substantial effect on the magnitude of the point estimates (i.e., Column 1 vs. Columns 5 to 7 in Panel B of this table). Thus, we conclude that controlling for the misbalanced geographic covariates is important in this sample—the estimation includes Orbis firms in all deportation destinations across Russia and Central Asia—while other controls do not affect the results.

A one standard deviation increases in the log number of Protestant deportees and in the share of Protestant deportees (35.4% in this sample) both lead to an increase in the probability that there is a female director in a company by 1 percentage point, equivalent to about a 3.5% increase from the mean value of 29.8%. These increases also lead to an increase in the share of female directors by 0.7-0.8 percentage points, giving a range of 2.5-3.2% for an increase from the mean of 25.9%.

5.2.4 Robustness: clusters

We have already established robustness to controlling for a large set of covariates. Table A12 in the Online Appendix shows that our results are also robust to alternative assumptions about variance-covariance matrix and alternative weighting. In particular, we show that correcting standard errors for clusters at the level of subnational regions instead of municipalities or for spatial correlation using Conley (1999) correction at a radius of 150km or 200km give the same results.[21]

We also replicate the results using regressions at the level of municipalities rather

[21] To establish robustness to adjusting standard errors for spatial correlation, we take a random 10% sample of observations, because, otherwise, we lack computer power to calculate the SEs. To make sure that we have the correct benchmark, we replicate the baseline results in the reduced sample as well.

than individuals or firms by calculating municipality-level averages. The results remain significant, albeit they are somewhat weaker. There are two reasons for these differences: the municipality-level regressions give equal weights to larger and smaller municipalities, unlike individual-level regressions which weigh individuals and firms rather than municipalities equally, and municipality-level regressions do not include individual- and firm-level controls.

Overall, the results presented in this section indicate that female residents of the deportation destinations are more likely to be in the labor force and make a successful career in business if the local deportees were Protestant rather than Muslim. They also are more likely to chose not to have kids before the age of 30, and they are more likely to attain a higher-education degree. The latter is also true for men in these municipalities. The absence of pretrends, the historical narrative on which we base identification, and balance with respect to a large set of covariates suggest that these results are causal. Below, we examine what drives these results.

6 The effect beyond vertical cultural transmission

Even though the vast majority of deportees and their descendants left once they were allowed to leave and we measure the long-term outcomes after they are gone, some stayed. Thus, potentially, the results presented above could be driven by the presence of descendants of Protestants deportees in the deportation destinations. This would simply confirm the well established result in the literature that Protestants value gender equality and education and that there is a vertical cultural transmission of these traits (Becker, Rubin and Woessmann, 2021). In this section, we show that the vertical transmission of culture is not enough to explain the estimated effects and that cultural traits associated with gender equality were transmitted from Protestant deportees to the local native population. We proceed in three steps.

First, we consider the results from the Russian 2010 census. These data do not contain the identity of the respondents or their ethnic belonging. Thus, we use the aggregate regional-level ethnic composition and, in particular, the regional shares of groups comprised of Protestant and Muslim deportees to proxy for how many descendants of Protestant and Muslim deportees remain in each destination region. Assuming that the gender and age structure of the population is similar for different ethnic groups within each region, we predict that 38,871 respondents from the total of 1,457,810 adult females below 60 years old are the descendants of deportees. We do not know in which municipality within the region these women live. Thus, we make an assumption that the Protestant and Muslim deportee descendants are distributed across municipalities in each destination region proportionally to how these deportee groups were distributed

in 1951, based on the premise that there was little within-region mobility. As an alternative, we also consider a scenario that all descendants of Protestant deportees remain in the municipality where the majority of Protestant deportees lived in 1951 and the same for Muslim deportees, based on the premise of network effects in ethnic migration.

Then, we make the most extreme assumption in favor of the vertical cultural transmission: we assume that all female descendants of Protestant deportees are in the labor force and all female descendants of Muslim deportees are not in the labor force. And then eliminate these observations from the sample and repeat the analysis in this reduced dataset. In particular, we drop at random from each municipality those observations that match these criteria for being a descendant of Protestant and Muslim deportees. The number of dropped observations equals to the predicted number of descendants of Protestant and Muslim deportees in each municipality.

Given that this procedure ensures that we eliminate from the sample those observations that best fit the estimated relationship, the results represent the lower bound of the effect of the group composition of deportees on the local population, i.e., fully eliminating any effect from vertical transmission. Table 4 presents these results. They are weaker by construction than the results on the full sample, but they remain statistically significant and are robust to different sets of covariates with magnitudes similar to the full-sample estimation.

Second, we consider the results based on Orbis firms data. For the majority of firms, this dataset contains the full names of all company directors. As described in the data section, based on these names, we predict which directors are from the deportees groups.[22] Then, we use as outcome variables the share of female directors among all directors who do not belong to the deportee ethnic groups and an indicator for at least one such female director. The results are presented in Table 5; they are practically identical to those using the full sample of directors (Table 3).

Third, we also use an alternative survey data—the LiTS—which includes the ethnic identity of respondents. In this dataset, we focus only on those respondents who belong to the majority ethnic group in each Soviet Republic, i.e., Russians in Russia, Kazakhs in Kazakhstan, Uzbeks in Uzbekistan, Kyrgyz in Kyrgyzstan, and Tajik in Tajikistan. This ensures that the results are not driven by vertical transmission from ethnic deportees to their descendants. As the LiTS sample is very different and much smaller, we first verify that the sample of LiTS localities (Primary Sampling Units, PSUs) is also balanced in terms of the historical and geographical characteristics (see Online Appendix Table A13). Then, we use the educational attainment of the mothers of respondents from the majority groups to replicate our results, reaffirming the absence

[22] Out of 4,464,402 company directors with information on gender from our baseline sample of 1,271,415 Orbis firms, 63,703 directors are from deported ethnicities.

of pre-trends and the positive effect on higher educational attainment in an event-study setting. We predict the birth year of the mother of each respondent using respondent's age and aggregate data on the average age of women giving birth by women's birth cohort in the USSR. Then, as above, we compare the rate of attainment of higher education by mothers of respondents, depending on the composition of deportees in the respondent's locality and the timing of their mothers' compulsory schooling. Unlike the 2010 Census, where all respondents born before 1931 are grouped together, we have the exact predicted age for mothers of all respondents. Thus, for pre-deportation cohorts, we can have two groups: those born before 1929 and between 1926 and 1930. The results are presented in Panel C of Figure 6; they are similar to those from the 2010 Russia census: we find no significant effect of the share of Protestant deportees on higher education attainment for mothers who completed their compulsory schooling before the deportees arrived, and a positive effect for mothers of respondents who were at school at the time when deportees were already in their destinations. Consistent with the census results, we also find that exposure to Protestant deportees affected higher educational attainment of both mothers and fathers of the LiTS respondents, as presented in the first two columns of Online Appendix Table A14. Column 3 of this table shows that female respondents from the local majority groups are significantly more likely to have tried to start a business in those LiTS localities that were the destinations of Protestant deportees and this is not the case for male respondents (Column 4). This result is consistent with the baseline result from firm-level Orbis data on the gender composition of company boards. Finally, consistent with the baseline census results, we find a differential significant effect of exposure to Protestant (rather than Muslim) deportees for female fertility among local majority groups (Column 5) and no significant differential effect on male fertility (Column 6).

Overall, we conclude that vertical transmission of cultural traits from deportees to their descendants cannot fully explain our results. In the next section, we shed light on some of the mechanisms at play.

7 Mechanisms

The behavior of the local (nondeportee) population can be affected by the group composition of deportees for several reasons. One possibility is the horizontal cultural transmission from deportees to the local population, which directly affects the norms of the local population. Second, the deportees could have caused a change in the local environment, for instance, by developing certain sectors of the economy or building schools to increase supply of education, which in turn, could have affectted the behavior of locals without a change in their culture. Finally, selective in- and outmigration

of nondeportees to and from the deportation destinations could results in the association between the group composition of deportees and the norms of local nondeportee population if nondeportees self-selected based on cultural characteristics of deportees.

7.1 The effect on attitudes

We use LiTS to test whether the attitudes of the local population, and not only their behavior, are affected by the group composition of deportees. Table 6 presents the results. In the first three columns, we consider as outcome variables dummies for individual responses to each of the three questions about gender attitudes in LiTS with 1 indicating disagreement with a discriminatory statement. The outcome variable in Columns 4 is the composite measure of pro-gender-equality attitudes, i.e., the first principal component of the three individual measures, normalized to vary between 0 and 1. We find that the local population holds more equitable attitudes towards the role of women in society and in the family if their place of residence is in the vicinity of the destination of Protestant deportees. Consistent with the results using measures of behavior, such as FLFP and female firm leadership, the coefficients on the log number of Protestant deportees are positive and statistically significant for all considered measures of gender attitudes, whereas the effect of exposure to Muslim deportees on pro-gender-equality attitudes of local native population is consistently negative, but small and insignificant. The difference between the coefficients on the log numbers of Protestant vs. Muslim deportees is significant for all considered gender attitudes. Accordingly, the coefficients on the share of Protestant deportees are always positive, and significant for three out of four attitudinal outcomes.

In these regressions, we pool respondents of both genders together to increase the sample size. In the Online Appendix Table A15, we show that the results by subsample according to gender are very similar. In the Online Appendix, we show that these results are also robust to changes in the set of covariates (Table A16) and the Oster's deltas suggest that unobservables are not likely to drive the results after region fixed effects are included. Online Appendix Table A17 shows that these results are also robust to changes in the assumptions about the variance-covariance matrix. Details of these and other robustness exercises for the results based on LiTS data are given in Appendix E. Overall, the results are robust despite the fact that the number of observations in LiTS data is small.

One standard deviation increase in the log number of Protestant deportees leads to a 6.3-percentage-point increase in the share of respondents who hold more pro-gender-equality attitudes. One standard deviation increase in the share of Protestant deportees leads to a 5.3-percentage point increase in the pervasiveness of pro-gender-equality attitudes. These effects are somewhat larger than those for the outcomes

measuring behavior (especially relative to the sample mean of 18% of respondents who hold pro-gender-equality rather than traditional views). This could be due to a well established fact in social phycology that self-reported attitudes are more responsive to treatment than actual behavior (e.g., Brenner and DeLamater, 2016).

Overall, we conclude that the presence of Protestant deportees affected the attitudes, and not only the behavior, of the nondeportee local population.

7.2 Selective migration of nondeportee population?

The group composition of deportees could have triggered the migration of the local nondeportee population in and out of destination locations because—unlike deportees—the nondeportee population was (relatively) free to move.[23] We use a LiTS question about the region of residence of respondents' ancestors before WWII to test whether selective migration of nondeportees drives the results. The respondents provided the name of the subnational region and of the country of residence of their ancestors in 1939, which we geo-referenced.

Selective inmigration.—If the presence of deportees at destination locations attracted migrants with certain cultural characteristics, our results could be driven by selective in-migration. We limit the sample to respondents who report that their ancestors in 1939 lived in the same region as the respondent. Columns 1 to 3 of Table 7 replicate our LiTS results in this sub-sample: again, we find significant effects of exposure to Protestant deportees on pro-gender-equality attitudes and female entrepreneurship and no effect of exposure to Muslim deportees. This evidence strongly suggests that selective inmigration after WWII into the destination locations of ethnic deportations is unlikely be a driver of our results.[24]

Selective outmigration.—If those locals whose norms diverged the most from the norms of deportees were more likely to migrate out of deportation destinations, our results could be driven by selective outmigration. First, we test whether outmigration of locals depended on the group composition of deportees by considering all LiTS respondents whose ancestors before WWII lived in regions that subsequently became the deportation destinations (irrespective of where the respondents themselves live). Then, we reshape the data so that the unit of observation is an ancestor of the respondent. Namely, we consider all 9,277 ancestors who lived before the war in the regions that became the destinations of ethnic deportations during the war.

First, we estimate a linear probability model in which we regress a dummy for

[23] It is worth noting, however, that the post-war mobility of the population in the USSR was rather low, as the institution of *Propiska* created administrative restrictions on mobility for all Soviet citizens.

[24] However, this is only a partial test as the exact locality within the subnational region where respondents' ancestors lived before the war is not known, we cannot exclude migration within a subnational region.

whether the respondent's family outmigrated, (i.e., the respondent in 2016 lived in a different region from the region of his or her ancestor in 1939) on the log numbers of Protestant and Muslim deportees or on the share of Protestant deportees in the ancestor's region of origin. As we only know the place of origin of respondent's ancestors at the level of subnational region, in contrast to all other regressions, we cannot control for region fixed effects in this regression, instead, we control for the country of origin of the ancestor and the country of the destination of the respondent. Standard errors are corrected for two-way clusters by respondent and by the region of the respondent's ancestor. The results are presented in Column 4 of Table 7. We find no significant effect of the group composition of deportees on the probability that people moved out between 1939 and 2016.

However, the fact that the probability of outmigration is not related to the group composition of deportees does not mean that there was no *selective* outmigration. Even without differential outmigration from regions with Protestant and with Muslim deportees, there still could be selection of outmigrants depending on how their gender norms relate to those of a particular group of deportees. In this case, one would expect families with less equitable gender norms to move out of regions with Protestant deportees and with more equitable gender norms to move out of regions with Muslim deportees. Given that gender norms are partially determined through vertical transmission from ancestors to respondents, as the literature suggests, we can test whether gender attitudes of outmigrants differed systematically from those of stayers in a way that can be explained by the group composition of deportees. In particular, in the same sample of ancestors considered in Column 4, we regress gender attitudes of the respondents on a dummy indicating whether the respondent's family outmigrated since 1939 interacted with the log numbers of Protestant and Muslim deportees or with the share of Protestant deportees in the ancestor's region of origin. As this interaction varies within the region of ancestor's origin, we include ancestor region fixed effects in this estimation. If the family decision to outmigrate was related to the difference between the family's gender norms and the gender norms of deportees, one should expect a negative coefficient on the interaction between the dummy indicating that families moved out and the log number (and share) of Protestant deportees and one should expect a positive coefficient on the interaction between the dummy indicating that families outmigrated and the log number of Muslim deportees. The results of this estimation are presented in Column 5 of Table 7.[25] None of coefficients on any of these interaction terms are statistically significant. This evidence suggests that our results are also not driven by selective outmigration.

[25]The difference in the number of observations between Columns 4 and 5 of Table 7 comes from the fact that not all LiTS respondents answered all questions about gender attitudes.

To sum up, our results are unlikely to be driven by selective migration of nondeportees.

7.3 Did deportees affect local economic conditions?

Development and sector composition.— As the next step, we test whether the level of local development, productivity, or local sector composition are affected by the group composition of deportees. Theoretically, it could be the case that Protestant and Muslim deportees contributed differentially, e.g., through a different work ethnic, to local development or different deportee groups were conducive to the development of different sectors of the economy because of their different skills (as was the case with the resettlement of Greeks, described in Murard and Sakalli, 2020). If so, this could have affected the local population's gender norms not through a cultural transmission, but through deportees' effect on the economic conditions, which in turn may affect behavior and possibly even attitudes. The historical narrative about the Soviet postwar economy tells us that this is unlikely because of the highly centralized nature of the planning system (Zhuravskaya, Guriev and Markevich, forthcoming). In Table 8, we report the results of a series of tests which confirm that it is, indeed, unlikely. We consider the following contemporary outcomes: municipality-level nighttime light density as a proxy for long-term economic development (Column 1); firm-level revenue per worker of Orbis firms (Column 2); municipality-level sector shares in agriculture, construction, industry, public sector, services, and trade, calculated using Orbis firm-level data (in Columns 3 to 8).[26]

We test whether these outcomes are related to the group composition of deportees and find no robust effects. The presence of both Protestant and Muslim deportees is associated with many of these outcomes, but with the exception of the share in the services sector, the coefficients on the log numbers of Protestant and Muslim deportees have the same sign and are similar in magnitude, so that we cannot reject their equality; which is confirmed by the insignificance of the effects of the share of Protestant deportees (Panel B). Municipalities with a larger former presence of deportees from both religious groups have smaller share of firms in agriculture, less trade, but a larger share of firms working in the public sector. This is consistent with selection of deportations destination locations according to labor needs, indiscriminate in terms of the group composition of deportees. The only marginally significant differential effect that we find is for the share of firms in the service sector, which is higher in municipalities with a larger share of Protestant deportees (the difference in the coefficients of interest in the levels specification is insignificant, albeit the signs are consistent with

[26] Public sector is defined as all firms with the industry classified in Orbis as "Public Administration, Education, Health Social Services."

the specification in shares.) Interestingly, the services sector is the sector with the highest share of female directors and with a greater magnitude effect of the number and share of Protestant deportees on female leadership in firms. (The effect on female leadership in firms outside the services sector is smaller than in the services sector, but is statistically significant and is similar in magnitude to the effect in the full sample.) Thus, the development of the services sector in places with Protestant deportees may have been one of the channels. It also could be an outcome of the horizontal cultural transmission of pro-gender-equality norms from Protestant deportees to the local population because the baseline effect is present not only in the service sector and because the development of the service sector largely took place after the dissolution of the Soviet Union, and therefore, at the time or after the departure of most deportees.

Educational inputs.— We use administrative data on Russia's municipalities to test whether contemporary schooling environment and opportunities to get education vary systematically with the group composition of deportees. Table 9 reports the results where we consider contemporary municipal per capita total public expenditure, the share of municipal public expenditure on education, the number of schools per capita and per pupil, preschool attendance rate among children between 1 and 6 years of age, and the share of preschools with degraded physical infrastructure in a pooled cross-section of municipalities for a variety of years, including year and region fixed effects as well as other controls. First, we find that there is no differential effect of Protestant or Muslim deportees on public per capita expenditure: the destinations of ethnic deportations, irrespective of deportee composition, have lower per capita expenditures (Column 1). Yet, the coefficient on Protestant deportees is 44-times larger than the coefficient on Muslim deportees for the share of education expenditures. These coefficients are imprecisely estimated, however, so that the difference between them and the effect of the share of Protestant deportees are not statistically significant (Column 2).

Columns 3 and 4 consider the number of schools per capita and per pupil. We find negative and significant coefficients on the log number of Muslim deportees and near-zero coefficients on the log numbers of Protestant deportees. Yet, these are not sufficiently precisely estimated to reject the equality of these coefficients (p-values of these tests are 24.3 and 11.8%). It is worth reiterating that only the difference and not the level of these coefficients is well identified because the coefficients on the log numbers of the Protestant and Muslim deportees confound the size of the deportees with their group composition. The specification with the share of Protestant deportees as the dependent variable gives more precise results, so that the effect of the share of Protestant deportees is positive and significant. For preschool attendance rate, we find a positive and significant effect for Protestant deportees and a zero effect for Mus-

lim deportees; for this outcome, the difference between the coefficients is marginally significant in the levels specification, but the specification in shares lacks precision. Finally, the signs of the effects for the share of preschools with degraded buildings is consistent with relatively better quality of educational inputs in destination of deportations with a higher number and share of Protestants, but none of the effects are statistically significant. Overall, we find some evidence, albeit fairly weak in terms of statistical power and robustness, that there are more schools and higher attendance of preschools in places which were the destination of Protestant deportees compared to the destinations of Muslim deportees. The effects for the other outcomes are not precisely estimated, but their signs are consistent. A one standard deviation increase in the share of Protestant deportees is associated with an increase in the number of schools per 100 pupils by 0.05, i.e., one additional school per 2,000 pupils.

Thus, it is possible that at least some of our effects are driven by higher investments in educational infrastructure made by Protestant deportees compared to Muslim deportees at destinations, which resulted in different local schooling environments in places with a different group composition of deportees. However, it is also possible that the current schooling inputs are an outcome of the horizontal transmission of cultural norms from deportees to native population; and the higher attendance rate of preschools by children between 1- and 6-years-old may be an outcome of the willingness of young mothers to work. In addition, these results regarding educational inputs are too weak in terms of statistical significance and too small in terms of magnitude to be the main explanation for the robust results on FLFP, female leadership in firms, and the pro-gender-equality attitudes.

7.4 The horizontal transmission of cultural norms

The literature on cultural transmission highlights the costs and benefits of adopting cultural traits: horizontal cultural transmission is expected to be higher when benefits of adopting another culture are high and groups are close to each other culturally (see, for instance, Bisin and Verdier, 2010; Giuliano and Tabellini, 2020). These hypotheses allow us to provide evidence in favor of horizontal cultural transmission as the mechanism at play.

First, it is clear, that culturally German deportees—who before deportation lived in Russia's Volga region—were culturally closer to ethnic Russians than to the majority ethnic groups in the Central Asian Republics. This is true in terms of: (i) linguistic distance—Soviet Germans spoke Russian well but did not speak Central Asian languages; (ii) religious distance—Protestant Christianity, the traditional religion of Soviet Germans, is closer to Orthodox Christianity, the traditional religion of Russians, than to Islam, the traditional religion of Central Asians; and (iii) ancestral

genetic distance—Germans and Russians both have European ancestry, in contract to Central Asians (Mecham, Fearon and Laitin, 2006; Spolaore and Wacziarg, 2016). The premise that German deportees were culturally closer to Russians than to Central Asian groups is supported by anecdotal evidence on intermarriages: there were some intermarriages between Soviet Germans and Russians and practically no intermarriages between Central Asians and Soviet Germans (Mukhina, 2005). Thus, one should expect that, holding the environment and everything else constant, there is greater cultural transmission from German deportees to ethnic Russians than to the representatives of Central Asian ethnicities. To test this, we cannot simply compare the effects in Russia vs. Central Asia, because, in addition to the different majority groups, there are many other aspects of the environment that differ between Russia and Central Asia. Instead, we use the fact that after the abolition of serfdom in 1861 and the abolition of the peasant commune in 1906, ethnic Russians constituted a large minority in Central Asia (e.g., Chernina, Castaneda Dower and Markevich, 2014). We focus on Central Asia in LiTS, include in the sample all respondents who belong to nondeportee ethnicities in deportation destinations, and test for heterogeneity of the effect depending on whether the respondent is ethnic Russian.[27] Table 10 presents the results. In Column 1, we first verify that our LiTS results hold in this sample as well; and they are, indeed, very similar to Column 4 of Table 6. (LiTS analyses presented above included only the local majority groups, whereas these regressions also include minority ethnic groups. We control for ethnic group fixed effects.) In Column 2, we add to the set of covariates the interaction terms of the main explanatory variables with a dummy indicating that the respondent is ethnic Russian. We find that the effects of the log number and of the share of Protestant deportees are positive and significant for ethnic non-Russians, i.e., Central Asians, as can be seen from the direct effects, and the difference between the effects for Russians and non-Russians is also positive and significant, as can be seem from the coefficients on the interaction terms. Thus, exposure to Protestant deportees affects attitudes of local ethnic Russians more than local Central Asians. This evidence is consistent with the horizontal cultural transmission as the mechanism, because we observe higher cultural transmission for closer cultural groups in a similar environment.[28]

Second, the benefits of adopting the gender norms of Protestant vs. Muslim deportees for the local population differed greatly. In post-war USSR, the costs of adopting pro-gender-equality norms were smaller and the benefits of adopting these norms were

[27] There are no respondents who belong to deportee ethnic groups in LiTS PSUs that were close to deportation destinations in Central Asia. However, there are respondents who indicated "other" as their ethnic group. We exclude them from the sample.

[28] We cannot repeat this exercise for Russia because there are not enough respondents of Central Asian origin in the sample of Russian PSUs in LiTS.

larger than those of adopting more traditional gender norms. First and foremost, norms of gender equality were in line with the official ideology; and consequently, behavior according to traditional norms was associated with a risk of retribution by the state. Second, there were tangible economic benefits from adopting norms of gender equality: educated women earned higher wages and had more stable jobs in the Soviet Union. Both of these considerations imply that equitable gender norms should diffuse more than traditional gender norms. Consistent with horizontal transmission of gender norms as the main mechanism, this is exactly what we find, as the vast majority of the effects of the group composition of deportees on gender-related behavior and norms presented above are driven by the larger presence of Protestant deportees, whereas there is little effect of exposure to Muslim deportees.

Overall, the data limitations allow us to provide only suggestive evidence on the mechanism. Yet, we do show that the there was higher diffusion of gender norms from deportees to the local population when groups were culturally closer and when the benefits of adopting those norms were larger, consistent with horizontal transmission of cultural norms though learning and imitation. The results suggest that informal interactions between deportees and local population, for instance, at school and at work, have led to horizontal cultural transmission. Although, we have no data to document this, it is also likely that intergroup marriages between ethic Russians and German deportees have facilitated this horizontal cultural transmission. Furthermore, the destination locations of Protestant deportees today have a larger school supply and a larger service sector, both of which could be part of the supply-side mechanism, i.e., a causal effect of the Protestant deportees. However, these supply-side effects are insufficient to explain the baseline results fully. In addition, schooling supply and service sector development may also be an outcome of horizontal cultural transmission via changing the demand of the local population.

8 Conclusions

We study between-group horizontal cultural transmission using Stalin's ethnic deportations during WWII as a unique historical experiment. Groups with drastically different gender norms, such as Germans and Chechens, were deported to Siberia and Central Asia.

The destination municipalities within subnational regions were chosen in a way that made the pre-deportations gender norms of the local population, proxied by FLFP and female literacy, and a wide range of socio-economic and geographical characteristics of deportation destinations orthogonal to the group composition of deportees. In contrast, today, the local population of localities that were the destinations of deportees

with more pro-gender-equality norms have significantly higher FLFP, higher presence of females in company boards of directors, lower female fertility, and higher rates of tertiary educational attainment among women educated after the war, but not before the war. People also have more pro-gender-equality self-expressed attitudes if they live in the destinations of deportees with more pro-gender-equality norms. We show that these differences are observed among the local native residents of the deportation destinations and cannot be fully explained by vertical cultural transmission from deportees to their descendants, who remain at the deportation locations.

We, then, examine different potential explanations for the effect of the gender norms of deportees on the gender norms of natives. We show that selective in or out migration of the nondeportee population cannot explain the results. Then, we examine whether deportees transformed the economic environment of the destination localities, which in turn could have affected the behavior and attitudes of natives. We find no effect of the group composition of deportees on the level of economic development and productivity, or on sector composition, with the exception of a slightly larger service sector in the destinations of deportees with pro-gender-equality norms. We also observe a slightly larger supply of schools in these localities. However, these differences in the economic and educational environment are too small to fully explain the results. At the same time, consistent with horizontal cultural transmission, we find that the effects are heterogeneous and depend on the cultural distance as well as on the costs and benefits of the adoption of the norms.

Taken together, all these pieces of evidence suggest the diffusion of gender norms from deportees to the local population through horizontal transmission: the local population exogenously exposed to a deportee group with more equitable gender norms adopted pro-gender-equality attitudes and behavior through imitation and learning.

A broader implication of our analysis is that "cultural ghettos"—in which different groups, despite living in close proximity, do not interact and do not learn from each other—are not inevitable. More research is needed to understand the conditions conducive to avoiding cultural segregation.

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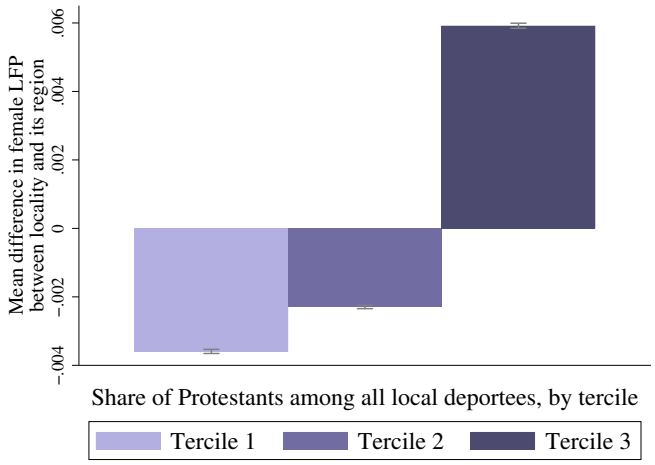
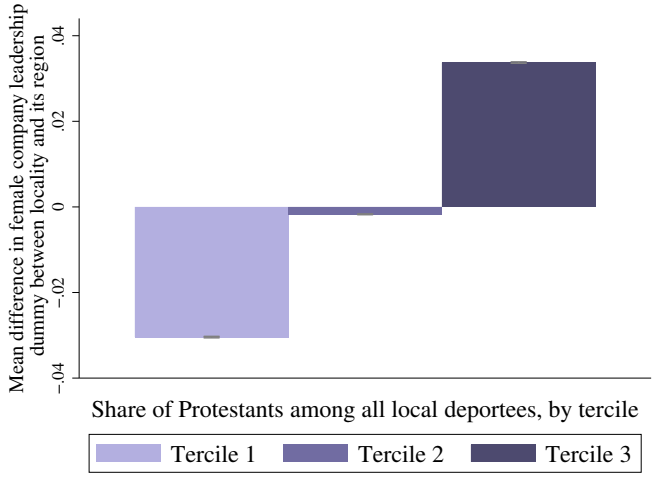
Figure 1: Mean difference in gender outcomes between the locality and its region, by tercile of the share of Protestants

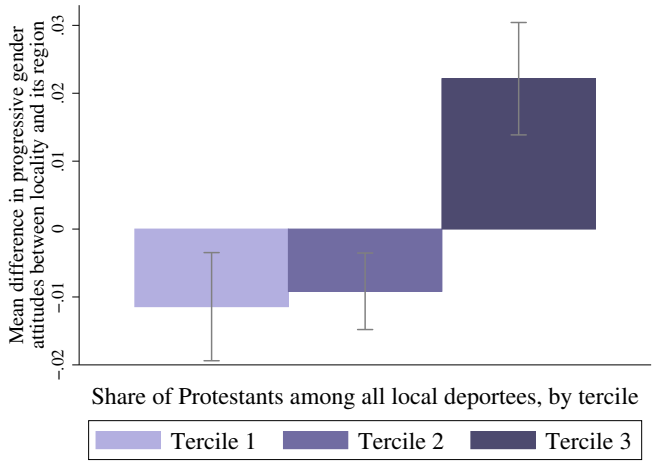
(a) Female Labor Force Participation (Census)



(b) Female Leadership in Firms (Orbis)



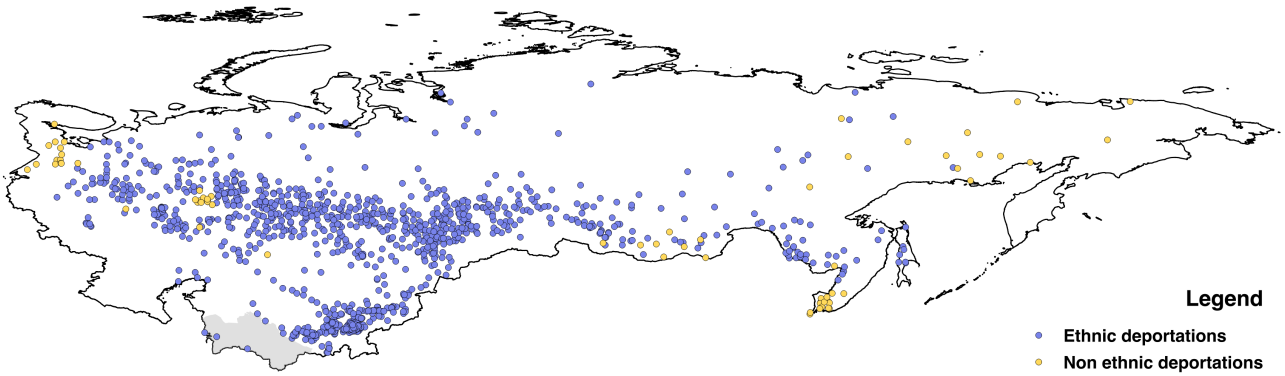
(c) Pro-Gender-Equality Attitudes (LiTS)



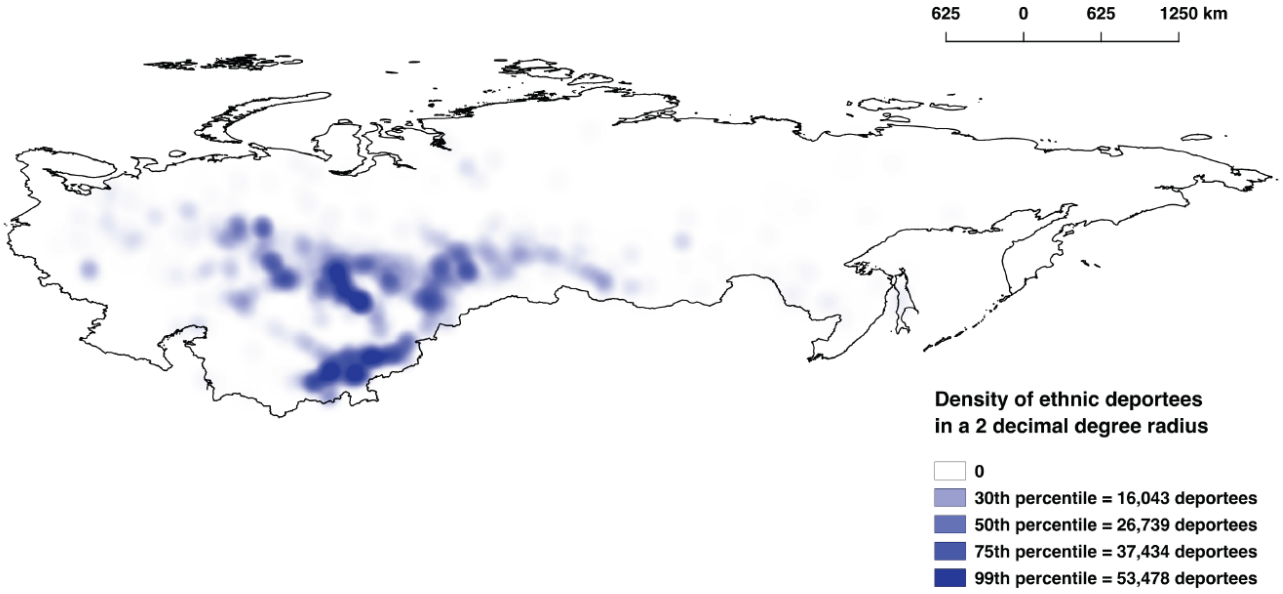
Note: The figure presents the mean difference between the main outcome variables in the locality and its region, by the tercile of the share of Protestants among all deportees in the locality. The mean share of Protestants among all deportees is -14 percentage points in the first tercile, 0 - in the second tercile, and + 14 percentage points in the third tercile.

Figure 2: Destinations of ethnic deportations on the map of the USSR

(a) Locations of all ethnic and nonethnic deportations



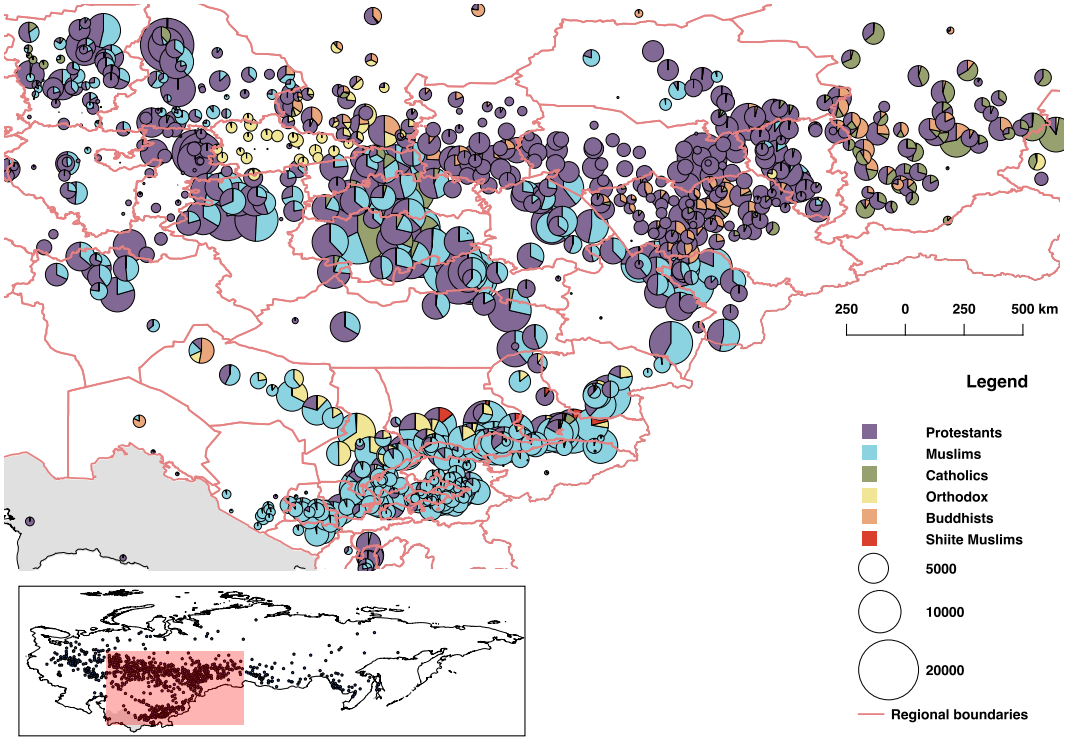
(b) Density of ethnic deportees at destinations



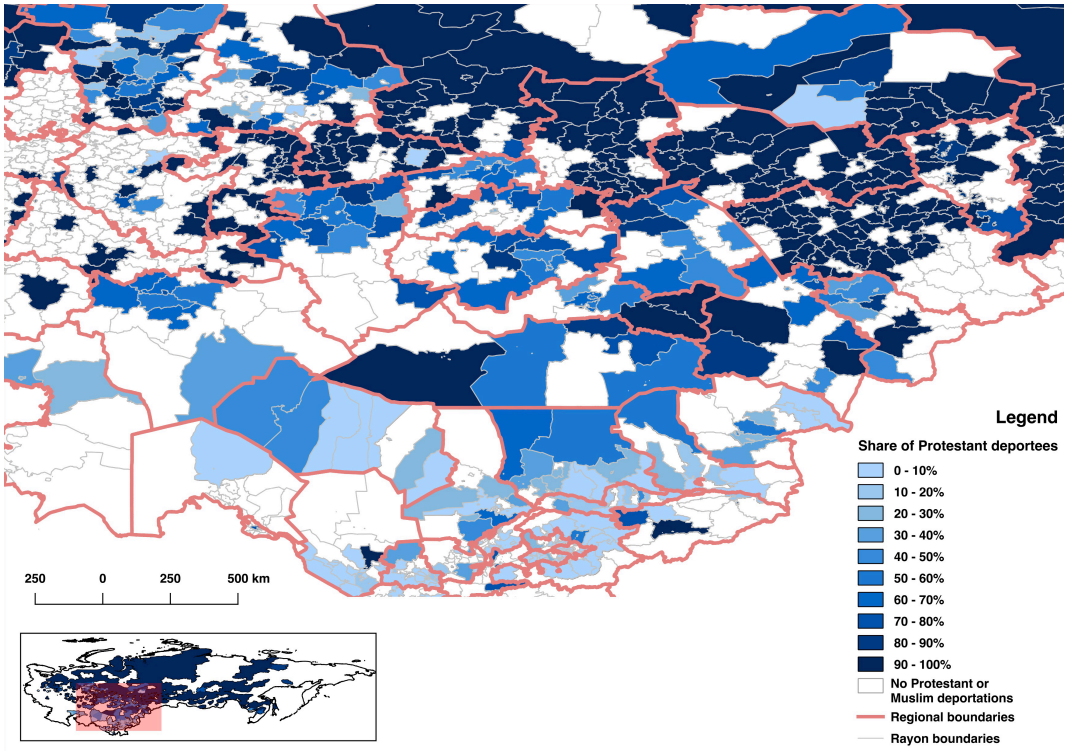
Note: Panel A presents the destination locations of ethnic deportations and nonethnic deportations (*kulaks* and other "anti-soviet elements"). Panel B presents the density of ethnic deportees at destination: the number of ethnic deportees per circle with 2 decimal-degree radius, estimated using a quartic (bi-weight) kernel function. The represented values are winsorized at the 99th percentile of the distribution. The legend shows values at 0, 30, 50, 70, and 99th percentiles.

Figure 3: Group composition and size of ethnic deportees at destinations

(a) Religious composition and size of ethnic deportations at destinations



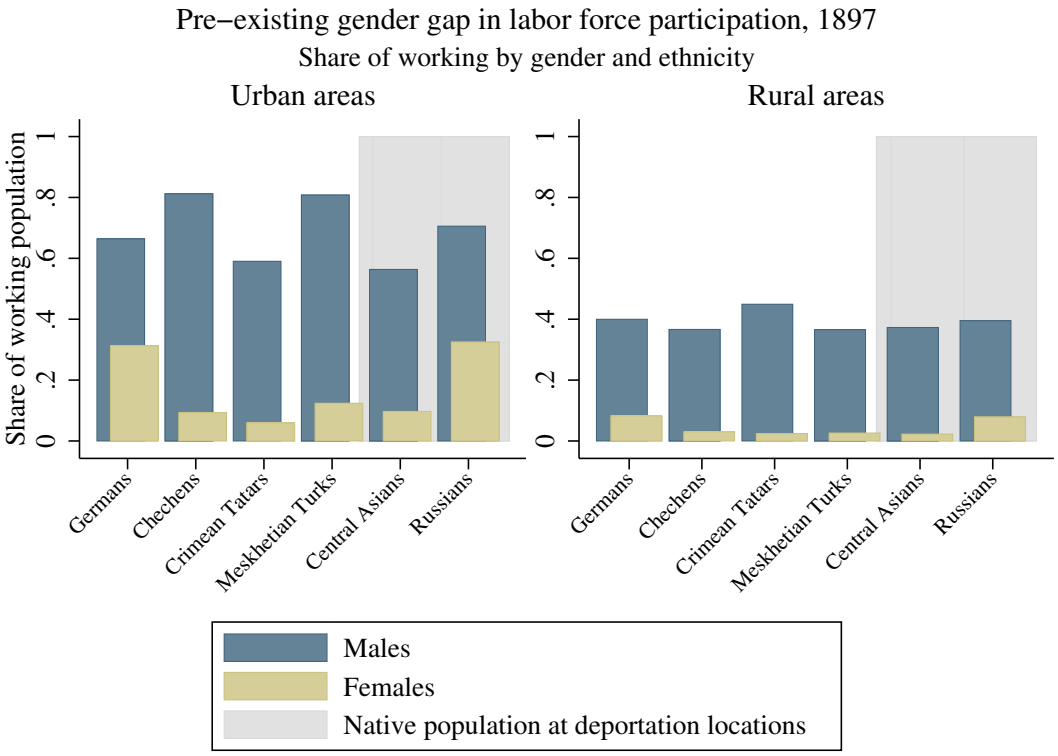
(b) The share of Protestant deportees at destination municipality



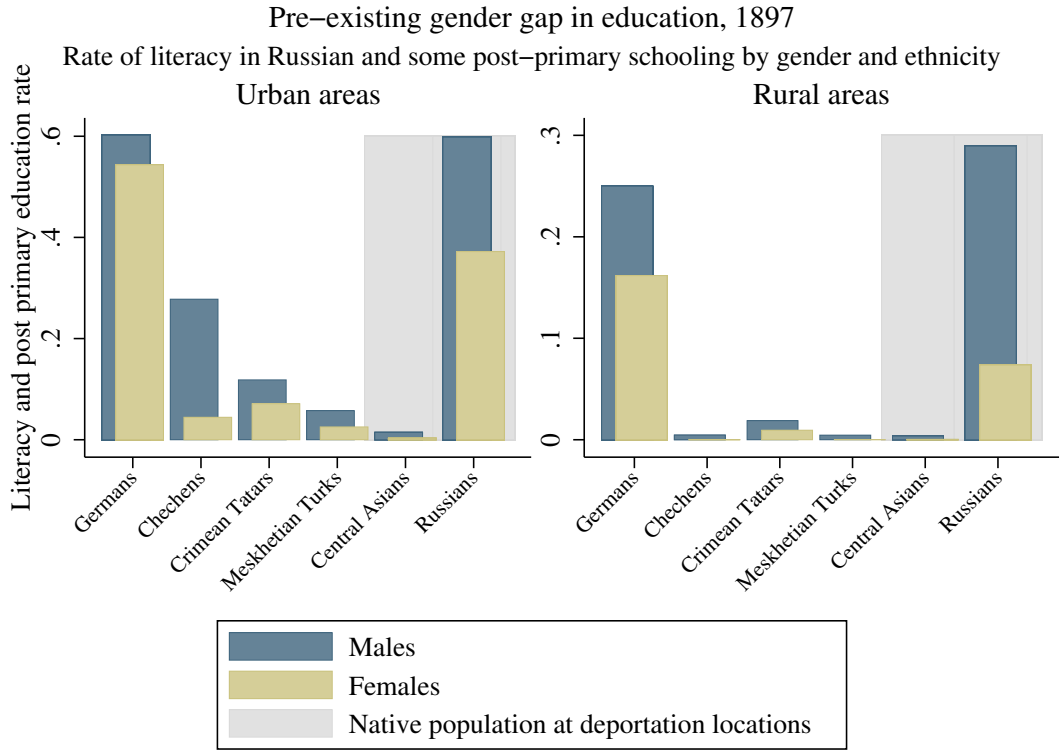
Note: The maps zoom into the area with the most sizable ethnic deportations. Panel A presents the size and the religious composition of ethnic deportations. Panel B presents the municipality-level variation in the share of Protestants among all Protestant and Muslim deportees. Both panels also present subnational-region boundaries (in the analysis, we rely on the within-region variation).

Figure 4: Pre-existing gender norms of deportee groups and of the local population at deportation destinations

(a) Labor force participation

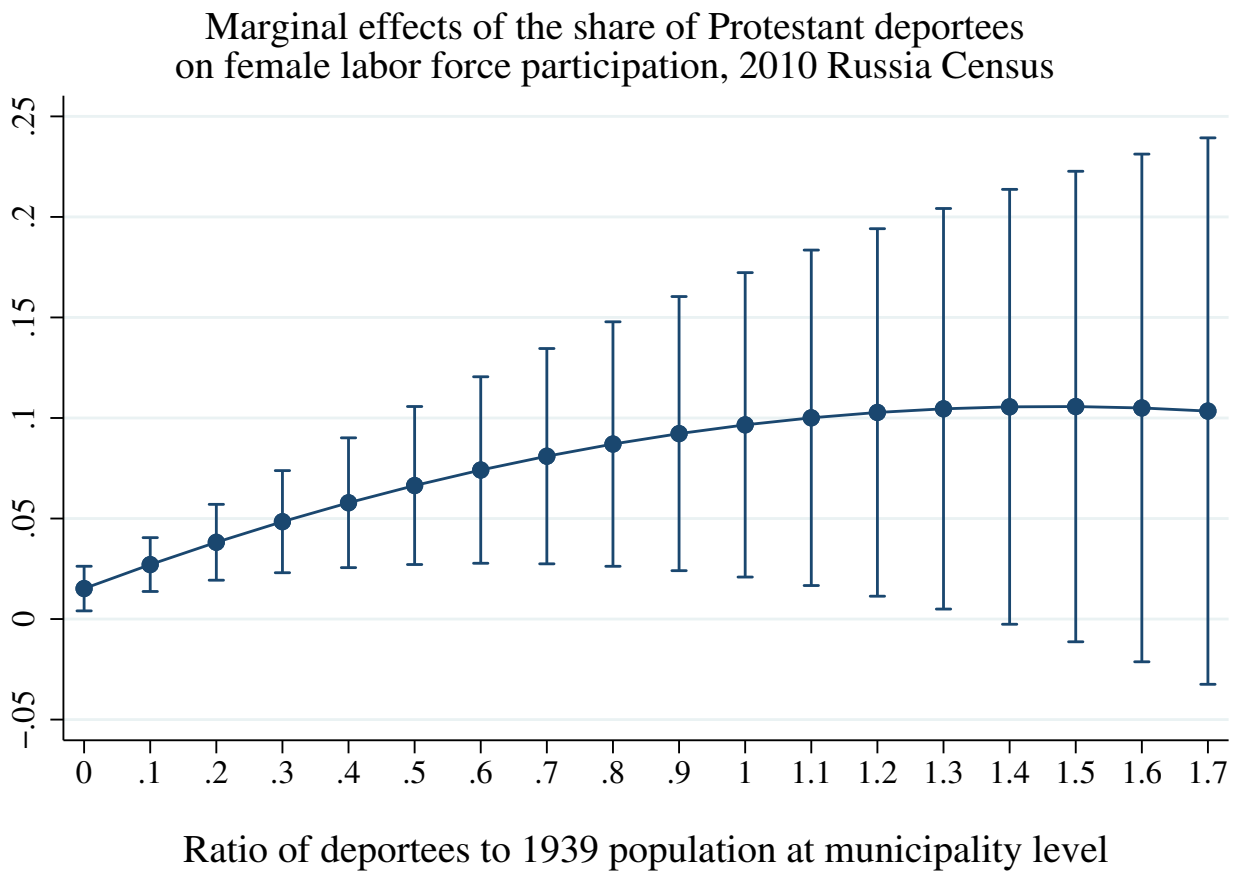


(b) Education



Source: 1897 Russian Empire census.

Figure 5: The size of the deportees relative to the local population



Note: The figure presents the margins plot for the marginal effect of the share of Protestant deportees on FLFP depending on the size of the ratio of the number of deportees to the local 1939 population. The estimated regression results are as follows: $Obs. = 1,454,153$; $R^2 = 0.15$;

$$
\begin{aligned}
FLFP = & \underset{[0.006]}{0.015} \times Protestant\_Deportee\_Share + \\
& + \underset{[0.041]}{0.124} \times Protestant\_Deportee\_Share \times \frac{Deportees}{Population_{1939}} + \\
& - \underset{[0.017]}{0.042} \times Protestant\_Deportee\_Share \times \left(\frac{Deportees}{Population_{1939}} \right)^2 + ...
\end{aligned}
$$

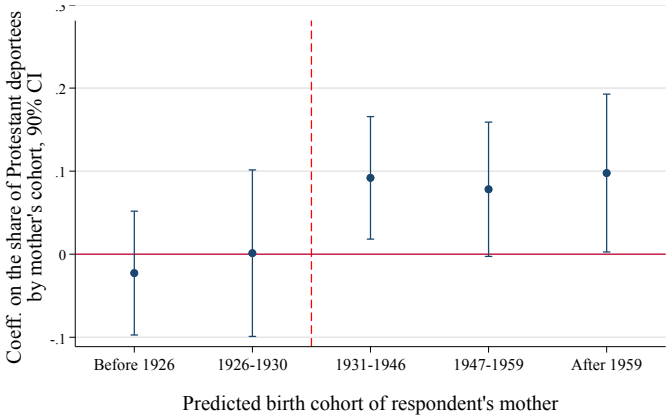
Figure 6: Event study: The effect of Protestant deportees on higher education among females by birth cohort

(a) 2010 Census female respondents' education by cohort as a function of the log number of Protestant deportees

figures/educ_fem_age_cohort_lnprot_EDITED_NT.pdf

(b) 2010 Census female respondents' education by cohort as a function of the share of Protestant deportees

(c) Education of mothers of LiTS respondents by predicted cohort as a function of the share of Protestant deportees



Note: The figure presents event study evidence for the effect of the share and number of Protestant deportees on the attainment of higher education among women. The outcome in Panels A and B is the higher education of female respondents from Census 2010. The outcome in Panel C is the attainment of higher education by mother's of respondents of the LiTS survey. The coefficients and 90% confidence intervals are displayed. The vertical line on all graphs marks the cohorts who finished compulsory schooling before or during WWII and those who went to school after WWII, i.e., after the deportations. Online Appendix Table A10 presents regression output.

Table 1: Testing for systematic differences in the main outcome variables prior to deportations: Outcomes are the from the 1897 Russian Empire Census

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable, both panels:	Female LFP		Urban Female LFP		Rural Female LFP		Share of literate females	
Panel A. The effect of the numbers of Protestant and Muslim deportees								
log(Protestant deportees + 1)	0.0002	-0.0001	-0.0002	-0.0005	-0.0002	-0.0004	0.0009	0.0007
	(0.0007)	(0.0006)	(0.0013)	(0.0014)	(0.0005)	(0.0005)	(0.0007)	(0.0006)
log(Muslim deportees + 1)	-0.0010	-0.0016	-0.0011	-0.0020	0.0006	0.0002	0.0011	0.0011
	(0.0017)	(0.0012)	(0.0029)	(0.0023)	(0.0005)	(0.0004)	(0.0009)	(0.0007)
R-squared	0.556	0.644	0.609	0.647	0.674	0.726	0.635	0.683
p-value: β(Protestant) = β(Muslim)	0.561	0.318	0.791	0.599	0.305	0.341	0.857	0.707
Panel B. The effect of the share of Protestant deportees								
Share of Protestant deportees	-0.0037	0.0007	-0.0086	-0.0026	-0.0072	-0.0037	-0.0090	-0.0078
	(0.0106)	(0.0084)	(0.0171)	(0.0160)	(0.0055)	(0.0040)	(0.0079)	(0.0063)
R-squared	0.555	0.625	0.608	0.640	0.675	0.710	0.635	0.675
Observations	1,042	1,042	1,042	1,042	1,042	1,042	1,042	1,042
Mean of dependent var.	0.0717	0.0717	0.208	0.208	0.0573	0.0573	0.0544	0.0544
SD of dependent var.	0.0432	0.0432	0.0985	0.0985	0.0369	0.0369	0.0506	0.0506
Geographic Controls		✓		✓		✓		✓

Note: *** p<0.01, ** p<0.05, * p<0.1. The unit of observation is a municipality with an ethnic deportation. We merge to deportation localities the values of the outcome variables in the county (*Uezd*) of the Russian Empire. The standard errors are clustered by Russian Empire counties. Panels A and B present the main specifications in levels and shares, respectively. In Panel A, we control for the log numbers of other (non-Protestant and non-Muslim) ethnic deportees and of nonethnic deportees. In Panel B, we control for the shares of all non-Protestant and non-Muslim deportees and the log total size of the deportations. All regressions control for 1897 country and province fixed effects, which is the analogue of the region in the Russian Empire. Odd columns do not include any geographic controls. Even columns include a set of geographical controls: distance to capital city, and summer and winter precipitation.

Table 2: The effect on female and male labor force participation
Sample: micro data on individuals, 10% of 2010 Russia Census

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent variable, both panels:	Labor force participation					Labor force participation			
Sample, gender:	Females					Males			
Sample, age:	Adults below 60 years old								
Panel A. The effect of the numbers of Protestant and Muslim deportees									
log(Protestant deportees + 1)	0.0033**	0.0030**	0.0031**	0.0029**	0.0029**	0.0001	0.0006	0.0004	0.0004
	(0.0015)	(0.0015)	(0.0015)	(0.0012)	(0.0012)	(0.0013)	(0.0012)	(0.0012)	(0.0012)
log(Muslim deportees + 1)	-0.0011	-0.0014	-0.0014	-0.0009	-0.0008	-0.0013	-0.0011	-0.0008	-0.0008
	(0.0014)	(0.0012)	(0.0012)	(0.0007)	(0.0007)	(0.0013)	(0.0011)	(0.0010)	(0.0010)
Municipality-level Male LFP				0.6652***	0.6645***				
				(0.0350)	(0.0354)				
R-squared	0.133	0.153	0.153	0.154	0.154	0.0881	0.132	0.132	0.132
p-value: β(Protestant) = β(Muslim)	*0.024***	*0.017***	*0.001***	*0.002***	*0.002****	*0.438*	*0.317*	*0.436*	*0.446*
Panel B. The effect of the share of Protestant deportees									
Share of Protestant deportees	0.0222**	0.0229**	0.0246***	0.0168***	0.0154***	0.0145	0.0134	0.0126	0.0121
	(0.0101)	(0.0093)	(0.0093)	(0.0056)	(0.0057)	(0.0089)	(0.0086)	(0.0086)	(0.0086)
Municipality-level Male LFP				0.6571***	0.6571***				
				(0.0352)	(0.0355)				
R-squared	0.133	0.153	0.153	0.154	0.154	0.0881	0.132	0.132	0.132
Oster's delta	2.75	3.10	3.44	1.69	1.422	–	–	–	–
Observations	1,496,681	1,454,153	1,454,153	1,454,153	1,454,153	1,326,893	1,290,131	1,290,131	1,290,131
Mean of dependent var.	0.741	0.741	0.741	0.741	0.741	0.843	0.843	0.843	0.843
SD of dependent var.	0.438	0.438	0.438	0.438	0.438	0.364	0.363	0.363	0.363
Region FE, deport. controls, age, mun. size	✓	✓	✓	✓	✓	✓	✓	✓	✓
1939 pop, family type & size, other mun. controls		✓	✓	✓	✓		✓	✓	✓
Baseline geographic controls			✓	✓	✓			✓	✓
Extended geographic controls				✓	✓			✓	✓
FLFP in 1897					✓				✓

Note: *** p<0.01, ** p<0.05, * p<0.1. The unit of observation is an individual in a municipality with an ethnic deportation. The sample covers Russia only due to data limitations. Standard errors are clustered at the municipality level. Panels A and B present the main specifications in levels and shares, respectively. All regressions include controls for region fixed effects and deportation controls ("deport. controls"). Deportation controls, in Panel A, are the log numbers of other (non-Protestant and non-Muslim) ethnic deportees and of nonethnic deportees, and, in Panel B, the shares of all non-Protestant and non-Muslim deportees and the log total number of deportees. Municipality size ("mun. size") controls are the log population with a quadratic term and log area. Family type is a set of dummies based on the number of adults and children in the family. Family size is the number of people in the family. Other municipality controls are rural/urban status and unemployment level. Baseline geographic controls are log distance to capital city and precipitation in winter and summer. Extended geographic controls add log distance to railroads, Gulag camps, and water, as well as temperature in winter and summer, ruggedness, and soil suitability for low and high inputs. We also control for 1897 female labor force participation Columns 5 and 9.

Table 3: The effect on female leadership in firms
Sample: ORBIS micro data on firms in Russia and all of Central Asia

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable, both panels:	Female director dummy			Share of female directors		
Sample, firms:	All	Small	Service sector	All	Small	Service sector
Panel A. The effect of the numbers of Protestant and Muslim deportees						
log(Protestant deportees + 1)	0.0035***	0.0026***	0.0041***	0.0022***	0.0022**	0.0022*
	(0.0009)	(0.0010)	(0.0012)	(0.0008)	(0.0010)	(0.0012)
log(Muslim deportees + 1)	-0.0005	-0.0010	0.0015	-0.0011	-0.0008	0.0005
	(0.0010)	(0.0011)	(0.0015)	(0.0009)	(0.0010)	(0.0014)
R-squared	0.094	0.022	0.060	0.063	0.094	0.094
p-value: β(Protestant) = β(Muslim)	0.007***	0.027**	0.215	0.017**	0.062**	0.402
Panel B. The effect of the share of Protestant deportees						
Share of Protestant deportees	0.0288***	0.0206**	0.0383***	0.0235***	0.0207**	0.0301**
	(0.0097)	(0.0103)	(0.0124)	(0.0080)	(0.0095)	(0.0119)
R-squared	0.0937	0.0979	0.0600	0.0583	0.0561	0.0252
Oster's delta	0.239	0.154	0.369	0.302	0.239	0.500
Observations	1,271,415	1,103,388	356,760	1,271,415	1,103,388	356,760
Mean of dependent var.	0.298	0.295	0.394	0.259	0.259	0.347
SD of dependent var.	0.457	0.456	0.489	0.418	0.419	0.454
Region FE, deportation controls	✓	✓	✓	✓	✓	✓
Industry FE, Company controls	✓	✓	✓	✓	✓	✓
Baseline geographic controls	✓	✓	✓	✓	✓	✓

Note: *** p<0.01, ** p<0.05, * p<0.1. The unit of observation is a firm in a municipality with an ethnic deportation. The sample covers both Russia and Central Asia. Standard errors are clustered at the municipality level. Panel A presents our main specification in levels. In Panel A, all regressions control for the size of all other deportee groups and a dummy for a deportation in the municipality. Panel B presents the specification in shares. In Panel B, all regressions control for the share of all other deportee groups (excluding Muslims) and the total size of deportations. All regressions include controls for region fixed effects, log of municipal population in 1939, industry fixed effects, company controls (industry dummies, size-category dummies and the number of directors in the company) and baseline geographic controls (distance to the capital city, average long-run precipitation in summer and in winter).

Table 4: The lower bound on the effect on female labor force participation of nondeported ethnicities
Sample: micro data on individuals, 10% of 2010 Russia Census

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable, both panels:	Labor force participation					
Sample, gender and age:	Female adults below 60 years old					
Assumption on Muslim and Protestant deportee descendants' distribution across municipalities within regions:	Proportional to deportee distribution across municipalities			In municipality with the largest number of deportees		
Panel A. The effect of the numbers of Protestant and Muslim deportees						
log(Protestant deportees + 1)	0.0029*	0.0027*	0.0025**	0.0031**	0.0029*	0.0028**
	(0.0016)	(0.0015)	(0.0012)	(0.0016)	(0.0016)	(0.0013)
log(Muslim deportees + 1)	-0.0011	-0.0013	-0.0007	-0.0007	-0.0009	-0.0003
	(0.0014)	(0.0012)	(0.0007)	(0.0014)	(0.0012)	(0.0007)
Municipality-level Male LFP			0.6697***			0.6773***
			(0.0360)			(0.0381)
R-squared	0.114	0.135	0.136	0.114	0.135	0.136
p-value: β(Protestant) = β(Muslim)	0.049**	0.035**	0.013**	0.068*	0.047**	0.018**
Panel B. The effect of the share of Protestant deportees						
Share of Protestant deportees	0.0239**	0.0259***	0.0166***	0.0204*	0.0231**	0.0136**
	(0.0107)	(0.0098)	(0.0059)	(0.0111)	(0.0101)	(0.0062)
Municipality-level Male LFP			0.6625***			0.6699***
			(0.0362)			(0.0385)
R-squared	0.114	0.135	0.136	0.114	0.135	0.136
Oster's delta	2.763	6.267	2.193	1.838	4.426	1.559
Observations	1,457,810	1,416,361	1,416,361	1,458,164	1,416,609	1,416,609
Mean of dependent var.	0.750	0.750	0.750	0.750	0.750	0.750
SD of dependent var.	0.433	0.433	0.433	0.433	0.433	0.433
Region FE, deport. controls, age, mun. size	✓	✓	✓	✓	✓	✓
1939 pop, municipality size, respondent's age		✓	✓		✓	✓
1939 pop, family type & size, other mun. controls		✓	✓		✓	✓
Baseline geographic controls		✓	✓		✓	✓
Extended geographic controls, FLFP in 1897			✓			✓

Note: *** p<0.01, ** p<0.05, * p<0.1. The unit of observation is an individual in a municipality with an ethnic deportation. The sample covers Russia only due to data limitations. Standard errors are clustered at the municipality level. Panels A and B present the main specifications in levels and shares, respectively. In Panel A, we control for the log numbers of other (non-Protestant and non-Muslim) ethnic deportees and of nonethnic deportees. In Panel B, we control for the shares of all non-Protestant and non-Muslim deportees and the log total size of the deportations. All regressions include controls for region fixed effects. Municipality size ("mun. size") controls are the log population with a quadratic term and log area. Family type is a set of dummies based on the number of adults and children in the family. Family size is the number of people in the family. Other municipality controls are rural/urban status and unemployment level. Baseline geographic controls are distance to log capital city and precipitation in winter and summer. Extended geographic controls add log distance to railroads, Gulag camps, and water, temperature in winter and summer, ruggedness and soil suitability for low and high inputs. Together with the extended geographic controls, we also add local FLFP in 1897 to the list of covariates.

Table 5: The effect on female firm directors excluding directors from deported ethnic groups
Sample: ORBIS micro data on firms in Russia and all of Central Asia

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable, both panels:	Female director dummy			Share of female directors		
Sample, directors:	Nondeported ethnicities only					
Sample, firms:	All	Small	Service sector	All	Small	Service sector
Panel A. The effect of the numbers of Protestant and Muslim deportees						
log(Protestant deportees + 1)	0.0034***	0.0026***	0.0039***	0.0020**	0.0020**	0.0020
	(0.0009)	(0.0010)	(0.0012)	(0.0008)	(0.0010)	(0.0012)
log(Muslim deportees + 1)	-0.0006	-0.0011	0.0015	-0.0013	-0.0011	0.0003
	(0.0010)	(0.0011)	(0.0015)	(0.0009)	(0.0010)	(0.0014)
R-squared	0.091	0.095	0.058	0.057	0.054	0.024
p-value: β(Protestant) = β(Muslim)	0.007***	0.025**	0.262	0.013**	0.053**	0.429
Panel B. The effect of the share of Protestant deportees						
Share of Protestant deportees	0.0285***	0.0206**	0.0369***	0.0231***	0.0205**	0.0302**
	(0.0096)	(0.0102)	(0.0125)	(0.0078)	(0.0093)	(0.0123)
R-squared	0.0912	0.0947	0.0578	0.0568	0.0544	0.0244
Oster's delta	0.264	0.168	0.391	0.356	0.278	0.602
Observations	1,258,706	1,092,116	353,368	1,258,706	1,092,116	353,368
Mean of dependent var.	0.297	0.294	0.393	0.256	0.256	0.345
SD of dependent var.	0.457	0.456	0.488	0.422	0.423	0.457
Region FE, deportation controls	✓	✓	✓	✓	✓	✓
Company controls, industry FE	✓	✓	✓	✓	✓	✓
Baseline geographic controls	✓	✓	✓	✓	✓	✓

Note: *** p<0.01, ** p<0.05, * p<0.1. The unit of observation is a firm in a municipality with an ethnic deportation. The sample covers both Russia and Central Asia. Standard errors are clustered at the municipality level. Panel A presents our main specification in levels. In Panel A, all regressions control for the size of all other deportee groups and a dummy for a deportation in the municipality. Panel B presents the specification in shares. In Panel B, all regressions control for the share of all other deportee groups (excluding Muslims) and the total size of deportations. In Panel B, the sample is further restricted to municipalities with a deportation. All regressions include controls for region fixed effects, log of municipal population in 1939, as well as a set of company controls (size-category dummies, and the number of directors in the company) and geographic controls (distance to the capital city, and average long-run precipitation in winter and in summer).

Table 6: Attitudes toward the role of women
Sample: respondents of the Life in Transition Survey in Russia and Central Asia

	(1)	(2)	(3)	(4)
Dependent variable, both panels:	Chose to disagree or strongly disagree (on 4-point Likert scale) with the statement:			1st Principal Component
	A woman should always do most of the household chores	It is better if the man earns the money in the family	Men make better political leaders than women do	Pro-gender-equality attitudes Normalized b/w 0 and 1
Sample:	All respondents, both genders			
Panel A. The effect of the numbers of Protestant and Muslim deportees				
log(Protestant deportees + 1)	0.029***	0.019**	0.020**	0.023***
	(0.002)	(0.008)	(0.009)	(0.004)
log(Muslim deportees + 1)	-0.002	-0.008	-0.017	-0.009
	(0.008)	(0.008)	(0.011)	(0.008)
R-squared	0.169	0.107	0.135	0.164
p-value: β(Protestant) = β(Muslim)	0.000***	0.022**	0.022**	0.0001***
Panel B. The effect of the share of Protestant deportees				
Share of Protestant deportees	0.182***	0.147***	0.133	0.154***
	(0.028)	(0.049)	(0.083)	(0.040)
R-squared	0.167	0.112	0.138	0.166
Oster's delta	1.499	-1.579	2.031	46.528
Observations	2,913	2,904	2,870	2,822
Mean of dependent var.	0.152	0.182	0.213	0.181
SD of dependent var.	0.359	0.386	0.409	0.271
Region FE and deportation controls	✓	✓	✓	✓
Baseline controls	✓	✓	✓	✓
Additional LiTS controls	✓	✓	✓	✓

Note: *** p<0.01, ** p<0.05, * p<0.1. Panel A presents our main specification in levels. In Panel A, all regressions control for the size of all other deportee groups. Panel B presents the specification in shares. In Panel B, all regressions control for the share of all other deportee groups (excluding Muslims) and the total size of deportations. In both panels, the sample is restricted to representatives of the majority group in each country, and to PSUs within 30km of a deportation. All regressions are conditional on religious group dummies and region fixed effects and on a set of individual controls (age, education, gender, and log of income) and geographic controls (the log of 1939 population, distance to the capital city, past/current capital and current urban status, soil suitability for low inputs, and average long-run precipitation and temperature in summer and winter). Standard errors are corrected for spatial correlation within a 150km radius following Conley (1999). The dependent variable in Columns 7 and 8 is the first principal component of questions used in Columns 1 to 6, normalized to a range between 0 and 1.

Table 7: Test for selective in-migration and outmigration of the nondeportee population LiTS respondents, whose ancestors lived in deportation regions in 1939

	(1)	(2)	(3)	(4)	(5)
Alternative hypothesis:	Selective in-migration			Selective outmigration	
Sample:	Ancestors lived in the same place as respondent			All respondents with ancestors in deportation regions	
Dependent variable, both panels:	1st Principal Comp. Pro-gender-equality attitudes		Tried to start a business	Family moved out	Gender attitudes
Sample, gender:	Female	Male	Female	Both	Both
Panel A. The effect of the numbers of Protestant and Muslim deportees					
log(Protestant deportees + 1)	0.016*	0.015***	0.018*		
	(0.008)	(0.003)	(0.010)		
log(Muslim deportees + 1)	0.001	0.006	-0.011		
	(0.013)	(0.010)	(0.013)		
Protestant deportees in ancestor's region (ln)				0.009	
				(0.020)	
Protestant deportees in ancestor's region (ln)					0.001
× Family moved out					(0.005)
Muslim deportees in ancestor's region (ln)				0.014	
				(0.016)	
Muslim deportees in ancestor's region (ln)					0.009
× Family moved out					(0.008)
Family moved out					-0.075
					(0.086)
R-squared	0.212	0.253	0.0948	0.305	0.155
Panel B. The effect of the share of Protestant deportees					
Share of Protestant deportees	0.100	0.117***	0.137		
	(0.096)	(0.043)	(0.090)		
Share of Protestant deportees in ancestor's region				-0.141	
				(0.139)	
Share of Protestant deportees in ancestor's region					0.022
× Family moved out					(0.044)
Family moved out					0.004
					(0.022)
R-squared	0.216	0.247	0.0956	0.303	0.154
Observations	1,006	738	1,030	9,277	8,661
Mean of dependent var.	0.118	0.126	0.113	0.388	0.210
SD of dependent var.	0.323	0.332	0.317	0.487	0.280
Region FE and Controls	✓	✓	✓		
Country of destination and of origin FEs				✓	✓
Clustered by region of origin and respondent				✓	✓
Sample: Ancestors from deportation regions				✓	✓
FE for the region of ancestor					✓

Note: *** p<0.01, ** p<0.05, * p<0.1. Panel A and B present our main specifications in levels and shares, respectively. In columns 1-3: the sample is restricted to respondents whose ancestors lived in 1939 in the same region as the respondents. Standard errors are corrected for potential spatial correlation within a 150km radius following Conley (1999). In columns 4 and 5: the sample is comprised of all ancestors from regions with Protestant or Muslim deportation. The unit of analysis is the respondent's ancestor. In column 4, the dependent variable is a dummy equal to one if the respondent lives in a different region than the region of residence of either his or her ancestors in 1939. In column 5, we use this variable as the explanatory variable and the dependent variable is the 1st principal component of gender attitudes. These regressions controls for the size of all other deportee groups, the gender of the parent, country of destination fixed effects, and country of origin fixed effects. Two-way clusters are applied: by respondent and by the region of origin of the ancestor. In Column 5, fixed effects for the region of ancestor's origin are included in the set of covariates.

Table 8: Tests for economic development and sector composition as potential mechanisms

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Potential mechanism:	Economic development		Sector composition					
Dependent variable,	Nighttime light	Revenue per	Sector share, weighted by firm size:					
both panels:	density (ln)	worker (ln)	Agriculture	Construction	Industry	Public	Services	Trade
Panel A. The effect of the numbers of Protestant and Muslim deportees								
log(Protestant deportees + 1)	0.0317	-0.0131**	-0.0089**	-0.0049***	0.0000	0.0177***	0.0017	-0.0044*
	(0.0412)	(0.0061)	(0.0040)	(0.0017)	(0.0045)	(0.0037)	(0.0029)	(0.0024)
log(Muslim deportees + 1)	0.0665	-0.0104	-0.0110***	-0.0015	0.0024	0.0192***	-0.0031	-0.0066***
	(0.0441)	(0.0074)	(0.0040)	(0.0013)	(0.0047)	(0.0045)	(0.0033)	(0.0023)
R-squared	0.405	0.179	0.378	0.268	0.164	0.484	0.219	0.242
p-value: β(Protestant) = β(Muslim)	0.591	0.820	0.756	0.186	0.747	0.822	0.344	0.571
Panel B. The effect of the share of Protestant deportees								
Share of Protestant deportees	-0.4147	0.1227	-0.0331	-0.0200	-0.0054	-0.0268	0.0679*	0.0331
	(0.3825)	(0.0809)	(0.0448)	(0.0141)	(0.0521)	(0.0503)	(0.0366)	(0.0208)
R-squared	0.404	0.179	0.373	0.255	0.161	0.416	0.225	0.236
Oster's delta	1.448	-0.424	0.304	0.250	-0.189	-0.382	0.366	0.383
Observations	1,054	374,043	814	766	811	782	817	814
Mean of dependent var.	-4.716	3.139	0.215	0.0561	0.251	0.139	0.239	0.116
SD of dependent var.	2.665	1.895	0.232	0.0770	0.210	0.234	0.178	0.119
Region FE	✓	✓	✓	✓	✓	✓	✓	✓
Baseline controls	✓	✓	✓	✓	✓	✓	✓	✓
Unit of analysis	Municipalities	Orbis firms	Municipalities	Municipalities	Municipalities	Municipalities	Municipalities	Municipalities

Note: *** p<0.01, ** p<0.05, * p<0.1. Panel A and B present our main specifications in levels and shares, respectively. We control for the total size of deportations and the size of all other deportee groups in Panel A and the share of all other deportee groups (excluding Muslims) in Panel B. In Columns 1 and 3 to 8: the unit of observation is deportation municipality. In Column 2, the unit of observation is Orbis firm. We control also for the log of 1939 population, distance to the capital city, and average long-run precipitation in summer and winter and region fixed effects in all regressions. In Column 3 to 8, we also control for company size (ln), operating revenue (ln) aggregated to the district-level controls, as well as the number of firms in the municipality. In Column 2, additional controls include the number of company directors for which gender was available and the number of firms in the municipality. In Column 2, standard errors are clustered by municipality. In Columns 1 and 3 to 8, standard errors are robust.

Table 9: Test for educational inputs as a mechanism

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable, both panels:	Total budget expenditure per capita	Share of expenditures on education	Number of schools per 100 people	Number of schools per 100 pupils	Preschool attendance rate	Share of preschools with degraded buildings
Panel A. The effect of the numbers of Protestant and Muslim deportees						
log(Protestant deportees + 1)	-1.3274**	0.2126	-0.0005	0.0007	0.0053***	-0.5242
	(0.5227)	(0.1477)	(0.0006)	(0.0054)	(0.0018)	(0.5917)
log(Muslim deportees + 1)	-1.1046**	0.0048	-0.0017***	-0.0137**	-0.0001	0.5459
	(0.5412)	(0.1327)	(0.0006)	(0.0058)	(0.0021)	(0.5141)
R-squared	0.231	0.592	0.711	0.617	0.196	0.214
p-value: β(Protestant) = β(Muslim)	0.711	0.323	0.243	0.118	0.087*	0.223
Panel B. The effect of the share of Protestant deportees						
Share of Protestant deportees	-0.9658	1.7593	0.0136*	0.1482**	0.0182	-1.2954
	(3.9502)	(1.6127)	(0.0074)	(0.0744)	(0.0226)	(5.2768)
R-squared	0.231	0.592	0.709	0.614	0.196	0.212
Oster's delta	-0.359	4.814	4.402	16.99	-3.086	-0.600
Unit of analysis	Municipalities × Years					
Years in sample	2006 to 2018	2006 to 2018	2006 to 2017	2006 to 2017	2009 to 2011	2012 to 2018
Observations	6,546	6,799	6,106	6,105	1,082	2,170
Mean of dependent var.	26.65	49.74	0.0738	0.639	0.701	12.23
SD of dependent var.	57.20	13.54	0.0460	0.348	0.101	20.15
Region and year FE	✓	✓	✓	✓	✓	✓
Baseline controls	✓	✓	✓	✓	✓	✓
Log mun. population and type	✓	✓	✓	✓	✓	✓

Note: *** p<0.01, ** p<0.05, * p<0.1. Panel A and B present our main specifications in levels and shares, respectively. These regressions control for the total size of deportations and the size of all other deportee groups in Panel A and the share of all other deportee groups (excluding Muslims) in Panel B. The unit of observation is municipality × year. We also control for region and year fixed effects. Baseline controls also include the log of 1939 population, distance to the capital city, and average long-run precipitation in summer and winter in all regressions. Additional controls include the log of current municipal population with squared term separately for urban and rural types of municipalities. Standard errors are clustered by municipality.

Table 10: Test for the ease of horizontal cultural transmission: Russians in Central Asia

	(1)	(2)
Dependent variable, both panels:	1st principal component Pro-gender-equality attitudes	
Sample:	Central Asia, all respondents with known (nondeportee) ethnicities, LiTS	
Panel A. The effect of the numbers of Protestant and Muslim deportees		
log(Protestant deportees + 1)	0.021***	0.021***
	(0.003)	(0.003)
log(Muslim deportees + 1)	-0.009	-0.009
	(0.007)	(0.007)
log(Protestant deportees + 1) × Ethnic Russian respondent		0.015**
		(0.006)
log(Muslim deportees + 1) × Ethnic Russian respondent		0.001
		(0.010)
R-squared	0.167	0.168
Panel B. The effect of the share of Protestant deportees		
Share of Protestant deportees	0.120**	0.106***
	(0.047)	(0.041)
Share of Protestant deportees × Ethnic Russian respondent		0.167*
		(0.092)
R-squared	0.162	0.164
Observations	3,215	3,215
Mean of dependent var.	0.184	0.184
SD of dependent var.	0.275	0.275
Region and year FE	✓	✓
Controls	✓	✓

Note: *** p<0.01, ** p<0.05, * p<0.1. Panel A and B present our main specifications in levels and shares, respectively. These regressions control for the total size of deportations and the size of all other deportee groups in Panel A and the share of all other deportee groups (excluding Muslims) in Panel B. All regressions control for region fixed effects, the log of 1939 population, age, gender, education, log income, ethnicity, and religion of respondent. Standard errors are corrected for spatial correlation within a 150km radius following Conley (1999).

A Online Appendix Tables and Figures

Table A1: Ethnic deportees by religion and destination

	The number of ethnic deportees by religion and destination						
		Soviet republic of destination					
Ethnicity (% in religious group):	All	Russia	Kazakhstan	Uzbekistan	Kyrgyzstan	Tajikistan	Turkmenistan
Protestants:	**52.7%**	**31.1%**	**19.5%**	**0.3%**	**0.7%**	**1%**	**0.1%**
Germans (96.5%)	1,103,654	634,807	423,185	6,424	15,877	21,012	2,349
Latvians	35,707	35,707	-	-	-	-	-
Estonians	3,790	3,790	-	-	-	-	-
Muslims:	**34.6%**	**2.3%**	**19.0%**	**7.3%**	**5.8%**	**0.2%**	-
Chechens (60%)	450,119	411	375,300	98	74,272	38	-
Crimean Tatars (25%)	184,827	44,434	6,465	127,999	1,118	4,804	7
Meskhetian Turks (10%)	75,450	4,518	30,032	31,333	9,567	-	-
Karachay	25,415	-	-	-	25,415	-	-
Balkar	15,093	-	-	-	15,093	-	-
Catholics and Jews:	**6.6%**	**4.6%**	**2.0%**	-	-	-	-
Lithuanians	78,921	78,921	-	-	-	-	-
Poles (Catholics and Jews)	43,814	7	43,807	-	-	-	-
Baltic	19,884	19,881	3	-	-	-	-
Orthodox:	**3.1%**	**1.4%**	**1.7%**	-	-	-	-
Greeks	36,776	-	36,767	-	9	-	-
Moldavians	29,988	29,988	-	-	-	-	-
Buddhists:	**2.9%**	**2.7%**	**0.1%**	-	-	-	-
Kalmyk	62,251	58,749	2,374	756	262	105	5
Shia Muslims:	**0.2%**	-	**0.2%**	-	-	-	-
Iranians	4,460	-	4,460	-	-	-	-
Number of destination municipalities	1,131	774	190	97	55	12	3

Notes: Source: 1951 NKVD Deportation Census. "-" denotes zero. We cannot distinguish between Poles (who were Catholics) and Jews deported from annexed territories of Poland. These numbers are a poor indication of how many people were deported from their homelands, as the death toll during the journey to the destination places and shortly after arrival to the destinations was very high (Polian, 2004). Westren (2012) argues that, before 1950, the death rate among deportees exceeded the birth rate (p. 149), and after 1950, the mortality rate among deportees declined. Thus,1951 data are well suited to analyze exposure of the local native population to deportees. Appendix Figure A1 presents photos of deportees from the two largest groups: Germans and Chechens.

Table A2: Summary statistics, 2010 Census sample

Sample:	10% of Census 2010 respondents			
	All ages		Age 17-60	
	Mean	SD	Mean	SD
Main outcomes:				
Labor force participation	0.5272	0.4993	0.7889	0.4081
Respondent has a child	0.3841	0.4864	0.5098	0.4999
Age at birth of first child	25.6707	5.3966	25.1729	5.0680
Completed higher education	0.1820	0.3859	0.2420	0.4283
Post-graduate education	0.0035	0.0594	0.0038	0.0618
Main explanatory variables and controls:				
Protestant deportees (ln)	6.4844	2.1542	6.4927	2.1511
Muslim deportees (ln)	2.1188	2.6738	2.1160	2.6711
Other ethnic deportees (ln)	6.9874	1.9129	6.9960	1.9095
Non ethnic deportees (ln)	3.7086	3.2212	3.7363	3.2198
All deportees (ln)	7.3746	1.7323	7.3867	1.7260
Share of Protestant deportees	0.6096	0.3358	0.6074	0.3359
Share of other ethnic deportees	0.8126	0.2780	0.8107	0.2789
Share of non-ethnic deportees	0.1874	0.2780	0.1893	0.2789
Ratio deportees to 1939 population	0.0523	0.1278	0.0533	0.1341
Other baseline controls:				
Female	0.5447	0.4980	0.5301	0.4991
Age	37	21	38	12
Population (ln)	12.4008	1.4890	12.4385	1.4764
Area of district (ln)	8.2268	1.2898	8.2389	1.3134
Married couple without children	0.1855	0.3887	0.1868	0.3898
Married couple without children under 18	0.1199	0.3248	0.1672	0.3732
Married couple with children under 18	0.3114	0.4631	0.2892	0.4534
Mother without children under 18	0.0705	0.2561	0.0889	0.2846
Mother with children under 18	0.0848	0.2786	0.0626	0.2422
Father without children under 18	0.0087	0.0928	0.0109	0.1040
Father with children under 18	0.0075	0.0863	0.0056	0.0746
Single person	0.2116	0.4085	0.1888	0.3913
Family size	2.5169	1.1341	2.5340	1.0756
Unemployment rate in district	0.0934	0.0170	0.0934	0.0170
Urban	0.4858	0.4998	0.4912	0.4999
Rural	0.5142	0.4998	0.5088	0.4999
Log of 1939 population	11.1613	1.1548	11.1636	1.1685
Male labor force participation	0.8552	0.0272	0.8549	0.0272
Distance to capital city (ln)	6.8743	0.5602	6.8787	0.5602
Precipitation (Dec-Feb) (ln)	3.2133	0.4601	3.2131	0.4595
Precipitation (June-August) (ln)	4.1956	0.2185	4.1950	0.2188
Extended set of controls:				
Distance to railroad (ln)	2.1822	1.2933	2.1789	1.2995
Distance to Gulag camps (ln)	3.5817	1.3471	3.5759	1.3597
Distance to water (ln)	2.5682	1.1635	2.5631	1.1641
Ruggedness (ln)	4.4530	0.1628	4.4531	0.1621
Temperature (June-August)	16.600	2.0190	16.5827	2.0522
Temperature (Dec-Feb)	-15.131	4.618	-15.172	4.654
Soil Suitability high inputs (ln)	1.1701	0.3917	1.1747	0.3938
Soil Suitability low inputs (ln)	1.3760	0.3686	1.3808	0.3701
Observations	4,416,144		2,823,574	

Table A3: Summary statistics, Orbis sample

Sample:	Orbis firms in Russia and Central Asia in Russia and Central Asia	
	Mean	SD
Main outcomes:		
Female director dummy	0.2978	0.4573
Share of female directors	0.2591	0.4183
Operating revenue per worker (ln)	3.1395	1.8949
Main explanatory variables and controls:		
Protestant deportees (ln)	5.4049	2.9366
Muslim deportees (ln)	5.3196	3.4928
Other ethnic deportees (ln)	2.1236	2.7052
Non-ethnic deportees (ln)	1.3934	2.4544
All deportees (ln)	7.7960	1.3592
Share of Protestant deportees	0.3572	0.3540
Share of other ethnic deportees	0.0658	0.1800
Share of non-ethnic deportees	0.0805	0.2321
Other baseline controls:		
Number of directors	1.2827	0.9857
Number of firms in district	41995	47011
Firm size: Small	0.8678	0.3387
Firm size: Medium	0.0606	0.2386
Firm size: Large	0.0049	0.0700
Firm size: Very large	0.0011	0.0339
Firm size: Missing	0.0655	0.2473
Agriculture sector	0.0817	0.2740
Construction sector	0.1166	0.3210
Industry sector	0.0837	0.2770
Public sector	0.1062	0.3080
Services ector	0.3483	0.4764
Trade sector	0.2635	0.4405
Log of 1939 population	11.097	0.9864
Distance to capital city (ln)	4.8413	2.2358
Precipitation (June-August) (ln)	3.3821	1.0273
Precipitation (Dec-Feb) (ln)	3.3039	0.4555
Extended set of controls:		
Distance to railroad (ln)	1.5180	1.1790
Distance to Gulag camps (ln)	3.1580	1.8482
Distance to water (ln)	2.2672	0.9525
Ruggedness (ln)	4.4822	0.1709
Average summer temperature	20.3976	4.0163
Average winter temperature	-8.6961	7.6985
Soil Suitability high inputs (ln)	1.1155	0.3711
Soil Suitability low inputs (ln)	1.4033	0.3066
Observations	1,271,415	

Table A4: Summary statistics, LiTS sample

Sample:	Life in Transition Survey respondents	
	Mean	SD
Main outcomes:		
Disagree: A woman should do most of the household chores	0.1521	0.3592
Disagree: It is better for everyone if the man earns the money	0.1801	0.3844
Disagree: Men make better political leaders	0.2159	0.4115
Pro-gender-equality attitudes 1st PC	0.1818	0.2710
Tried to start a business	0.1497	0.3568
Respondent has a child	0.5355	0.4988
Mother completed tertiary education	0.1388	0.3458
Father completed tertiary education	0.1923	0.3942
Main explanatory variables and controls:		
Protestant Deportees (ln)	5.4884	2.7213
Muslim Deportees (ln)	6.8885	2.7396
Other ethnic deportees (ln)	1.7463	2.5045
Total non-ethnic deportations (ln)	1.1987	2.3641
All deportations (ln)	8.1881	1.4516
Share of Protestant deportees	0.3059	0.3442
Share of other ethnic deportees	0.0346	0.1166
Share of non-ethnic deportees	0.0363	0.1282
Other baseline controls:		
Age of respondent	42.8194	14.9012
Highest education completed	4.8012	1.1447
Household net monthly income (ln)	11.0423	2.6209
Mother's educational level	4.0632	1.3584
Father's educational level	4.3243	1.4113
Predicted mother's age	69.4435	15.8819
Log of 1939 population	11.4811	1.7973
Capital (old or new)	0.1243	0.3299
Urban	0.4511	0.4977
Travel distance to capital city (ln)	5.0388	1.6396
Precipitation (June-August) (ln)	2.5127	1.0984
Precipitation (Dec-Feb) (ln)	3.4148	0.4366
Extended set of controls:		
Distance to railroad (ln)	1.8243	1.1459
Distance to Gulag camps (ln)	4.2487	1.4344
Temperature (June-August)	22.4381	4.3601
Temperature (Dec-Feb)	-3.8851	6.6354
Soil Suitability low inputs (ln)	1.4267	0.2350
Distance to water (ln)	2.1701	0.8998
Ruggedness (ln)	4.3527	0.2715
Soil Suitability high inputs (ln)	1.2133	0.3309
Evacuated enterprise dummy	0.4442	0.4970
Share of Kazakhs in 1939	0.4260	1.7995
Share of Karakalpaki in 1939	0.0009	0.0096
Share employed in industry in 1897	0.1741	0.1172
Observations	2,913	

Table A5: Summary statistics, Municipalities sample

Sample:	Russian municipalities	
	Mean	SD
Main outcomes:		
Per capita municipal budget expenditure	26.75	57.52
Share of expenditures on education	49.74	13.53
Number of schools per 100 people	0.0740	0.0460
Number of schools per 100 pupils	0.6411	0.3483
Preschool attendance rate	0.7033	0.1028
Share of degraded preschool buildings, percentage	12.397	20.252
Main explanatory variables and controls:		
Protestant Deportees (ln)	5.7259	2.2161
Muslim Deportees (ln)	1.1510	2.1522
Other ethnic deportees (ln)	2.5446	2.9791
Total non-ethnic deportations (ln)	3.0091	3.0371
All deportations (ln)	6.7324	1.7773
Share of Protestant deportees	0.6221	0.3638
Share of other ethnic deportees	0.1433	0.2511
Share of non-ethnic deportees	0.1771	0.2760
Other baseline controls:		
Log of 1939 population	13.1505	5.3756
Log of Distance to capital city	15.7309	0.0787
Log of Average winter precipitation	3.1605	0.4732
Log of Average summer precipitation	4.2083	0.2149
Log of population	10.2798	1.0175
Urban municipality	0.1794	0.3837
Observations	6,799	

Table A6: Variance decomposition in 1939 population composition into within and between subnational regions

Variable in 1939 Census	Type	Mean	Std. Dev.	Min	Max
Share of Russians	overall	0.6148	0.3316	0.0082	0.9960
	between regions		0.3070	0.0409	0.9813
	within region		0.1597	-0.1083	1.2639
Share of Uzbeks	overall	0.0675	0.2043	0.0000	0.9519
	between regions		0.2298	0.0000	0.7888
	within region		0.0655	-0.5212	0.5746
Share of Kazakhs	overall	0.0778	0.1813	0.0000	0.8636
	between regions		0.2013	0.0000	0.8240
	within region		0.0802	-0.3504	0.6376
Share of Kyrghiz	overall	0.0274	0.1268	0.0000	0.9763
	between regions		0.1001	0.0000	0.5879
	within region		0.0582	-0.5018	0.5192
Share of Tartars	overall	0.0258	0.0636	0.0000	0.6924
	between regions		0.0666	0.0000	0.5442
	within region		0.0416	-0.2187	0.4507
Share of Turkmen	overall	0.0007	0.0102	0.0000	0.2743
	between regions		0.0193	0.0000	0.1326
	within region		0.0076	-0.0425	0.2317
Share of Tajiks	overall	0.0090	0.0528	0.0000	0.7014
	between regions		0.0658	0.0000	0.4693
	within region		0.0351	-0.4235	0.4778
Share of Karakalpaki	overall	0.0007	0.0123	0.0000	0.3800
	between regions		0.0258	0.0000	0.2304
	within region		0.0074	-0.1489	0.1503
Share of Udmurts	overall	0.0051	0.0470	0.0000	0.7347
	between regions		0.0483	0.0000	0.4322
	within region		0.0203	-0.4151	0.3076
Share of Chuvashs	overall	0.0125	0.0841	0.0000	0.9698
	between regions		0.0698	0.0000	0.6219
	within region		0.0409	-0.6078	0.3604
Share of Koreans	overall	0.0036	0.0190	0.0000	0.2819
	between regions		0.0206	0.0000	0.1417
	within region		0.0147	-0.1366	0.2436

Note: The table presents the regional variance decomposition for the 1939 population in municipalities that were the destinations of ethnic deportations. The mean presented is the overall mean for the sample, and each standard deviation presented is the deviation from this mean. The between-region variance estimates regional-level averages, and then calculates the variance for these means. The within-region variance is the mean standard deviation of the variable of interest for each unit separately. To make the between and within variations comparable, the overall mean is added back to each observation in this calculation.

Table A7: Balance in geography, pre-deportation population size, and composition

	(1)	(2)	(3)
Main explanatory variable:	Share of Protestant deportees		
Sample:	Municipalities with deportations		
PLACEBO OUTCOME VAR:	COEF	SE	N
Panel A. Geographic characteristics and evacuated enterprises			
Distance to water (ln)	0.146	(0.215)	1,074
Distance to railroad (ln)	0.201	(0.234)	1,074
Distance to Gulag (ln)	0.022	(0.158)	1,074
Travel distance to capital city (ln)	0.167**	(0.070)	1,068
Ruggedness	0.912	(1.871)	1,074
Soil Suitability low inputs	-0.140	(0.201)	1,074
Soil Suitability high inputs	-0.070	(0.192)	1,074
Precipitation (June-August) (ln)	-0.062*	(0.036)	1,074
Precipitation (Dec-Feb) (ln)	-0.066**	(0.032)	1,074
Temperature (June-August)	-0.020	(0.328)	1,074
Temperature (Dec-Feb)	-0.482	(0.389)	1,074
Evacuated enterprise dummy	-0.098	(0.070)	1,068
Panel B. Population characteristics, 1939 USSR			
Log of total population, 1939	-0.092	(0.113)	1,068
Share of Chechens, 1939	0.000	(0.000)	1,068
Share of Germans, 1939	0.006	(0.004)	1,068
Share of Russians, 1939	-0.020	(0.025)	1,068
Share of Uzbeks, 1939	-0.018	(0.013)	1,068
Share of Turkmens, 1939	-0.001	(0.001)	1,068
Share of Tajiks, 1939	0.000	(0.004)	1,068
Share of Kazakhs, 1939	0.046**	(0.019)	1,068
Share of Kirghiz, 1939	0.005	(0.013)	1,068
Share of Koreans, 1939	-0.001	(0.003)	1,068
Share of Karakalpaki, 1939	-0.001	(0.000)	1,068
Share of Udmurts, 1939	-0.001	(0.001)	1,068
Share of Tartars, 1939	0.007	(0.007)	1,068
Share of Mariians, 1939	-0.004	(0.003)	1,068
Share of Chuvashs, 1939	0.007*	(0.004)	1,068
Panel C. Population characteristics, 1897 Russian empire			
Population density (sq km) 1897 (ln)	0.035	(0.102)	1,042
Share living in city, 1897	0.005	(0.028)	1,042
Share of Russians, 1897	0.017	(0.032)	1,042
Share of Germans, 1897	0.003	(0.003)	1,042
Labor force participation, 1897	0.008	(0.011)	1,042
Share employed in agriculture, 1897	-0.032	(0.049)	1,042
Share employed in industry, 1897	0.005	(0.020)	1,042
Share employed in services, 1897	-0.004	(0.005)	1,042
Share employed in white collar jobs, 1897	0.002	(0.003)	1,042
Share literate, 1897	0.008	(0.013)	1,042
Share of Muslims, 1897	-0.040	(0.028)	1,042
Share of Orthodox, 1897	0.022	(0.016)	1,042
Share of Protestants, 1897	0.004	(0.003)	1,042
Share of Catholics, 1897	0.001	(0.001)	1,042
Share of Buddhists, 1897	-0.000	(0.002)	1,042
Share of Jews, 1897	0.001	(0.001)	1,042

Note: *** p<0.01, ** p<0.05, * p<0.1. The unit of observation is a municipality with an ethnic deportation. Each row reports results from a separate regression with a different placebo outcome variable. The main explanatory variable is the share of Protestants among deportees. We control for the share of all other ethnic deportee groups (except Muslims) and nonethnic deportees and the log of the total size of deportations. In Panel A and B, we control for region fixed effects. In Panel C, we control for 1897 province fixed effects, which is the analogue of the region in the Russian Empire. We also control for the distance to capital city, and summer and winter precipitation in all regressions with non-geographical outcome variables. The difference in the number of observations comes from the fact that some of the post-WWII municipalities were not part of the Russian Empire, and some were not part of the pre-WWII Soviet Union. Standard errors are robust in Panels A and B and are clustered by Russian Empire counties (*Uezds*) in Panel C.

Table A8: Balance in geography, pre-deportation population size and composition, Levels

	(1)	(2)	(3)	(4)	(5)	(6)
Main explanatory variable:	Protestant deportees (ln)		Muslim deportees (ln)			β(Prot) = β(Musl)
Sample:	Municipalities with deportations					
PLACEBO OUTCOME VAR:	COEF	SE	COEF	SE	N	P-value
Panel A. Geographic characteristics and evacuated enterprises						
Distance to water (ln)	-0.0002	(0.0217)	-0.0267	(0.0239)	1,074	0.459
Distance to railroad (ln)	-0.0992***	(0.0270)	-0.0566**	(0.0264)	1,074	0.302
Distance to Gulag (ln)	-0.0705***	(0.0203)	-0.0504***	(0.0176)	1,074	0.498
Travel distance to capital city (ln)	-0.0034	(0.0070)	-0.0217***	(0.0066)	1,068	0.0773*
Ruggedness	-0.2498	(0.2192)	0.0583	(0.1804)	1,074	0.328
Soil Suitability low inputs	-0.0344	(0.0238)	0.0378*	(0.0203)	1,074	0.0331**
Soil Suitability high inputs	-0.0217	(0.0279)	0.0233	(0.0202)	1,074	0.223
Precipitation (June-August) (ln)	0.0018	(0.0037)	0.0051	(0.0036)	1,074	0.544
Precipitation (Dec-Feb) (ln)	0.0008	(0.0041)	0.0100***	(0.0038)	1,074	0.120
Temperature (June-August)	-0.0565	(0.0377)	0.0029	(0.0352)	1,074	0.271
Temperature (Dec-Feb)	-0.0024	(0.0510)	0.0432	(0.0434)	1,074	0.530
Evacuated enterprise dummy	0.0200***	(0.0067)	0.0192***	(0.0069)	1,068	0.936
Panel B. Population characteristics, 1939 USSR						
Log of total population, 1939	0.05218***	(0.01334)	0.04420***	(0.01348)	1,068	0.686
Share of Chechens, 1939	0.00001	(0.00001)	-0.00000	(0.00000)	1,068	0.179
Share of Germans, 1939	0.00126***	(0.00038)	0.00081**	(0.00036)	1,068	0.388
Share of Russians, 1939	0.00847***	(0.00312)	0.01013***	(0.00292)	1,068	0.702
Share of Uzbeks, 1939	-0.00196	(0.00174)	-0.00068	(0.00102)	1,068	0.553
Share of Turkmens, 1939	-0.00012	(0.00010)	0.00001	(0.00007)	1,068	0.238
Share of Tajiks, 1939	0.00038	(0.00040)	-0.00011	(0.00052)	1,068	0.456
Share of Kazakhs, 1939	-0.00301**	(0.00146)	-0.01290***	(0.00289)	1,068	0.001***
Share of Kirghiz, 1939	-0.00299*	(0.00154)	-0.00302**	(0.00153)	1,068	0.989
Share of Koreans, 1939	-0.00007	(0.00029)	0.00037*	(0.00019)	1,068	0.283
Share of Karakalpaki, 1939	-0.00022	(0.00016)	0.00007	(0.00008)	1,068	0.212
Share of Udmurts, 1939	0.00005	(0.00051)	0.00013	(0.00015)	1,068	0.890
Share of Tartars, 1939	0.00002	(0.00114)	-0.00077	(0.00096)	1,068	0.613
Share of Mariians, 1939	-0.00028*	(0.00016)	-0.00004	(0.00014)	1,068	0.342
Share of Chuvashs, 1939	-0.00077	(0.00097)	-0.00125	(0.00079)	1,068	0.586
Panel C. Population characteristics, 1897 Russian empire						
Population density (sq km), 1897 (ln)	-0.00520	(0.01524)	-0.02131*	(0.01289)	1,042	0.461
Share living in city, 1897	-0.00219	(0.00179)	-0.00633	(0.00432)	1,042	0.413
Share of Russians, 1897	0.00625	(0.00386)	-0.00576	(0.00524)	1,042	0.0666*
Share of Germans, 1897	-0.00012	(0.00020)	-0.00079*	(0.00046)	1,042	0.195
Labor force participation, 1897	0.00090	(0.00086)	-0.00273*	(0.00158)	1,042	0.0587*
Share employed in agriculture, 1897	-0.00180	(0.00360)	0.00977	(0.00710)	1,042	0.161
Share employed in industry, 1897	0.00188	(0.00219)	-0.00154	(0.00218)	1,042	0.224
Share employed in services, 1897	-0.00045	(0.00035)	-0.00069	(0.00071)	1,042	0.784
Share employed in white collar jobs, 1897	0.00002	(0.00016)	-0.00066	(0.00044)	1,042	0.184
Share literate, 1897	0.00068	(0.00092)	-0.00264	(0.00213)	1,042	0.184
Share of Muslims, 1897	0.00110	(0.00169)	0.00888**	(0.00446)	1,042	0.119
Share of Orthodox, 1897	-0.00178	(0.00125)	0.00061	(0.00093)	1,042	0.145
Share of Protestants, 1897	0.00007	(0.00025)	-0.00089*	(0.00050)	1,042	0.110
Share of Catholics, 1897	0.00011*	(0.00007)	-0.00022*	(0.00013)	1,042	0.0535
Share of Buddhists, 1897	-0.00069	(0.00049)	-0.00001	(0.00021)	1,042	0.274
Share of Jews, 1897	0.00010	(0.00008)	-0.00025*	(0.00014)	1,042	0.0525*

Note: *** p<0.01, ** p<0.05, * p<0.1. The unit of observation is a municipality with an ethnic deportation. Each row reports results from a separate regression with a different placebo outcome variable. The main explanatory variables are the log of Protestants and Muslim deportees. We control for the size of all other ethnic deportee groups and nonethnic deportees. In Panel A and B, we control for region fixed effects. In Panel C, we control for 1897 province fixed effects, which is the analogue of the region in the Russian Empire. We also control for the distance to capital city, and summer and winter precipitation in all regressions with non-geographical outcome variables. The difference in the number of observations comes from the fact that some of the post-WWII municipalities were not part of the Russian Empire, and some were not part of the pre-WWII Soviet Union. Standard errors are robust in Panels A and B and are clustered by Russian Empire counties (*Uezds*) in Panel C.

Table A9: The effect on auxiliary outcomes: fertility and educational attainment
Sample: micro data on individuals, 10% of 2010 Russia Census

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable, both panels:	Has children		Age of first child		Higher education		Post-graduate education	
Sample – gender:	Females	Males	Females	Males	Females	Males	Females	Males
Sample – age:	Adults below 30 years old				Adults above 30 years old			
Panel A. The effect of the numbers of Protestant and Muslim deportees								
log(Protestant deportees + 1)	-0.0057**	-0.0021	-0.0115	-0.0109	0.0044	0.0050*	0.0003	0.0004*
	(0.0029)	(0.0017)	(0.0136)	(0.0128)	(0.0030)	(0.0027)	(0.0002)	(0.0002)
log(Muslim deportees + 1)	0.0019	0.0007	-0.0214***	-0.0157*	-0.0010	-0.0015	-0.0001	-0.0002
	(0.0012)	(0.0009)	(0.0077)	(0.0090)	(0.0013)	(0.0012)	(0.0001)	(0.0001)
R-squared	0.235	0.168	0.208	0.207	0.0740	0.0469	0.00365	0.00737
p-value: β(Protestant) = β(Muslim)	0.010***	0.133	0.512	0.752	0.068*	0.017**	0.022**	0.014**
Panel B. The effect of the share of Protestant deportees								
Share of Protestant deportees	-0.0259**	0.0049	0.0706	-0.0145	0.0222**	0.0215*	0.0021***	0.0025***
	(0.0120)	(0.0091)	(0.0700)	(0.0817)	(0.0102)	(0.0112)	(0.0006)	(0.0009)
R-squared	0.235	0.168	0.208	0.207	0.074	0.047	0.004	0.007
Observations	472,868	445,260	193,521	100,670	1,507,255	1,131,450	1,507,255	1,131,450
Mean of dependent var.	0.409	0.226	21.93	23.20	0.232	0.206	0.00427	0.00659
SD of dependent var.	0.492	0.418	2.900	3.130	0.422	0.404	0.0652	0.0809
Region FE, deportation controls	✓	✓	✓	✓	✓	✓	✓	✓
log 1939 pop, Municipality size, respondent's age dummies	✓	✓	✓	✓	✓	✓	✓	✓
Baseline geographic controls	✓	✓	✓	✓	✓	✓	✓	✓

Note: *** p<0.01, ** p<0.05, * p<0.1. The unit of observation is an individual in a municipality with an ethnic deportation. The sample covers Russia only due to Census data limitations. Standard errors are clustered at the municipality level. Panels A and B present the main specifications in levels and shares, respectively. In Panel A, we control for the log numbers of other (non-Protestant and non-Muslim) ethnic deportees and of nonethnic deportees. In Panel B, we control for the share of all non-Protestant and non-Muslim deportees and the log total size of the deportations. All regressions include controls for region fixed effects. Baseline geographic controls are distance to log capital city and precipitation in winter and summer.

Table A10: Regression results corresponding to the visualization presented in Figure 6

	(1)		(2)	(3)
Specification:	The effect of the number of Protestant deportees	**Specification:**	The effect of the share of Protestant deportees	
Dependent variable:	Female respondent completed higher education	**Dependent variable:**	Female respondent completed higher education	Mother of respondent completed higher education
Source of data:	Census 2010, 10% sample	**Source of data:**	Census 2010, 10% sample	Life in Transition Survey
Regressors:		**Regressors:**		
		Birth cohort -2 (before) × ln nb of Protestant deportees		-0.023
				(0.045)
Birth cohort -1 (before) × log(Protestant deportees + 1)	-0.0013	Birth cohort -1 (before) × Share of Protestant deportees	0.0054	0.001
	(0.0030)		(0.0155)	(0.061)
Birth cohort +1 (after) × log(Protestant deportees + 1)	0.0033	Birth cohort +1 (after) × Share of Protestant deportees	0.0354***	0.092**
	(0.0031)		(0.0129)	(0.045)
Birth cohort +2 (after) × log(Protestant deportees + 1)	0.0062**	Birth cohort +2 (after) × Share of Protestant deportees	0.0543***	0.078
	(0.0031)		(0.0112)	(0.049)
Birth cohort +3 (after) × log(Protestant deportees + 1)	0.0045	Birth cohort +3 (after) × Share of Protestant deportees	0.0145	0.098*
	(0.0032)		(0.0102)	(0.058)
Birth cohort +4 (after) × log(Protestant deportees + 1)	0.0062**	Birth cohort +4 (after) × Share of Protestant deportees	0.0197*	
	(0.0031)		(0.0105)	
Birth cohort +5 (after) × log(Protestant deportees + 1)	0.0042	Birth cohort +5 (after) × Share of Protestant deportees	0.0250**	
	(0.0032)		(0.0125)	
Observations	1,507,255		1,507,255	3,352
Region and birth-year FE and baseline controls	✓		✓	✓
Data-source specific controls	✓		✓	✓
Sample	Census, female respondents		Census, female respondents	LiTs, both genders
R-squared	0.074		0.073	0.207
Mean of dependent var.	0.232		0.232	0.148
SD of dependent var.	0.422		0.422	0.355

Note: *** p<0.01, ** p<0.05, * p<0.1. Columns 1, 2, and 3 present results from Panels A, B, and C of Figure 6, respectively.

Table A11: Robustness to the choice of controls: the effect on female leadership in firms

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent variable, both panels:	Female director dummy						
Sample, firms:	All						
Specification:	Baseline	Robustness					
Panel A. The effect of the numbers of Protestant and Muslim deportees							
log(Protestant deportees + 1)	0.0035***	0.0134***	0.0149***	0.0115***	0.0035***	0.0034***	0.0020**
	(0.0009)	(0.0014)	(0.0014)	(0.0012)	(0.0009)	(0.0010)	(0.0009)
log(Muslim deportees + 1)	-0.0005	-0.0108***	-0.0080***	-0.0075***	-0.0007	-0.0007	-0.0012
	(0.0010)	(0.0020)	(0.0019)	(0.0017)	(0.0010)	(0.0010)	(0.0010)
R-squared	0.0938	0.0220	0.0597	0.0902	0.0942	0.0942	0.0933
p-value: β(Protestant) = β(Muslim)	0.007***	0.000***	0.000***	0.088*	0.005***	0.006***	0.027**
Panel B. The effect of the share of Protestant deportees							
Share of Protestant deportees	0.0288***	0.1714***	0.1850***	0.1453***	0.0189*	0.0203*	0.0221**
	(0.0097)	(0.0358)	(0.0340)	(0.0270)	(0.0109)	(0.0109)	(0.0092)
R-squared	0.0937	0.0191	0.0564	0.0884	0.0940	0.0940	0.0933
Oster's delta	0.239	0.410	33.54	7.054	0.143	0.150	0.140
Observations	1,271,415	1,679,789	1,271,738	1,271,738	1,271,415	1,271,415	1,240,072
Mean of dependent var.	0.298	0.319	0.298	0.298	0.298	0.298	0.301
SD of dependent var.	0.457	0.466	0.457	0.457	0.457	0.457	0.459
Region FE, deportation controls	✓	✓	✓	✓	✓	✓	✓
Industry FE	✓		✓	✓	✓	✓	✓
Company controls	✓			✓	✓	✓	✓
Baseline geographic controls	✓				✓	✓	✓
Extended geographic controls					✓	✓	✓
Number of firms in municipality						✓	✓
FLFP in 1897							✓

Note: *** p<0.01, ** p<0.05, * p<0.1. Panel A presents our main specification in levels. In Panel A, all regressions control for the size of all other deportee groups and a dummy for a deportation in the municipality. Panel B presents the specification in shares. In Panel B, all regressions control for the share of all other deportee groups (excluding Muslims) and the total size of deportations. In Panel B, the sample is further restricted to municipalities with a deportation. All regressions are conditional on region fixed effects. Standard errors are clustered at the municipality level. Other controls are: **Industry FE:** industry group dummy of companies. **Baseline geographic controls:** distance to the capital city, average long-run precipitation in winter and in summer, and log municipal population in 1939. **Company controls:** size category of the company and the number of directors in the company. **Extended geographic controls:** distance to the closest railroad, water, and Gulag camp, ruggedness, soil suitability for high and low inputs, and average long-run precipitation in winter and in summer.

Table A12: Robustness to using different clusters
The effect of the share of Protestant deportees (Census and Orbis)

	(1)	(2)
Dependent variable:	LFP, females	Female director
Source of data:	2010 Census	Orbis
Panel A. Full baseline samples		
Coefficient: Share of Protestant deportees	0.0246	0.0288
SEs: clustered by municipality (baseline)	(0.0093)***	(0.0097)***
SEs: clustered by region	(0.0103)**	(0.0130)**
R-squared	0.153	0.094
Observations	1,454,153 (individuals)	1,271,415 (firms)
Panel B. 10% random draw from the full baseline samples		
Coefficient: Share of Protestant deportees	0.0282	0.0290
SEs: clustered by municipality	(0.0109)***	(0.0121)**
SEs: Conley, 150km radius	(0.0113)**	(0.0129)**
SEs: Conley, 200km radius	(0.0111)**	(0.0116)**
R-squared	0.154	0.095
Observations	145,413 (individuals)	126,992 (firms)
Panel C. Municipality-level regressions		
Coefficient: Share of Protestant deportees	0.0173	0.0236
SEs: robust	(0.0104)*	(0.0141)*
R-squared	0.420	0.689
Observations	541 (municipalities)	870 (municipalities)

Note: *** p<0.01, ** p<0.05, * p<0.1. The table presents robustness of the main results with respect to changing assumptions about the variance-covariance matrix. The top 2 rows of Panel A restate the main results from Column 3 of Panel B of Table 2 and from Column 1 of Panel B of Table 3. In the 3rd row of Panel A, we use the same samples and specifications, but cluster error terms at the regional rather than municipality level. In the top two rows of Panel B, we reestimate the same specification as baseline, but on a 10% random sample of the baseline sample. The reason to do this is to create the benchmark for the Conley-correction, as we do not have enough computing power to calculate spatial-correlation-adjusted standard errors on the full sample. In the next row, we report Conley-adjusted standard errors with radius of 150 km. In Panel C, we report results for the samples collapsed to the municipality level.

Table A13: Balance in geography, pre-deportation population size and composition: sample of Life in Transition Survey localities (PSUs)

	(1)	(2)	(3)
Main explanatory variable:	Share of Protestant deportees		
Sample:	PSUs with deportations from LiTS		
PLACEBO OUTCOME VAR:	COEF	SE	N
Panel A. Geographic characteristics and evacuated enterprises			
Distance to water (ln)	0.432	(0.267)	235
Distance to railroad (ln)	0.250	(0.342)	235
Distance to Gulag (ln)	0.005	(0.428)	235
Travel distance to capital city (ln)	-0.177	(0.372)	235
Ruggedness	1.403	(3.728)	235
Soil Suitability low inputs	-0.519*	(0.269)	235
Soil Suitability high inputs	-0.114	(0.310)	235
Precipitation (June-August) (ln)	-0.046	(0.132)	235
Precipitation (Dec-Feb) (ln)	0.002	(0.134)	235
Temperature (June-August)	-1.762*	(1.030)	235
Temperature (Dec-Feb)	-2.159**	(1.050)	235
Evacuated enterprise dummy	-0.263	(0.168)	235
Panel B. Population characteristics, 1939 USSR			
log of 1939 population, 1939	-0.068	(0.651)	235
Share of Chechens, 1939	0.003	(0.003)	235
Share of Germans, 1939	0.001	(0.015)	235
Share of Russians, 1939	0.043	(0.180)	235
Share of Uzbeks	-0.038	(0.072)	235
Share of Turkmens, 1939	-0.001	(0.001)	235
Share of Tajiks, 1939	0.039	(0.033)	235
Share of Kazakhs, 1939	0.789	(0.638)	235
Share of Kirghiz, 1939	0.028	(0.156)	235
Share of Koreans, 1939	-0.007	(0.016)	235
Share of Karakalpaki, 1939	-0.001	(0.002)	235
Share of Udmurts, 1939	0.003	(0.003)	235
Share of Tartars, 1939	0.006	(0.010)	235
Share of Mariians, 1939	-0.000*	(0.000)	235
Share of Chuvashs, 1939	-0.005	(0.005)	235
Panel C. Population characteristics, 1897 Russian empire			
Population density (sq km) 1897 (ln)	-0.065	(0.407)	198
Share living in city, 1897	-0.039	(0.047)	198
Share of Russians, 1897	0.022	(0.080)	198
Share of Germans, 1897	0.001	(0.001)	198
Labor force participation, 1897	-0.032	(0.029)	198
Share employed in agriculture, 1897	0.093	(0.088)	198
Share employed in industry, 1897	-0.072	(0.065)	198
Share employed in services, 1897	-0.006	(0.010)	198
Share employed in white collar jobs, 1897	0.000	(0.003)	198
Share literate, 1897	-0.017	(0.017)	198
Share of Muslims, 1897	-0.019	(0.073)	198
Share of Orthodox, 1897	0.002	(0.010)	198
Share of Protestants, 1897	0.001	(0.001)	198
Share of Catholics, 1897	-0.000	(0.001)	198
Share of Buddhists, 1897	-0.004	(0.003)	198
Share of Jews, 1897	-0.000	(0.001)	198

Note: *** p<0.01, ** p<0.05, * p<0.1. The unit of observation is a LiTS PSU with an ethnic deportation. Each row reports results from a separate regression with a different placebo outcome variable. The main explanatory variable is the share of Protestants among deportees. We control for the shares of all other ethnic deportee groups (except Muslims) and nonethnic deportees and the log of the total size of deportations. In Panel A and B, we control for region fixed effects. In Panel C, we control for 1897 province fixed effects, which is the analogue of the region in the Russian Empire. We also control for the distance to capital city, and summer and winter precipitation in all regressions with non-geographical outcome variables. The difference in the number of observations comes from the fact that some of the post-WWII municipalities were not part of the Russian Empire, and some were not part of the pre-WWII Soviet Union. Standard errors are robust in Panels A and B and are clustered by Russian Empire counties (*Uezds*) in Panel C.

Table A14: The effect on auxiliary outcomes in LiTS: Tried to start a business, fertility, and education

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable, both panels:	Respondent's parent has higher education		Tried to start a business		Respondent has a child	
Sample, gender:	Mother	Father	Female	Male	Female	Male
Panel A. The effect of the numbers of Protestant and Muslim deportees						
log(Protestant deportees + 1)	0.003	0.014***	0.012*	-0.008*	-0.022**	-0.015***
	(0.005)	(0.005)	(0.007)	(0.005)	(0.009)	(0.005)
log(Muslim deportees + 1)	-0.007	-0.007	-0.011	0.011	0.022**	0.007
	(0.009)	(0.008)	(0.007)	(0.013)	(0.011)	(0.014)
R-squared	0.215	0.174	0.0745	0.0939	0.116	0.191
p-value: β(Protestant) = β(Muslim)	0.330	0.007***	0.035**	0.169	0.007***	0.116
Panel B. The effect of the share of Protestant deportees						
Share of Protestant deportees	0.116**	0.135***	0.122**	-0.090	-0.148*	-0.105
	(0.058)	(0.039)	(0.058)	(0.078)	(0.084)	(0.087)
R-squared	0.219	0.175	0.0807	0.0898	0.114	0.193
Oster's delta	-1.130	-1.598	-16.425	23.030	-1.336	25.494
Observations	2,363	2,337	1,688	1,271	1,688	1,271
Mean of dependent var.	0.169	0.229	0.116	0.206	0.517	0.551
SD of dependent var.	0.374	0.420	0.320	0.405	0.500	0.498
Region FE and controls	✓	✓	✓	✓	✓	✓

Note: *** p<0.01, ** p<0.05, * p<0.1. Panel A presents our main specification in levels. In Panel A, all regressions control for the size of all other deportee groups. Panel B presents the specification in shares. In Panel B, all regressions control for the shares of other deportee groups (excluding Muslims) and the total size of deportations. In both panels, the sample is restricted to representatives of the majority group in each country, and to PSUs within 30km of a deportation. In Columns 1 and 2, the samples is further restricted to respondents whose mother went to school after WWII. All regressions are conditional on religious group dummies and region fixed effects and on a set of individual controls (age, education and log of income) and geographic controls (the log of 1939 population, distance to the capital city, past/current capital and current urban status, soil suitability for low inputs, and average long-run precipitation and temperature in summer and winter). Standard errors are corrected for spatial correlation within a 150km radius following Conley (1999).

Table A15: Attitudes toward the role of women by gender
Sample: respondents of the Life in Transition Survey in Russia and Central Asia

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable, both panels:	Chose to disagree or strongly disagree (on 4-point Likert scale) with the statement:						1st Principal Component	
	A woman should always do most of the household chores		It is better if the man earns the money in the family		Men make better political leaders than women do		Pro-gender-equality attitudes Normalized b/w 0 and 1	
Sample, gender:	Females	Males	Females	Males	Females	Males	Females	Males
Panel A. The effect of the numbers of Protestant and Muslim deportees								
log(Protestant deportees + 1)	0.039***	0.024***	0.017**	0.030***	0.022	0.018*	0.027***	0.025***
	(0.003)	(0.006)	(0.008)	(0.007)	(0.015)	(0.010)	(0.004)	(0.005)
log(Muslim deportees + 1)	0.002	-0.008	-0.008	-0.014*	-0.028**	-0.007	-0.011	-0.010
	(0.009)	(0.010)	(0.011)	(0.007)	(0.012)	(0.010)	(0.009)	(0.007)
R-squared	0.219	0.173	0.123	0.140	0.174	0.131	0.196	0.175
p-value: β(Protestant) = β(Muslim)	0.00***	0.00***	0.06*	0.00***	0.02***	0.08*	0.00***	0.00***
Panel B. The effect of the share of Protestant deportees								
Share of Protestant deportees	0.182***	0.222***	0.148***	0.210**	0.196**	0.086	0.168***	0.178***
	(0.039)	(0.063)	(0.053)	(0.091)	(0.099)	(0.074)	(0.043)	(0.058)
R-squared	0.212	0.176	0.129	0.140	0.176	0.131	0.196	0.176
Oster's delta	2.233	1.948	-1.236	-10.930	1.802	1.827	-7.061	2.610
Observations	1,662	1,251	1,654	1,250	1,639	1,231	1,616	1,206
Mean of dependent var.	0.148	0.158	0.202	0.155	0.234	0.185	0.195	0.163
SD of dependent var.	0.355	0.365	0.402	0.362	0.423	0.388	0.279	0.260
Region FE and controls	✓	✓	✓	✓	✓	✓	✓	✓
Baseline controls	✓	✓	✓	✓	✓	✓	✓	✓
Additional LiTS controls	✓	✓	✓	✓	✓	✓	✓	✓

Note: *** p<0.01, ** p<0.05, * p<0.1. Panel A presents our main specification in levels. In Panel A, all regressions control for the size of all other deportee groups. Panel B presents the specification in shares. In Panel B, all regressions control for the share of all other deportee groups (excluding Muslims) and the total size of deportations. In both panels, the sample is restricted to representatives of the majority group in each country, and to PSUs within 30km of a deportation. All regressions are conditional on religious group dummies and region fixed effects and on a set of individual controls (age, education and log of income) and geographic controls (the log of 1939 population, distance to the capital city, past/current capital and current urban status, soil suitability for low inputs, and average long-run precipitation and temperature in summer and winter). Standard errors are corrected for spatial correlation within a 150km radius following Conley (1999). The dependent variable in columns (7) and (8) is the first principal component of questions used in Columns 1 to 6, normalized to a range between 0 and 1.

Table A16: Robustness to the choice of controls, specification in levels and shares

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable, both panels:	1st Principal Component of Pro-gender-equality Attitudes							
Sample:	All respondents, both genders							
Specification:	Baseline	Robustness						
Panel A. The effect of the numbers of Protestant and Muslim deportees								
log(Protestant deportees + 1)	0.023***	0.025***	0.023***	0.023***	0.023***	0.024***	0.025***	0.025***
	(0.004)	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
log(Muslim deportees + 1)	-0.009	-0.006	-0.007	-0.010	-0.010	-0.011	-0.009	-0.011
	(0.008)	(0.007)	(0.007)	(0.007)	(0.007)	(0.008)	(0.009)	(0.009)
R-squared	0.164	0.130	0.130	0.139	0.142	0.143	0.180	0.180
p-value: β(Protestant) = β(Muslim)	0.0002***	0.000***	0.0001***	0.000***	0.000***	0.000***	0.000***	0.000***
Panel B. The effect of the share of Protestant deportees								
Share of Protestant deportees	0.154***	0.111**	0.122***	0.145***	0.148***	0.149***	0.167***	0.171***
	(0.040)	(0.049)	(0.038)	(0.038)	(0.037)	(0.040)	(0.047)	(0.047)
R-squared	0.166	0.119	0.125	0.138	0.141	0.142	0.178	0.180
Oster's delta	46.529		1.879	-24.868	-13.370	-92.400	19.263	12.226
Observations	2,822	3,262	3,262	3,262	3,262	3,262	2,340	2,242
Mean of dependent var.	0.181	0.181	0.181	0.181	0.181	0.181	0.181	0.181
SD of dependent var.	0.271	0.271	0.271	0.271	0.271	0.271	0.271	0.271
Region FE	✓	✓	✓	✓	✓	✓	✓	✓
Deportee controls	✓		✓	✓	✓	✓	✓	✓
Locality controls	✓			✓	✓	✓	✓	✓
Demographic controls	✓				✓	✓	✓	✓
Extended locality controls	✓					✓	✓	✓
Socio-economic controls	✓						✓	✓
Extended set of historical controls							✓	✓
Parental education controls								✓

Note: *** p<0.01, ** p<0.05, * p<0.1. The table presents specification 1, in levels. In Panel A, the outcome is the 1st principal component of pro-gender-equality attitudes. The sample is restricted to representatives of the majority group in each country in both panels.Standard errors are corrected for spatial correlation within a 150km radius following Conley (1999). All regressions control for region fixed effects. **Deportee controls:** the size (or share) of all other deportee groups, excluding Protestant and Muslim deportees. **Locality controls:** the log of 1939 population, distance to the capital city, past/current capital and current urban status, soil suitability for low inputs, and average long-run precipitation and temperature in summer and winter. **Demographic controls:** age, sex, and religious group of respondent. **Extended locality controls:** distance to railroad, water, and Gulag camps, ruggedness and soil suitability for high inputs. **Socio-economic controls:** log of income and education of respondent. **Extended set of historical controls:** dummy for evacuated enterprise in 1941, the 1939 shares of Kazakhs and Karakalpaki, female labor force participation in 1897, and the share employed in industry in 1897. **Parental education controls:** the highest level of education achieved by the mother and the father.

Table A17: Robustness to using different clusters
The effect of the share of Protestant deportees (LiTS)

	(1) 1st Principal Component Progressive attitudes normalized b/w 0 and 1
Panel A. LiTS sample, individual respondents	
The share of Protestant deportees	0.154
SEs: Conley, 150km radius, baseline	(0.040)***
SEs: Conley, 200km radius	(0.032)***
SEs: clustered by PSU	(0.046)***
SEs: clustered by region	(0.036)***
Sample: gender	Both
Observations	2,822
R-squared	0.166
Panel B. LiTS sample, PSUs	
The share of Protestant deportees	0.145
SEs: Conley, 150km radius	(0.046)***
Observations	227
R-squared	0.482
Region FE and Controls	✓

Note: *** p<0.01, ** p<0.05, * p<0.1. Panel A presents our main specification in levels. All regressions control for the size of all other deportee groups. Panel B presents the specification in shares. All regressions control for the share of all other deportee groups (excluding Muslims) and the total size of deportations. In both panels, the sample is restricted to representatives of the majority group in each country, and in Panel B the sample is further restricted to PSUs within 30km of a deportation. All regressions are conditional on religious group dummies and region fixed effects and on a set of individual controls (age, education, and log of income) and geographic controls (log of 1939 population, distance to the closest railroad, capital city, water, and Gulag camp, past/current capital and current urban status, ruggedness, soil suitability for high and low inputs, and average long-run precipitation and temperature in summer and winter).

Table A18: Pairwise correlations among the measures of gender attitudes (LiTS)

Statement:	Disagree with: Woman should always do most of the household chores	Disagree with: It is better for everyone if the man earns the money in the family	Disagree with: Men make better political leaders than women	Agree with: Women are as competent as men to be business executives
Disagree with: Woman should always do most of the household chores	1			
Disagree with: It is better for everyone if the man earns the money in the family	0.1866 (0.000)***	1		
Disagree with: Men make better political leaders than women	0.1288 (0.000)***	0.2218 (0.000)***	1	
Agree with: Women are as competent as men to be business executives	-0.1128 (0.000)***	-0.0219 (0.065)*	-0.0680 (0.000)***	1

Note: *** p<0.01, ** p<0.05, * p<0.1. The table presents pairwise correlations between alternative measures of gender attitudes in LiTS. P-values are in parentheses.

Table A19: Within-region variation in the data: 2010 census data

2010 Census baseline sample					
Number of observations (respondents)	2,744,284				
Number of female respondents	1,454,153				
Number of regions	41				
Number of municipalities	543				
	Mean	Std. dev.	Median	Min	Max
Number of municipalities per region	18.390	10.77	16	1	50
Number of respondents per municipality	34,280	32,645	24,156	265	105,654
Number of female respondents per municipality	18,708.25	17,614.79	13,106	135	57,080
Treatment variables:	Type	Mean	Std. dev.	Min	Max
log(Protestant deportees + 1)	overall	6.468	2.167	0	10.044
	between regions		2.021	0.313	8.993
	within region		1.351	-0.494	12.444
log(Muslim deportees + 1)	overall	2.167	2.685	0	8.171
	between regions		1.955	0	6.086
	within region		1.315	-3.918	8.224
Share of Protestant deportees	overall	0.612	0.339	0	1
	between regions		0.320	0.004	1
	within region		0.184	-0.283	1.473
Outcome variables:	Type	Mean	Std. dev.	Min	Max
LFP if respondent is female	overall	0.741	0.438	0	1
	between regions		0.024	0.693	0.800
	within region		0.438	-0.058	1.048
LFP if respondent is male	overall	0.843	0.363	0	1
	between regions		0.016	0.810	0.869
	within region		0.363	-0.026	1.033
Higher education attainment if respondent is female	overall	0.276	0.447	0	1
	between regions		0.058	0.140	0.385
	within region		0.445	-0.109	1.136
Higher education attainment if respondent is male	overall	0.200	0.400	0	1
	between regions		0.051	0.088	0.314
	within region		0.398	-0.114	1.111

Note: The table presents basic statistics about the 2010 census baseline sample and presents the variance decomposition into between and within region for the main treatment and outcome variables.

Table A20: Within-region variation in the data: Orbis firms data

Orbis baseline sample:					
Number of observations (firms)	1,271,415				
Number of regions	50				
Number of municipalities	873				
	Mean	Std. dev.	Median	Min	Max
Number of municipalities per region	20.550	14.345	15	1	54
Number of firms per municipality	41995.170	47011.89	14837	1	119929
Treatment variables:	Type	Mean	Std. dev.	Min	Max
log(Protestant deportees + 1)	overall	5.405	2.937	0	10.044
	between regions		2.308	0	9.120
	within region		2.039	-2.662	11.930
log(Muslim deportees + 1)	overall	5.320	3.493	0	9.861
	between regions		3.163	0	8.427
	within region		1.290	-2.504	13.209
Share of Protestant deportees	overall	0.357	0.354	0	1
	between regions		0.348	0	1
	within region		0.173	-0.515	1.277
Outcome variables:	Type	Mean	Std. dev.	Min	Max
Dummy for female company director	overall	0.298	0.457	0	1
	between regions		0.053	0.183	0.438
	within region		0.454	-0.140	1.115
Share of females among company directors	overall	0.259	0.418	0	1
	between regions		0.045	0.168	0.396
	within region		0.416	-0.137	1.091

Note: The table presents basic statistics about the Orbis sample and presents the variance decomposition into between and within region for the main treatment and outcome variables.

Table A21: Within-region variation in the data: LiTS survey

LiTS baseline sample (members of the majority group in each country):					
Number of observations (respondents)	3,425				
Number of regions	35				
Number of PSUs	230				
	Mean	Std. dev.	Median	Min	Max
Number of PSUs per region	10.799	5.632	11	1	22
Number of respondents per PSU	17.326	4.148	19	1	23
Treatment variables:	Type	Mean	Std. dev.	Min	Max
log(Protestant deportees + 1)	overall	5.630	2.735	0	10.009
	between regions		2.180	0	8.728
	within region		1.407	0.347	12.092
log(Muslim deportees + 1)	overall	6.856	2.734	0	10.118
	between regions		2.564	0	9.448
	within region		1.255	0.992	11.389
Share of Protestant deportees	overall	0.329	0.353	0	1
	between regions		0.286	0	0.962
	within region		0.161	-0.142	0.921
Outcome variables:	Type	Mean	Std. dev.	Min	Max
Disagree with:					
A woman should always do	overall	0.152	0.359	0	1
most of the household chores	between regions		0.150	0	0.571
	within region		0.334	-0.419	1.135
Disagree with:					
It is better if the man earns	overall	0.182	0.386	0	1
the money in the family	between regions		0.147	0.048	0.593
	within region		0.371	-0.411	1.133
Disagree with:					
Men make better political	overall	0.213	0.409	0	1
leaders than women do	between regions		0.171	0.048	0.750
	within region		0.389	-0.537	1.164

Note: The table presents basic statistics about the LiTS sample and presents the variance decomposition into between and within region for the main treatment and outcome variables.

Figure A1: Deportees on the road to their destination and at work at their destination

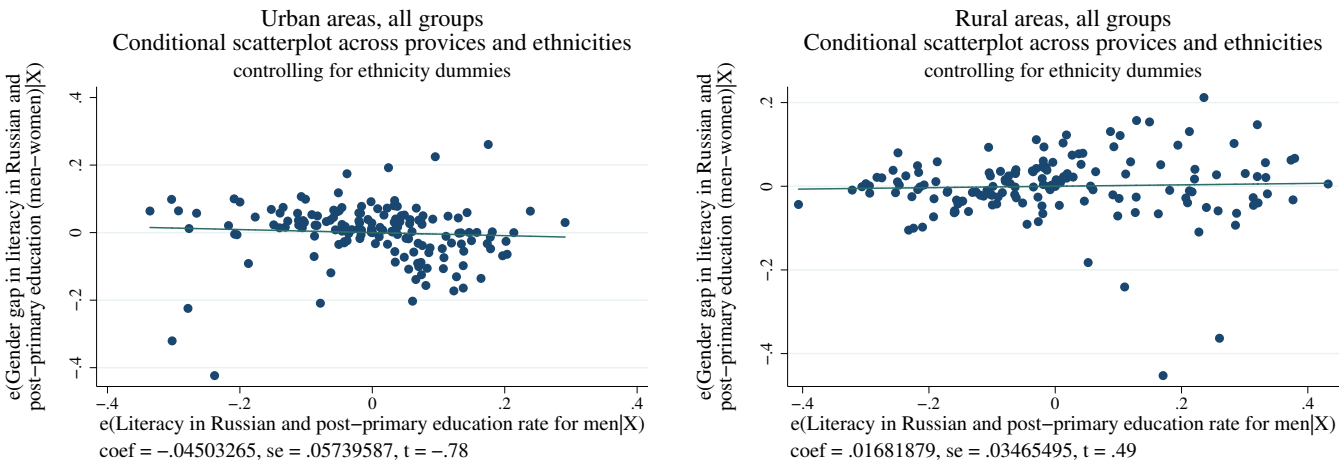
(a) Chechen deportees on the road to their destination

(b) Volga German deportees at work in Siberia

Note: Copyright for Panel (a): Wikimedia Commons; for Panel (b): Alamy (www.alamy.com).

Figure A2: Gender gap in education and the level of education across the Russian empire provinces and ethnic groups

(a) **(b)**



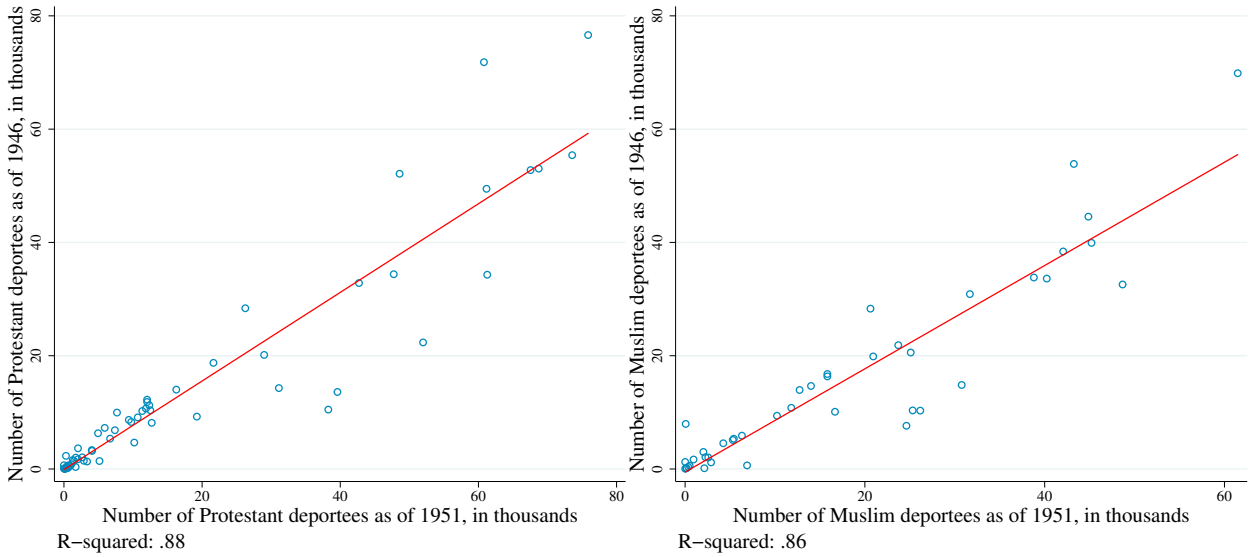
Note: The figure presents scatterplots of literacy in Russian and post-primary education gender gap for Germans, Chechens, Crimean Tatars, Meskhetian Turks, Russians and Central Asian ethnicities as a function of the male literacy in Russian and post-primary education rate across provinces conditional on ethnicity fixed effects. Figures (a) and (b) presents the results for urban and rural areas, respectively. The sample is restricted to provinces with at least 200 individuals in each ethnicity.

Figure A3: Check on the deportations data, subnational-region level

(a) 1951 Deportation census vs. 1946 Deportation census

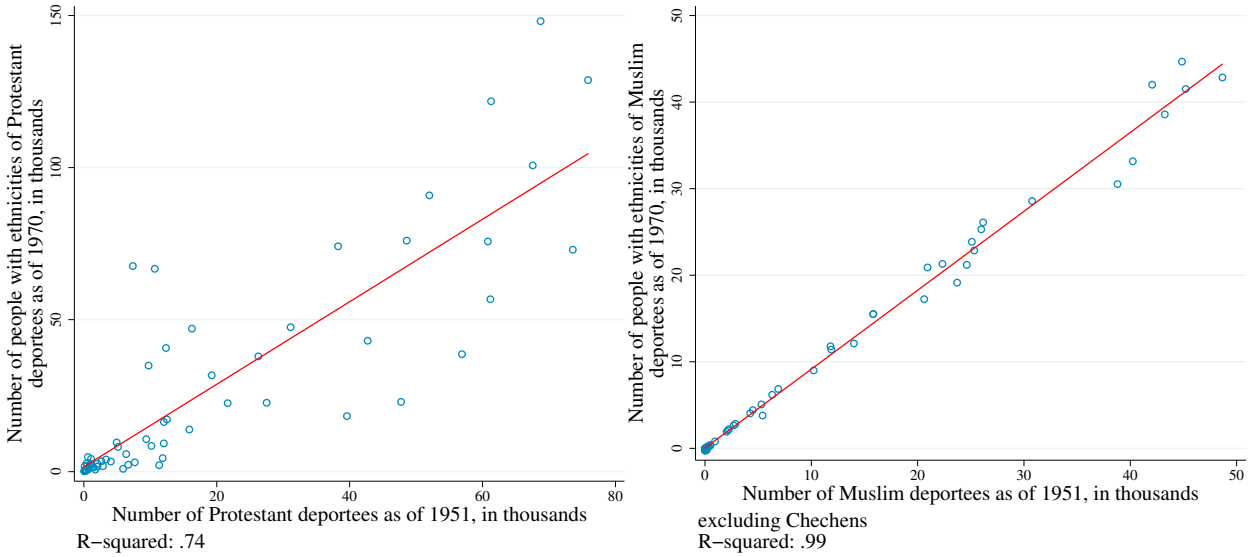
Protestant deportees (left) and Muslim deportees (right)

dy



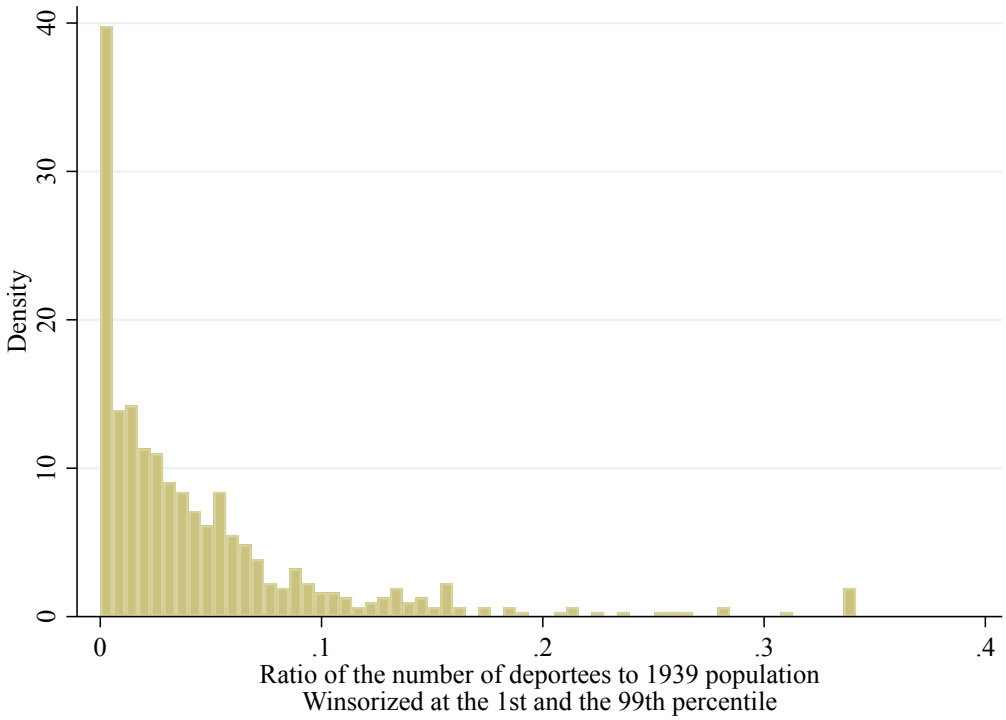
(b) 1951 Deportation census vs. 1970 USSR Census

Deportee groups in 1951 excluding Chechens who left in the 1960s vs.
people of the same ethnicities in 1970
Protestants (left) and Muslims excluding Chechens (right)



Note: Panel A presents scatter plots of the size of the deported groups by region in 1946 and 1951 NKVD Deportation censuses, separately for Protestant and Muslim deportees. Panel B presents scatter plots of the size of the deported groups by region in the 1970 Soviet Census plotted against the size of Protestant and Muslim deportations by region in the 1951 NKVD Deportation census. In Panel B, the group of Muslim deportees excludes Chechens because the majority of Chechen deportees left the deportation locations by 1970. The unit of measurement is 1,000 people.

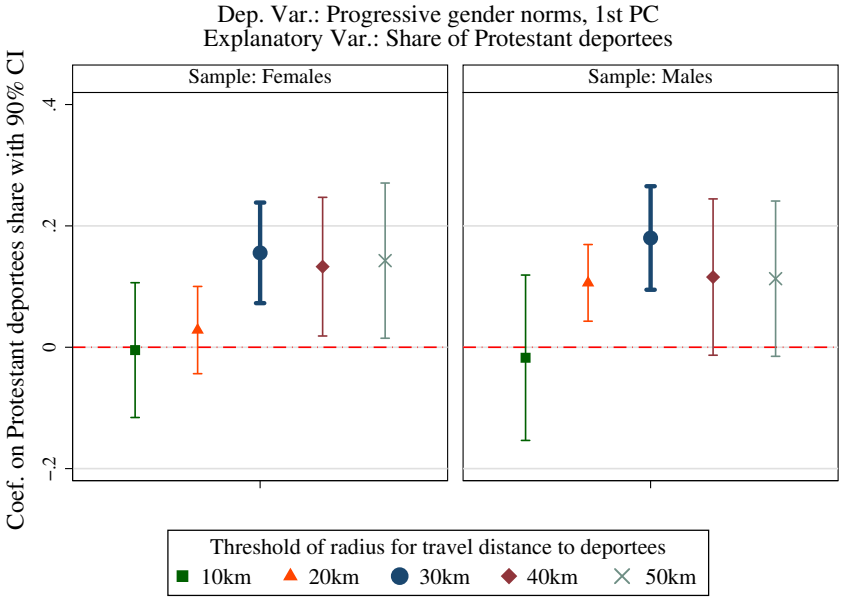
Figure A4: Distribution of the ratio of the number of deportations to the local population in 1939



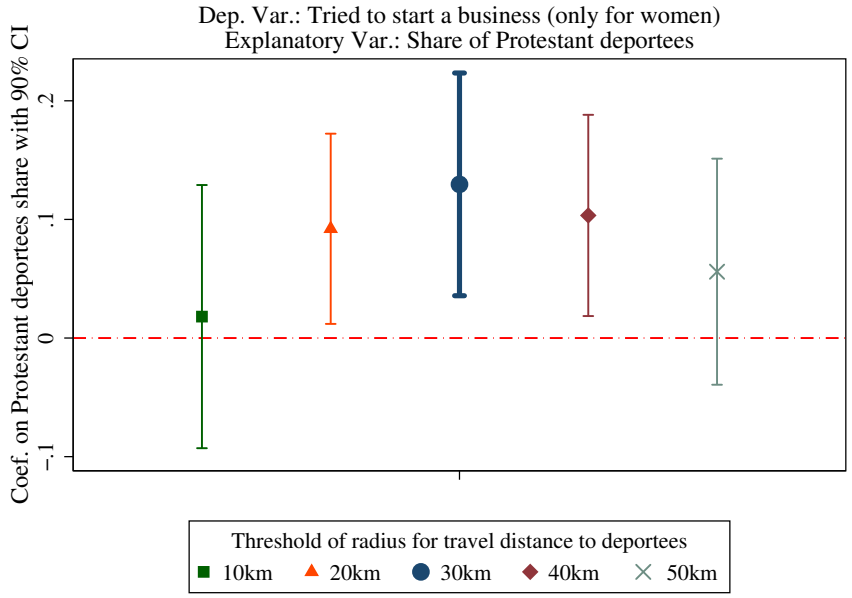
Note: The figure presents the distribution of the ratio of Protestant and Muslim deportees to the pre-war population in 1939 across municipalities. The sample is restricted to municipalities in Russia that were destinations of deportations. The data are winsorized at the 1st and the 99th percentile. In the full sample, the maximum is 1.7.

Figure A5: Robustness of the effect of the share of Protestant deportees to using different thresholds for travel distance to deportees

(a) The effect on gender attitudes



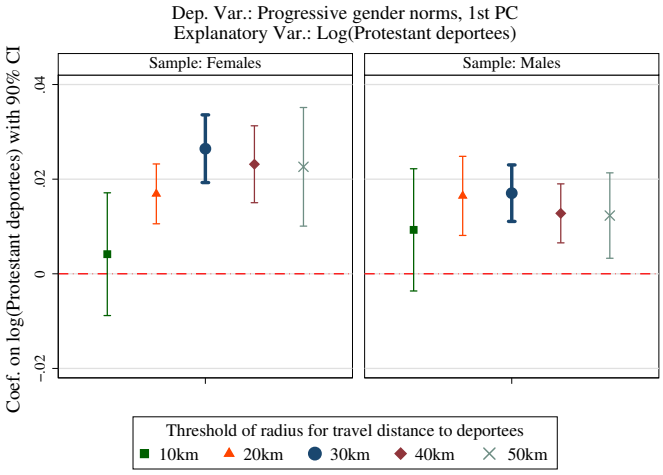
(b) The effect on entrepreneurship among women



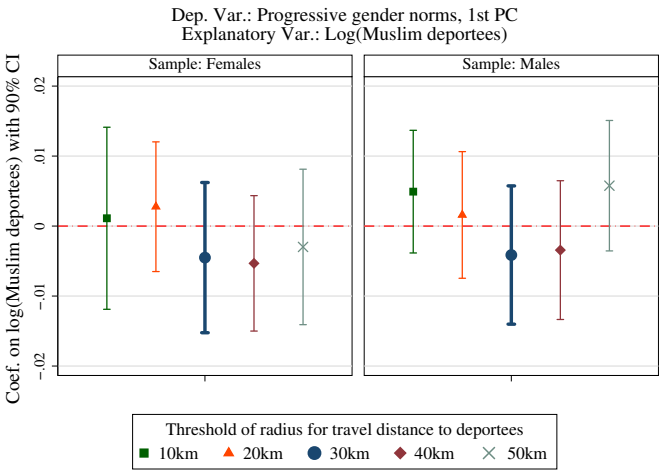
Note: The figure presents the effect of the share of Protestant deportees on the 1st Principal Component of pro-gender-equality attitudes (Panel A), separately for males and females, and on a dummy for having tried to start a business, among female respondents (Panel B). The coefficients and 90% confidence intervals displayed are from OLS regressions that control for the share of all other deportee groups (excluding Muslims) and the total size of deportations at various distance thresholds (N=10km, 20km, 30km, 40km or 50km). The sample is restricted to representatives of the majority group in each country residing in a PSU within N km of a deportation. In both panels, all regressions are conditional on religious group dummies and region fixed effects. The regressions also include a set of individual controls (age, education and log of income) and geographic controls (log of 1939 population, distance to the closest railroad, capital city, water, and Gulag camp, past/current capital and current urban status, ruggedness, soil suitability for high and low inputs, and average long-run precipitation and temperature in summer and winter). Standard errors are corrected for spatial correlation within a 150km radius following Conley (1999).

Figure A6: Robustness of the effect of the number of Protestant and Muslim deportees to using different thresholds for travel distance to deportees

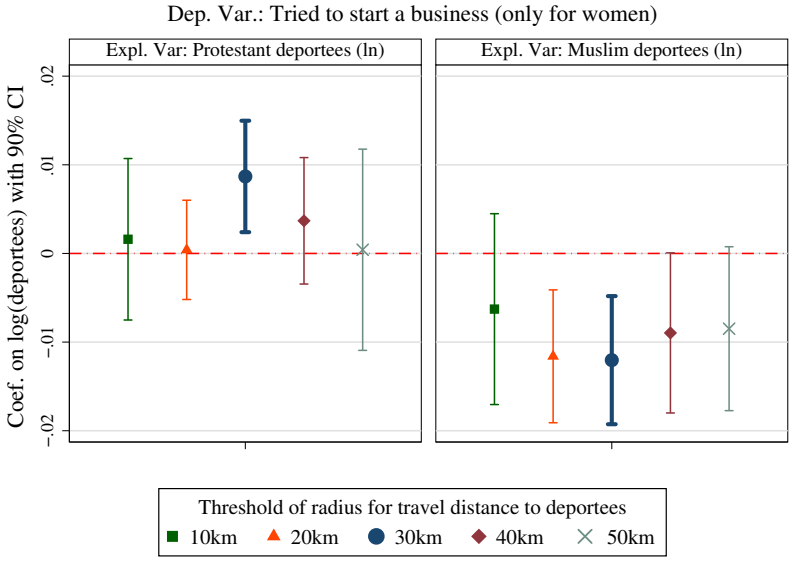
(a) The effect on gender attitudes of Protestant deportees



(b) The effect on gender attitudes of Muslim deportees



(c) The effect on entrepreneurship among women of Protestant and Muslim deportees



Note: The figure presents the effect of the level of Protestant deportees and Muslim deportees on the 1st Principal Component of pro-gender-equality attitudes (Panels A and B), separately for males and females, and on a dummy for having tried to start a business, among female respondents (Panel C). The coefficients and 90% confidence intervals displayed are from OLS regressions that control for the size of all other deportee groups and a dummy for a Protestant or Muslim deportation at various distance thresholds (N=10km, 20km, 30km, 40km or 50km). The sample is restricted to representatives of the majority group in each country residing in a PSU within N km of a deportation. All regressions are conditional on religious group dummies and region fixed effects. The regressions also control for a set of individual controls (age, education and log of income) and geographic controls (log of 1939 population, distance to the closest railroad, capital city, water, and Gulag camp, past/current capital and current urban status, ruggedness, soil suitability for high and low inputs, and average long-run precipitation and temperature in summer and winter). Standard errors are corrected for spatial correlation within a 150km radius following Conley (1999).

B Anecdotal Evidence on Gender Norms Among Deportees and Natives

B.1 Official Soviet policy

Gender equality was the official policy of the USSR. Proclaimed part of the Soviet ideology, it encompassed the spheres of education, work and family. Polygamy, child marriage, and wearing the veil were forbidden throughout the USSR. Campaigns for "the liquidation of illiteracy" (*Likbez*) of the 1920s and 1930s targeted equally men and women. Boys and girls had the same schooling obligations (e.g., Clark, 1995).

Atheism, as with gender equality, was proclaimed one of the ideological goals of the revolution. Initially, the Soviet state allowed some religious freedom for Muslims in contrast to Orthodox Christians and Protestants (as the state was not able to cope with resistances on several fronts), but this policy was overturned in 1927. At this point, all religious expression was officially forbidden until 1941, and brutal anti-religious campaigns in the 1930s cracked down on all religious denominations (Pospielovsky, 1988).

Soviet ideological goals, however, were not equally enforced everywhere. The differences in resistance to forced gender equality and forced secularization were stark among different ethnic groups of the USSR.

B.2 Anthropological and historical evidence on gender norms among deportees and native population of deportation locations

Soviet Germans held the most equitable gender norms not only among deported ethnic groups, but also among all groups residing in the Soviet Union. They were the descendants of Germans, who immigrated to Russia in the late 18th century and settled mostly in the Volga region on the invitation of Catherine the Great.[29] In the Russian empire, Germans were granted unprecedented freedoms. Their culture and religion were tolerated, and they were exempt from military service and serfdom (Miller, 1987). According to the 1897 Imperial Census, 81% of Volga Germans were Protestants. Historians point out that Volga Germans instituted schools for girls as early as the 18th century (Wiens, 1997; Dietz, 2005).

After the revolution, Volga Germans continued to enjoy a special degree of autonomy, which since 1924, took the form of their own administrative region, the Volga German Autonomous Soviet Socialist Republic. Soviet Germans considered themselves

[29] Most Germans who came to the Russian empire were from the Hesse and Palatinate regions.

the carriers of the culture of their ancestors and tried to preserve their religion, mother tongue, and folklore during the first decades of the USSR, which also meant that gender equality and the level of female education were exceptionally high among this group. Many Volga Germans assimilated fully and moved out of the Volga region to other parts of the Russian Empire and of the USSR. Before WWII, ethnic Germans lived throughout the country and, particularly, in large cities. In 1941, they were deported irrespective of place of residence (Polian, 2004).

Before the revolution, polygamy and arranged marriages of female children were common practices among the Muslim population and in Central Asia (the destination of 58% of all ethnic deportees). In contrast, such practices were practically absent among non-Muslim population of the Russian Empire, particularly, among ethnic Germans and Russians. After the revolution, the official campaigns of female emancipation were opposed by the Muslim population of Central Asia as well of the North Caucasus, Crimea, and Georgia, the origin of most Muslim deportees. Adherence to the traditional norms proclaimed illegal by the Soviet state was considered an act of resistance against the Russian-Soviet colonizers (Northrop, 2004).[30]

Historians and anthropologists disagree about the relative position of the Central Asian native population and Muslim deportees to Central Asia in terms of their gender norms. Some (e.g., Ro'i, 2000; Pohl, 2008) argue that, during and after WWII, deported groups, and in particular Chechens, resisted Soviet policies of female emancipation and secularization more than the local Muslim population at the deportation destinations in Central Asia. More generally, *"the Chechens demonstrated a propensity for insubordination during deportations"* (e.g., Pohl, 2008). Being deported on the basis of ethnicity strengthened the ethnic identity of deportees and reinforced beliefs and practices that the Soviet state tried to eradicate. For instance, adherence to Sufism increased among Chechens during the time of deportation *"possibly to demonstrate protest against deportation and to ensure group solidarity"* (Ro'i, 2000, p. 407). Ethnic deportees from the North Caucasus observed Ramadan more strictly and celebrated Muslim festivals more actively compared to the native population (Ro'i, 2000, p. 408). Ro'i (2000) documents that *"Chechen adults were 'believers,' some of them to the point of fanaticism, and there was evidence that both Chechens... were far more religiously observant than most of the indigenous inhabitants in their areas of 're-settlement'."*[31]

[30] Nekrich (1978) reports sixty-nine acts of violent resistance against the imposition of new Soviet norms in 1931-1933. Traditional governance structures of the North Caucasus continued to play an important role for a long time after the revolution. Ro'i (2000) reports that some religious Muslim sects within the Chechen population were powerful enough to reject *kolkhoz* directors nominated by the local Communist party administration (*raikom*) and appoint their own nominees (p. 407). Everyday disputes were often resolved in accordance with Sharia law.

[31] Ro'i (2000) also argues that polygyny remained common among Chechens during the time of deportations (in 1950s and 60s) and even after they returned to the North Caucasus from the depor-

Other scholars, and most notably Deweese (2002), argue that, despite bringing to light important archival data about Muslims in the USSR, including those deported during WWII, Ro'i (2000) significantly overstated the extent of backwardness of gender norms among Chechens.[32] Irrespective of how the gender norms of Muslim deportees compare to those of the native population of Central Asia, historians agree that there is very sharp contrast between the gender norms of Muslim and Protestant deportees; and this is the variation we explore in this paper.

After the end of the Civil War, ethnic Russians adhered to Soviet policies, including those promoting the emancipation and education of women, without much resistance, in contrast to Muslim groups residing in the USSR. Before the revolution, gender discrimination and female illiteracy were widespread among Russians, particularly in rural areas; and Russia was predominantly rural before Stalin's industrialization. The first two decades of Soviet rule marked great progress, both in education overall and in closing the literacy gap between Russian men and women. For instance, by 1939, literacy rates among women in the Russian Soviet Federative Socialist Republic (RSFSR) reached 54% in rural areas and 73% in urban areas (the corresponding level of male literacy in 1939 was 70% and 81%, respectively).

C Details about the data

C.1 Ethnicity of company directors in Orbis

We use the lists of names of German and of Chechen ethnic deportees from the Political Repression Victims Database collected by the historical and human rights NGO Memorial (2015). The two lists contain the last and the first names of each deportee in Cyrillic. German deportees had very characteristic last lames, whereas their first names are rather common and not characteristic of the group. Thus, we simply identify all company directors with these last names in our Orbis sample. Chechens, in contrast, have less characteristic names than German deportees. Both their first and last names often are traditional Muslim. So, to increase the precision, we use information on both the first and last names of Chechen deportees. We identify all company directors with first and last names matching names from the separate lists of first and last names of Chechen deportees. Even when match both first and last names, we are likely misclassify some of the Central Asian company directors with Muslim names as Chechen (e.g.,

tation destinations (p. 539). Child marriages among Chechen deportees precluded girls from going to school: *"In one village, out of seventy-five girls who should have been in school in the fourth to the seventh grade, only four attended school"* (p. 541).

[32]See also Tishkov (2004); Khasbulatova (2007); Nanayeva (2012); Lazarev (2019) for a description of gender roles among Chechens.

a company director called Ahmed Ahmedov, could be Chechen or Central Asian). To make sure that we do eliminate the descendants of Chechen deportees from the list of company directors, we classify directors with purely Muslim last and first names as Chechen as long as these names are found in the lists of first and last names of Chechen deportees. Thus, the classification we use is rule-based rather than statistical, but it is the simplest and most robust. In order to match the names we used two different translations for the latinization or romanization of the Cyrillic alphabet.

C.2 LiTS question on gender attitudes that we do not use in the baseline analysis

In the baseline analysis, we use the following LiTS questions as measures of gender attitudes. *To what extent do you agree with the following statements?: "A woman should do most of the household chores even if the husband is unemployed"; "It is better for everyone if the man earns the money and the woman takes care of home;" "Men make better political leaders than women do."* This block of questions also contains another statement: *"Women are as competent as men to be business executives."* We do not use it in the main analysis. However, as we show below, when we include this variable in the principal component analysis, the results remain the same.

The reasons for leaving this variable out are three-fold. First, it is unclear what it means if people disagree with this statement. They may think that: women are *worse* than men as executives or they could think that women are *better* than men as executives. In the former USSR, where women live much longer than men and men are much more likely to suffer from alcoholism, the second interpretation is not impossible, despite the fact that the majority of business executives are men. Thus, we do not know how to interpret this variable. There is no ambiguity in interpretation of the answers to the other three questions. Second, unlike with all other statements, for which the disagreement is a sign of pro-gender-equality norms, for this statement, it is, rather, the agreement with the statement, which may have confused the respondents. Finally, this variable is negatively and significantly correlated with every other measure of pro-gender-equality, whereas all the other measures are positively and significantly correlated with each other. We report the correlation table in Online Appendix Table A18. As a result, if we include this variable in the principal component analysis, its factor loading in the 1st principal component is negative, whereas the factor loadings of all other questions are positive and very similar in magnitude to each other.

To establish robustness of the results, we do calculate the first principal component using all four measures and use it as the outcome variable (just as in the baseline, we normalize the outcome variable to be between 0 and 1). We denote this variable $PC1_4$.

The results are as follows:

$$PC1_4 = \underset{[0.004]}{0.022} \times \log(1 + Protestant\_Deportees_{l_i}) +$$
$$- \underset{[0.007]}{0.010} \times \log(1 + Muslim\_Deportees_{l_i}) + ...$$

and

$$PC1_4 = \underset{[0.035]}{0.145} \times Protestant\_Deportee\_Share + ...$$

They are very similar to the last column of Table 6. If we consider this variable rather than the principal component, as the outcome variable, the signs of the coefficients on the measures of the number and the share of Protestant deportees are negative. In the levels specification, the coefficient of interest is even statistically significant, but not in the shares specification. However, given that all the other results from three completely different datasets point in the opposite direction and that it is unclear how to interpret this variable, we leave it out of the main analysis. The robustness of the results to including this variable in principal component analysis does suggest that whether we do or do not consider this question would not affect the main conclusions.[33]

C.3 Details of data from 1897 and 1939 censuses

Data from the 1897 Russian empire census were published at the county (*uezd*) level. Castañeda Dower and Markevich (2020) digitized these data for Russia and we digitized them for Central Asia. In particular, we collected the following variables: population density, urbanization, religious composition, the shares of Russian and German minorities, the shares of those working in agriculture, in industry, and in services and trade, the share of the population employed in white collar jobs, the share of the literate population, and the share of literate women. We use a digital map from Castañeda Dower and Markevich (2018) to match the 1897 population statistics with the rest of the data.

[33] In other blocks of LiTS questions, there are two other questions that mentions gender equality. In particular, they are formulated in the following way: (1) *"To what extent do you agree that the following are important for [COUNTRY]?"* This block consists of 8 questions, about peace and democracy, one is: *"Equal rights for women as citizens"*. (2) With the same set of answers, there is also a question *"To what extent do you agree that the following exists in [COUNTRY]?"*. As these questions focus on "your country" and not on the respondent or the locality of the respondent, they are not well suited to address our research question because we want to measure the differences in respondents' attitudes across municipalities within subnational regions. There are also questions about the importance of education of sons and daughters. Unfortunately, there is almost no variation in the answers concerning daughters vs. sons. Thus, we do not use these questions in our analysis.

To match 1939 population data with deportation locations and the rest of the data, we have built a digital map of the 1939 USSR at the municipality level. This map was constructed using the scans of Soviet maps for different areas of the USSR.

D Variation in the group composition of ethnic deportees and in the outcomes variables

Online Appendix Tables A19, A20, and A21 describe the three main data sets used in the analysis: the 2010 census, Orbis data, and LiTS. We report how many regions, municipalities, and individual respondents or firms there are in each dataset and how many municipalities there are per region and how many individual respondents or firms there are per municipality. The tables also present the variance decomposition for the main treatment variables and the main outcome variables into between region and within region for the baseline samples in each of these datasets. In our analysis, we rely on the within-region variation and our main treatment variable is defined at the municipality level. Despite the fact that the LiTS dataset is several orders of magnitude smaller than both census data and Orbis data, all datasets, including LiTS have enough meaningful variation for us to conduct the analysis.

E Robustness of LiTS results

Table A16 presents the robustness of the LiTS results to the choice of covariates. In Column 1, we restate the main results using the baseline set of controls. In Column 2, there are no controls with the exception of region fixed effects, which are necessary to the main identification assumption. In Column 3, we additionally control for selection of localities into deportation destinations, which is also important for identification. In Column 4, we add controls for the size of non-Protestant and non-Muslim deportations in the vicinity of the locality, forcing the comparison to be between the exposure to Protestant and to Muslim deportees. In Column 5, we also add locality-level geographical controls and the size of the 1939 local population. Column 6 adds respondent's age, gender, and religion. The baseline specification (Column 1) adds to this list of covariates two potentially endogenous but important determinants of gender norms: respondent's income and education. In Column 7, we add all historical covariates that show any sign of misbalance in the balance Table A13 in the Online Appendix, as well as female labor force participation in 1897. Finally, in Column 8, we add another two potentially endogenous variables, educational attainment of respondent's parents, into the set of covariates. We find that the results do not depend on the set of controls:

both the point estimates and the significance levels are stable across specifications once we control for selection into deportation locations.

In the main estimation using the LiTS sample, we use the Conley correction of standard errors for spatial correlation at a radius of 150km. In Table A17 in the Online Appendix, we report robustness to alternative assumptions about the variance-covariance matrix. The results are robust to increasing the Conley radius to 200 kilometers, to clustering at the LiTS-PSU level, and at the subnational region level. They are also robust to using LiTS-PSU-level aggregated data.

Our measure of the exposure of the local population to deportees in the LiTS sample uses the numbers of Protestant and Muslim deportees in a 30-kilometer travel distance vicinity of LiTS PSUs. Figures A5 and A6 in the Online Appendix visualize the results of a robustness exercise in which we change the radius in the definition of the vicinity of a locality used for calculating the numbers of deportees around the LiTS PSUs. We plot the estimated coefficients along with their confidence intervals on the explanatory variables of interest for the main outcomes with radii equal to travel distances of 10, 20, 30, 40 and 50 kilometers. We find that the results are the strongest with the 30-kilometer radius, but they are largely robust to using radii between 20 and 40 kilometers.