The Unintended Long-Term Consequences of Dismissal and Exile of High-Skilled Professionals: Evidence from Nazi Germany[*]

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Abstract

This paper provides causal evidence on long-term consequences of the dismissal and exile of the Jewish professionals on the educational attainment, labor market, political and social capital outcomes of German children. We combine a unique city-level dataset on the fraction of Jewish population residing in Germany before the Nazi Regime with individual survey data from the German Socio-Economic Panel (GSOEP). Our identification strategy exploits the plausibly exogenous city-by-cohort variation in the intensity of Jewish population in Germany as a unique quasi-experiment. Our findings suggest significant, long-lasting detrimental effects on the human capital formation, labor market, political and social capital outcomes of Germans who were at school-going age during the expulsion and exile of Jewish professionals. First, these children had 0.5 fewer years of schooling on average in adulthood, with those in residing in cities with highest fraction of Jews completing 0.8 fewer years. Second, these children were less likely to go to college or have a post-graduate degree. Third, conditional on being employed, these children have lower labor market earnings in the future. Forth, they are less likely to have interest in politics and have a lower probability to trust and take risk as adults. These results survive using alternative samples and specifications, including controlling for migration of Germans and Second World War effects. An important channel for the effects on educational attainment appears to be the dismissal of school teachers and university professors. On the other hand, the decrease in the size of the middle class appears to be important for the estimated impact on political outcomes and trust and risk attitudes.

JEL Codes: I21, I12, J24, N34
Key words: human capital formation, dismissal, Jewish professionals, political development

1. Introduction

An extensive literature on endogenous economic growth has put emphasis on the role of human capital as a factor of production, and on increasing returns to knowledge as a source of long-run differences in income levels across countries. Thus, the loss of human capital due the emigration, exile or mass murder of high-skilled professionals induced by armed conflicts, ethnic cleansing, economic or political turmoil will negatively affect the home country's macro economic performance as well as its growth prospects though several channels. First of all, skilled workers are net fiscal contributors and their departure therefore represents a fiscal loss for those left behind. Second, skilled and unskilled labor complement one another in the production process; in a context of scarcity of skilled labor and abundant unskilled labor, as is the case in developing countries, loss of skilled labor may have a substantial negative impact on unskilled workers' productivity and wages and lead to higher inequality in the home country. And third, as demonstrated in various new economic geography (e.g., Hoffmann, 2003) and new growth (e.g., Klenow and Rodriguez-Clare, 2005) frameworks, skilled labor is key to attracting FDI and fostering R&D activities (technological externality).

However, as of yet, less is known about the long-term micro-level impacts of large-scale human capital loss. Especially, children and young adults may be especially adversely affected by the emigration or mass murder of the high-skilled professionals given the age-specific aspect of many human capital investments. For example, the loss of teachers may undermine the ability of schools and education systems to function. Similarly, the loss of doctors and nurses may impair efforts to deliver even basic healthcare and public health programs. Moreover, the loss of other skilled professionals may act as a barrier to institutional capacity building, industrialization, the efficient utilisation of external assistance and private sector growth.

Additionally, the change in the social structure, especially the change in the size of the middle and high class due to human capital loss may result in either temporal ("non-chronic") or permanent changes ("chronic" or "personality" changes or disorders) in behaviour, perceptions and attitudes which foster or hinder economic growth (McCrae, 2006).

This paper provides causal evidence on long-term consequences of the expulsion and emigration of high-skilled professionals on children's outcomes in home countries. Specifically, we use city-by-cohort variation in Jewish population in Germany before World War II as a unique quasi-experiment to estimate the effects of the dismissal and emigration of Jewish professionals on the human capital formation, earnings, political and social capital outcomes of individuals who were school-aged during the Nazi Regime. The *"Law for the Restoration of the Professional Civil Service"* which passed shortly after the Hitler's Nazi Party came into power in 1933, caused more than 15 percent of university professors, school teachers, doctors and other white-collar professionals who were Jewish to be dismissed from their professions and emigrate from Germany (Strauss, 2005). Majority of these dismissed scholars were outstanding members of their profession. Starting from 1933, many Jewish professionals including Albert Einstein, Gustav Hertz, Erwin Schroedinger, Max Born and twenty past or future Nobel Prize winners, left the country (Evans, 2005).

On the one hand, cities with higher fraction of Jewish population were exposed to a dramatic change in the number and quality of teachers, university professors and physicians compared to cities with lower fraction of Jews. The intensity of high-skilled loss depended on the ex ante fraction of Jewish population residing in German cities; hence almost all Jews in Germany emigrated or died in the concentration camps during the Nazi Regime. On the other hand, only German individuals who were at school-age during Nazi Regime would have had

their human capital investment affected by the exile of Jewish professionals; the human capital of cohorts born after WWII reconstruction period would not be affected by the dismissal of Jewish professionals.[2] This leads us to use a difference-in-differences-type strategy where the "treatment" variable is an interaction between city-level intensity of Jewish population before the exclusion of Jewish professionals in 1933 and dummy for being school-aged during the Nazi regime, and where we always control for city fixed effects and cohort fixed effects. *The identifying assumption is that had the expulsion of Jewish population not occurred, the difference in schooling, labor market, political and social capital outcomes between the affected cohorts and the cohorts born after the post-war reconstruction would have been the same across cities of varying intensity of ex ante Jewish population.*

Our analysis combines a unique dataset on the fraction of Jewish population in 1933 for each German Regional Policy Region (Raumordnungsregionen, hereafter, "ROR", "region" or "city")[3] with individual-level data from the 1985 wave of a nationally-representative survey, German Socio-Economic Panel (GSOEP). Since the persecution of Jews from public life began systematically, shortly after the Nazi Party came into power in 1933, our historical data gives the most accurate information on the fraction of Jews in Germany before the Nazi Regime.

This paper makes several contributions. First, to best of our knowledge, this is the first paper that rigorously quantifies the unintended long-term consequences of expulsion of Jewish professionals during the Nazi Regime on German children's human capital, labor market,

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[2] As explained in Section 4, we will use individuals born between 1951 and 1960 as the control group. Individuals born between 1924 and 1950 are dropped from the analysis since their exposure to WWII destruction and post-war reconstruction is not clear. Akbulut-Yuksel (2009) shows that WWII destruction had detrimental long-term effects on cohorts born between 1924 and 1939. On the other hand, cohorts born between 1940 and 1950 might have been partially affected by WWII destruction. Though they would have started school after WWII ended, of course reconstruction did not occur overnight.

[3] The analysis is restricted to former West Germany. West Germany comprises of 75 RORs. RORs are analogous to metropolitan statistical areas (MSAs) in the U.S., though, in contrast to MSAs, RORs also encompass rural areas; that is, all of Germany, regardless of urbanicity, belongs to an ROR.

political and social capital outcomes. Second, there are very few studies looking at the long-term economic and political legacies of Holocaust and we add to this growing literature. We believe that the present study is the first to combine the city-level data on ex ante Jewish population in Germany with individual-level survey data and look at the micro-level outcomes; thus we are able to control for individual and family background characteristics in the analysis of long-term consequences of expulsion of Jews. Third, this paper informs on the general question of how "human capital flight" impact human capital formation, earnings and political development in the source countries. Loss of productive skills due to emigration, civil conflicts, ethnic cleansing, economic and political instability seems to have gotten more common in developing countries in recent years (Carrington and Detragiache, 1998; Collier, Hoeffler and Rocher, 2008; de Walque and Verwimp, 2009). Understanding the long-run effects of loss of high-skilled professionals and the mechanisms through which it impacts children and young adults in source countries is policy-relevant. To the extent that loss of high-skilled professionals have long-run detrimental effects on children's human capital, labor market and political outcomes, policymakers can devise policies and programs to stem these effects.

To preview our results, we find that the exile of Jewish professionals during the Nazi Regime had detrimental effects on education, political and labor market outcomes even after 50 years. First, children who were school-aged during the Nazi Regime had 0.5 fewer years of schooling on average in adulthood, with those in residing in cities with highest fraction of Jews completing 0.8 fewer years. Second, these children were less likely to go to college or have a post-graduate degree. Third, conditional on being employed, these children have lower labor market earnings in adulthood. Forth, they are less likely to have interest in politics and have a lower probability to trust and take risk as adults. These results survive using alternative samples

and specifications, including controlling for migration of Germans, WWII effects and the fraction of Jewish population after WWII. An important channel for the effects educational attainment appears to be the dismissal of school teachers and university professors. On the other hand, the decrease in the size of the middle class appears to be important for the estimated impact on political outcomes and trust and risk attitudes.

The remainder of the paper is organized as follows. Section 2 reviews the related literature. Section 3 provides a brief background of the expulsion and emigration of Jewish professionals during the Nazi Regime. Section 4 discusses the identification strategy. Section 5 describes the city-level historical data and individual-level survey data used in the analysis. Section 6 presents the main results, extensions and robustness checks. Section 7 concludes.

2. Literature Review

As a shock to accumulated human capital, the dismissal and emigration of Jewish professionals in 1933 provides a laboratory setting to study the impact of human capital loss on long-term outcomes. A recent paper by Acemoglu, Hassan and Robinson (2009) documents a statistical association between the severity of the mass murder of Jews by the Nazis during World War II and long-run economic and political outcomes in Russia. They find that cities that experienced the Holocaust most intensely have grown less and administrative districts where the Holocaust had the largest impact have lower urban populations, GDP per capita and lower average wages in 2002. In addition, they show that these same cities and oblasts exhibit a higher vote share for Communist candidates since the collapse of the Soviet Union in 1999. They also provide evidence suggesting that the change in the social structure, in particular the size of the middle class might be responsible for estimated effects of Holocaust. On the other hand, using the dismissal of science professors by the Nazi government as a source of exogenous variation in

peer quality, Waldinger (2009) finds that the dismissal of the Jewish professors had negative consequences on productivity of PhD students and fellow German scientists that co-authored with Jewish scientists. He shows that among PhD students of these professors, the probability of publishing their dissertation decreased by about 12 percentage points and they were about 8.4 percentage points less likely to hold full professor position in the future in Germany.

This study also closely relates to the extensive literature looking at the association between war devastation and countries' socioeconomic performance from a macro perspective. One set of studies has focused on the long-run effects of U.S. bombing during WWII-including in Japan (Davis and Weinstein, 2002) and in Germany (Brakman, Garretsen and Schramm, 2004)-find no evidence for the persistent impacts of the bombing on city size. Using the extensive U.S. bombing campaigns in Vietnam during the Vietnam War as a quasi experiment, Miguel and Roland (2005) revisit the same question. They provide similar evidence suggesting that U.S. bombing did not have any long-lasting effects neither on physical infrastructure and local population, nor on literacy and poverty levels, 25 years after the Vietnam War. Thus, this strand of the literature finds that war impacts are limited mainly to the temporary destruction of physical capital.

Due to data constraints however, only handful of studies have attempted to provide micro-level evidence on the cost of WWII on civilians' outcomes, in particular those of children.[4] Using plausibly exogenous city-by-cohort variation in the intensity of WWII destruction in Germany as a quasi experiment, Akbulut-Yuksel (2009) shows that wartime

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[4] However, an extensive prior literature has focused on the impact of military service on the human capital accumulation and later labor market outcomes of combatants in US, Europe and Africa (Angrist, 1990, 1998; Angrist and Krueger, 1994; Imbens and van der Klaauw, 1995; Blattman and Annan, 2009). However, veterans are likely to be impacted by the war in different dimensions than the rest of the population who are not involved in the war; therefore studies on veterans provide limited information on the impact of wars on the civilian population and children.

destruction had a substantial negative effect on long-term human capital formation, health and labor market outcomes of Germans who were at school-age during WWII. Angrist and Kugler (2008) show that an exogenous upsurge in conflict activities arising from increase in coca prices and cultivation in Colombia has a negative effect on teenager boys' school enrollment. Similarly, using WWII as an instrumental variable to estimate the causal effect of education on earnings, Ichino and Winter-Ebmer (2004) find that individuals who were 10 years old during or immediately after WWII acquire less education and earned significantly less in adulthood compared to other cohorts within Germany and Austria as well as to individuals of the same cohort born in non-war countries (namely, Switzerland and Sweden). They argue that WWII exposure affects earnings of these individuals only through deteriorating their human capital formation.

This study also contributes to literature looking at the association between the brain drain and growth of source countries. Similar to brain drain, due to the dismissal and emigration of Jewish professionals during the Nazi Regime, Germany lost the highly educated fraction of its population. This strand of literature suggests that brain drain may have negative consequences for the source country through several channels. First, skilled migrants are net fiscal contributors and their departure therefore represents a fiscal loss for those left behind. Second, skilled and unskilled labor complement one another in the production process; in a context of scarcity of skilled labor and abundant unskilled labor, as is the case in developing countries, skilled labor migration may have a substantial negative impact on unskilled workers' productivity and wages and lead to higher inequality in the home country. Third, since the human capital is the engine of growth and education decisions engender both intragenerational and intergenerational externalities (Lucas, 1988); in such a setting, brain drain migration will negatively affect the

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home country's current economic performance as well as its growth prospects. And fourth, as demonstrated in various new economic geography (e.g., Hoffmann, 2003) and new growth (e.g., Klenow and Rodriguez-Clare, 2005) frameworks, skilled labor is key to attracting FDI and fostering R&D activities (technological externality).

To summarize, this paper contributes to the literature on long-term legacies of Holocaust by using econometric techniques to estimate the causal impact of dismissal of Jewish professionals by Nazi government on long-run human capital, labor market, political outcomes and attitudes. We are unaware of studies that rigorously identify the causal association between severity of Holocaust and long-term outcomes in Germany. Furthermore, we believe that the present study is the first to combine the city-level data on ex ante Jewish population in Germany with individual-level survey data; thus we are able to control for individual and family background characteristics in the analysis of long-term consequences of Holocaust.

3. Background on Dismissal of Jewish Professionals during the Nazi Regime

The 1933 census established that there were 525,000 Jews in Germany at that time, composing 1.13 percent of the country's population.[5] Figure 1 presents the distribution of Jewish population in Germany in 1933. Even though, Jews were a mere 1 percent of the German population, they had mostly been remarkably successful in German society and culture since their emancipation from legal restrictions in the course of the nineteen century (Evans, 2005). The Jewish community gained in visibility by gradually concentrating in the large cities. Two-thirds of Jews were concentrated in cities over 100,000 inhabitants. The remaining third lived in settlements ranging from middle-sized cities down to villages (Kaplan, 2005). Moreover, Jews

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[5] The corresponding percentage of Jewish population in Russia in the recent paper by Acemoglu, Hassan and Robinson (2009) is 0.87 for cities and 0.55 for oblasts (administrative units) in Russia.

tended to be concentrated in certain professions and occupations. In some of these professions the ratio of Jews was several times that of the population at large. It is well known that there was a substantial rise in the number of Jews who practiced the free professions or were employed in academe. Also, it was quite common to find Jews in the professions - for example, in medicine and teaching, also law and journalism. Some were in financial services and trade. Many owned small businesses.

The persecution of the Jews began systematically, shortly after the Hitler's Nazi Party secured power in 1933. Two turning points took place in the first few months of the Nazi regime: the boycott of Jewish stores on April 1, 1933, and the exclusion of Jews from the civil service through the "Law for the Restoration of the Professional Civil Service" of April 7 (Evans, 2005). This law allowed Nazi government to purge Jews from civil service, a vast organization in Germany that included school teachers, university staff, judges and many other professionals that were not government-controlled in other countries. In May 1933, it was amended to include supplemental regulations for other status groups, and the extensions of the term "civil service" to include the postal service, railroads, communal health insurance systems, professional associations, unemployment and salaried employees' insurance, miners' guilds, trade guilds and chambers of commerce followed.

As a result of "Law for the Restoration of the Professional Civil Service", a growing number of Jewish teacher were forced to leave their jobs in the general school system. For instance, in Baden, the minister of education had ordered leaves of absence on April 5, 1933, for all "members of the Jewish race" for the purpose of "maintaining security and order". With the passage of civil service law, some of those given leave of absence were permanently dismissed. Those Jewish teachers, who were not fired in April 1933, were compulsorily pensioned off in

1935; two years after Jews and "half-Jews" were formally banned from teaching in non-Jewish schools.

With the "Law for the Restoration of the Professional Civil Service", Jewish professors in all fields were also dismissed. According to an estimate of social historian Herbert Strauss (1983), approximately 15 percent (1,100 to 1,500) of university professors of all categories were dismissed and forced to emigration starting 1933. When non-university research scientists and scholars who had begun but not completed their training at the time of emigration are included, this figure becomes approximately 2,000. Due to these dismissals, many scientists, including Albert Einstein, Gustav Hertz, Erwin Schrodinger, Max Born and twenty past or future Nobel Prize winners, left the country (Evans, 2005). This number was even higher in medicine. Teachers of medicine made up roughly a third of all university faculty members by 1935, and during the Nazi Regime, 59 percent of university rectors were drawn from the medical profession (Evans, 2005).

Further legislation in 1933 sharply curtailed "Jewish activity" in the medical and legal professions. As early as July 1933, Jewish doctors lost their patients with substitute health insurance schemes, and private insurance companies reimbursed the fees of Jewish doctors only for their Jewish patients. In 1938, all Jewish doctors lost their medical licenses, and Jewish lawyers lost their admission to the bar. Removal of Jewish doctors from the profession created a large number of vacancies for Aryan graduates to fill.

On the other hand, starting from April 1933, German law also restricted the number of Jewish students at German schools and universities. Additionally, the rabid hostility of the Nazi Students' League drove most Jewish students out of universities within a short space of time, so that only 590 were left in the autumn semester of 1933 compared to 3,950 in the summer

semester of the previous year. In a similar vein, the hostility of fanatical Nazi teachers and increasingly, Hitler Youth activists in the schools had a powerful effect in driving Jewish children out.

The foregoing discussion of the historical accounts of the dismissal of Jewish population suggests that the severity of the Holocaust in Germany depended on fixed city characteristics (e.g., the ex ante fraction of the Jewish population before the Nazi Regime). In our main analysis, we will take the cross-regional variation in intensity of Jewish population before the Nazi Regime as exogenous once we control for city fixed effects.

4. Identification Strategy

In this section, we describe our strategy for identifying the causal effect of the dismissal and exile of the Jewish professionals on the long-term outcomes of German children. This strategy exploits the plausibly exogenous city-cohort variation in the fraction of Jewish population in German cities before the turmoil of Nazi Regime. This is a difference-in-differences-type strategy where the "treatment" variable is an interaction between percentage of Jewish in the city in 1933 and dummy for being school-aged during the exclusion of Jews from the civil service in 1933. In particular, the proposed estimate of the average treatment effect is given by β in the following baseline city and birth cohort fixed effects equation:

$$Y_{irt} = \alpha + \beta \, (\textit{Jewish\_Fraction}_r \times \textit{Affected\_Cohort}_{it}) + \delta_r + \gamma_t + \pi' \mathbf{X}_{irt} + \varepsilon_{irt} \qquad (1)$$

where Y_{irt} is the outcome of interest for individual i in city r born in year t. *Jewish_Fraction*$_r$ is the percentage of Jewish population before the Nazi Regime in 1933 in city r. *Affected_Cohort*$_{it}$

is a dummy variable that takes a value of 1 if individual *i* was born between 1914 and 1923 and zero otherwise. Individuals born between 1914 and 1923 were still at school-age continuing their education when the Nazi government forced Jews out of the civil service, independent professions and higher education in 1933 and their schooling has the potential to be affected by the dismissal of Jewish teachers and professors from public schools and universities. The schooling of individuals born after WWII would not have been impacted by the dismissal and exile of Jewish professionals; hence these later birth cohorts are in the control group.[6] δ_r is city-specific fixed effects, controlling for the fact that cities may be systematically different from each other. γ_t is the birth year-specific fixed effect, controlling for the likely secular changes across cohorts.[7] $\mathbf{X}_{irt}$ is a vector of individual characteristics including gender and rural dummies as well as family background characteristics (e.g., parental education). ε_{irt} is a random, idiosyncratic error term.

In order to interpret β as the effect of dismissal of Jewish professionals, we must assume that had the dismissal and emigration of Jewish professionals not occurred, the difference in schooling, labor market and political outcomes between the affected cohorts and the cohorts born after WWII would have been the same across cities of varying intensity of ex ante Jewish population before the Nazi Regime. We assess the plausibility of this assumption below by performing a falsification test/control experiment where we repeat the analysis using only cohorts who were already beyond school age.

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[6] As we explain below, we will use individuals born 1951-1960 as the control cohorts. Individuals born 1924-1950 are dropped since they were also exposed to WWII destruction.
[7] Since we will be using a single cross section, this γ_r accounts for not only cohort but also age effects.

5. Data and Descriptive Statistics

The measure of ex ante Jewish population we use for our main analysis is from Kessner (1935), who reports the German population statistics from German Population and Occupation Census conducted in 1933. Kessner (1935) provides city-level information on the fraction of Jewish population residing in German cities in 1933, which is what we use as a measure of Holocaust severity. Since the dismissal and emigration of German Jews started after the passage of After Law for the Restoration of the Professional Civil Service in 1933, we believe that this data gives the most accurate information on the fraction of Jews in Germany during the Nazi Regime.

To disentangle the impact of dismissal of Jewish professionals from the WWII exposure effects, we compiled city-level data on physical destruction experienced by German cities during WWII. The measure of WWII destruction intensity we use in our analysis is from Kaestner (1949), who reports the results of a survey undertaken by the German Association of Cities ("Deutscher Staedtetag"). Kaestner (1949) provides city-level information on the aggregate residential rubble in m^3 per capita in German cities by the end of WWII, which is what we use as a measure of city's overall wartime destruction.[8]

To gain better understanding on the distribution of Jews in Germany before the Nazi Regime and assess the mechanisms through which the expulsion of Jewish population might have affected German children's long-run outcomes, we gathered data from various years of the German Statistical Yearbooks. First, we assembled city-year data on the number of teachers, and professors; of particular interest is the change in the number of teachers and professors

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[8] This same source also provides information on the percentage of the residential dwellings destroyed in 1946 in the territory of former West Germany. The correlation between these two measures of WWII destruction is 0.9; thus we present the results with rubble per capita measure which is available for more municipalities. For detail information on WWII destruction data, see Akbulut-Yuksel (2009).

immediately after 1933 because this would have been the change in school inputs available to the affected cohorts. Additionally, we compiled data from German Statistical Yearbook on city characteristics including average income per capita, total area and population size in 1933 to understand the nature of Jews' distribution within Germany before the Nazi Regime.

The data on individual and household characteristics come from the confidential version of German Socio-Economic Panel (GSOEP). GSOEP is a household panel survey that is representative for the entire German population residing in private households. It provides a wide range of information on individual and household characteristics as well as parental background and the childhood environment in which one grows up. We restrict the empirical analysis to individuals born between 1914 and 1960. We dropped individuals born between 1924 and 1950 from the analysis since Akbulut-Yuksel (2009) shows that WWII had detrimental long-term effects on cohorts born between 1924 and 1939. Similarly, we also dropped cohorts born between 1940 and 1950 since their exposure to WWII is not as clear.[9]

We consider the dismissal of Jewish population impacts at the Regional Policy Regions (RORs) level which are spatial units defined by the Federal Office for Building and Regional Planning (Bundesamt fuer Bauwesen und Raumordnung, BBR), to differentiate between areas in Germany based on their economic interlinkages. Germany has 75 different regional policy regions in Germany (see Figure 2 for detailed information on RORs). GSOEP is the only German dataset that provides information on the location of German households at ROR level along with other individual and household level information. The GSOEP reports households' ROR information starting from 1985; thus we conduct the empirical analysis with the 1985 wave

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[9] The empirical findings are qualitatively similar if we use the entire sample and different cutoffs. The results for entire sample, where these 1940-1950 cohorts are added to the control group, are presented in Appendix Table 1. Point estimates tend to be smaller; this is not surprising since the control group now includes some cohorts that may have partially impacted from WWII destruction; i.e., they were affected to some extent by the destruction since reconstruction did not occur overnight.

of GSOEP. We also restrict our analysis to West Germany, for which we have earlier waves of GSOEP.

The GSOEP provides information on cities where individuals are residing in 1985 onwards. Nevertheless, the GSOEP also asks respondents whether they still live in the city or area where they grew up.[10] This question helps us identify whether individuals still reside in their childhood city or area. On the other hand, it is well documented that Germany has historically low levels of geographic mobility in comparison to the U.S. and U.K. and that mobility is particularly low during childhood and early adulthood (Rainer and Siedler, 2005; Hochstadt, 1999). For example, mobility rates were very low during the period 1950-1970 among native Germans in former West Germany, with an annual migration rate between states of around 2%, defined as the ratio of number of migrants to or from a state within one year by the population of that state (Hochstadt, 1999).[11] Additionally, historical accounts document that wartime displacement was temporary. By June 1947, the urban population had reached 80 percent of prewar levels, then nearly 90 percent in 1948 (Hochstadt, 1999).

To form the final dataset used in the analysis, we recoded the raw data on fraction of Jewish population using German regional boundaries (ROR) employed by GSOEP in 1985 and then merged it by ROR with the individual-level data from the GSOEP.[12] Table 1 presents the descriptive statistics for population-weighted city-level intensity of Jewish population and

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[10] The GSOEP question based on which the movers are identified in this paper is "Do you still live in the city or area where you grew up until age 15?" with three possible responses "yes, still", "yes, again", and "no". I have coded individuals who answered this question as "yes, still" and "yes, again" as non-movers. The interpretation of city or area was left to the perception of the respondents; therefore it is likely that individuals are coded as movers even though they relocated within the same region rendering their exposure to WWII unchanged.

[11] In addition, individuals living in West Berlin in 1985 are excluded from the analysis as a robustness to avoid potential problems from East-West migration and the results are consistent with baseline specification.

[12] The data on Jewish population, rubble per capita, number of schools and teachers are available for almost all municipalities with more than 20,000 inhabitants in 1933. To obtain the regional averages of all destruction measures, we merge municipalities in 1933 using 1985 GSOEP regional borders. Each of these municipalities was part of current-day regions (RORs) in 1985.

variables measuring conditions before the Nazi Regime. Table 1 shows that on average German city, 1.13 percent of the population was Jewish in 1933. However, there was variation across cities in the density of Jews; the fraction of Jewish population in cities with above-average Jewish population was three times the Jewish population in cities with below-average Jewish population. Table 1 makes clear that cities with higher Jewish population are different than cities with lower Jewish population. For example, cities with higher Jewish population are larger in area and have higher population density and average income per capita in 1933. This highlights the fallacy of relying only on cross-city variation in the Jewish population to identify the effects of dismissal; it is likely incorrect to attribute all differences in children's outcomes between cities of varying Jewish population to dismissal and emigration of Jewish population because there are other differences between these cities that are correlated with these outcomes too. The difference-in-differences strategy we propose uses within-city cross-cohort variation to identify the effects of Holocaust, and controls for fixed differences between cities and cohorts.[13]

Table 2 shows the descriptive statistics of the outcomes and the main individual-level control variables we will use in our estimation. One of the main outcomes of interest is years of schooling completed. The GSOEP asks respondents about educational attainment; then in the data files maps these attainment categories into years of schooling. While most of my regression analysis is with the years-of-schooling measure, we will also present results using the attainment categories. We will also analyze labor market, political and social capital outcomes. As labor market outcomes, we use logarithm of hourly wage and employment. We use general interest in politics as a measure of political outcome, and five measures of social capital including trust and

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[13] There is a concern that the observed differences in levels of city size and per capita income suggest possible differences in trends in children's outcomes. Below, we assess whether there are differential trends by doing a falsification test/control experiment using data on cohorts who would have completed their schooling before dismissal of Jewish professionals and Holocaust.

risk attitudes, self-reported health satisfaction and, worries about finance and worries about peace. These outcomes are measured five decades after the dismissal of Jewish professionals, and reflect the outcomes of survivors who lived to 1985 or later.

6. Estimation Results

6.1. Estimates of Educational Attainment

Table 3 reports the results of estimating Equation (1) where the dependent variable is completed years of schooling. Each column is from a separate regression that controls for city and birth year fixed effects along with female and rural dummies. The difference-in-differences estimate, β, is reported in the first row. It is negative and significant at 95% level of confidence in every specification. Column (1) displays the difference-in-difference estimates for the entire population. Column (1) has an estimated β of -0.43 which suggests that the dismissal of Jewish population caused school-age children to attain on average 0.5 fewer years of schooling (this is the coefficient multiplied by the mean of the Jewish population in German cities in 1933, which is 1.13). To gain a better understanding on the magnitude of β, we can also compare the educational attainment of school-going age children who were in Frankfurt (one of the cities with highest percentage of Jewish population in 1933 where 3.25 percent of the city's population is Jewish) to that in Bremen (one of the cities with smaller number of Jewish inhabitants where 0.4 percent of the city's population is Jewish) during Nazi Regime.[14] Using this comparison, Column (1) suggests that children in Frankfurt had 1.2 fewer years of schooling compared to children in Bremen as a result of dismissal and emigration of Jewish professionals.

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[14] These two cities were very similar, but there were a higher number of Jewish inhabitants residing in Frankfurt and therefore children in Frankfurt experienced the greater reduction in high-skilled professionals.

Columns (2)-(4) of Table 3 present the results incorporating family background characteristics, such as father's and mother's educational attainment which are likely to serve as a proxy for parents' economic status. Columns (2)-(4) are from separate regressions where the difference-in-difference coefficient varies by parental human capital. The first row in columns (2)-(4) reports the estimation results for children whose parents had basic school degree (Hauptschule) or less.[15] Results summarized in columns (2)-(4) reveal that children with less educated parents had a greater reduction in their educational attainment (first row). On the other hand, interaction terms suggest that the negative effect of Holocaust is mitigated for children whose parents have more than basic education (second and third rows). This differential effect may work literally through parental education (e.g., more educated parents value education more, and so ensure their children are educated too even if negative shocks occur) or through other channels correlated with parental education such as family income or wealth (e.g., rich families can afford to educate their children, and can hire private tutors or send children to boarding schools when necessary).

To assure that, results summarized in Panel A are not driven by the choice of Holocaust measure, in Panel B, we estimate the same specifications in Panel A using change in the Jewish population in Germany during WWII as an alternative measure. Our results are quantitatively similar if we use this alternative measure of dismissal since the fraction of Jewish population was zero in almost all German cities by the end of WWII, with exception of Berlin.

Table 3 shows that the dismissal and exile of Jewish professionals (i.e., teachers, physicians and professors) decreases children's years of schooling by 0.5 years. It is also useful to estimate the effect of Holocaust on educational attainment, i.e., probability of completing

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[15] The basic school diploma (Hauptschule) is granted after 9 years of schooling in Germany. As shown in Table 2, the majority of children have parents with basic education or less (82% of fathers and 88% of mothers in my sample completed basic education or less).

certain degrees. For example, does the effect in Table 3 come from a reduction in middle school, secondary school, college or PhD completion? To assess at what level of education the adverse effect of Holocaust is present, we estimate the following baseline specification:

$$Y_{irtm} = \alpha + \beta_m \left(Jewish\_Fraction_r \times Affected\_Cohort_{it}\right) + \delta_r + \gamma_t + \pi'\mathbf{X}_{irmt} + \varepsilon_{irtm} \qquad (2)$$

where the outcome of interest, Y_{irtm} is a dummy variable that indicates whether the individual i born in year t, in city r, completed m years of schooling or more. β_m, for m=7 to 18, is the estimated effect of the dismissal of Jewish professionals on probability of completing each levels of education. The estimation results for difference-in-difference estimates are plotted in Figure 3 (the 95% confidence interval is also shown). Each point in Figure 3 is from a separate regression where the outcome is a dummy variable that takes a value of 1 if individual completed m years of schooling or more and zero otherwise. Figure 3 reveals at what level of education the adverse effect of expulsion of Jews is present. This figure shows that the dismissal of Jewish professionals disrupts individual's educational formation in all levels of education-the point estimates are always negative. However, the adverse effects of dismissal are more severe for young adults who were about to complete 12-18 years of schooling, where the effect is even stronger for probability of finishing 15-18 years of schooling. The 12 years of schooling is associated with Gymnasium completion; gymnasium is the highest high school track in the German education system. On the other hand, 15-18 years of schooling is associated with post college education, i.e. graduate studies. Therefore, Figure 3 suggests that young adults at universities accounted for most of the detrimental impacts of dismissal of Jewish professionals. As stated in Section 3, after "Law for the Restoration of the Professional Civil Service" in 1933,

Jewish professors in all fields were dismissed. Waldinger (2009) finds that the dismissal of Jewish professors had negative consequences for their PhD students. Along these lines, our results show that dismissal of Jewish professionals not only decrease the quality and success of PhD students as discussed in Waldinger (2009) but also decrease the likelihood of attending to college and PhD.

Threats to Validity

A potential confounding factor for results summarized in Table 3 is probability of the nonrandom migration across regions. For example, due to the dismissal and change in the structure of the cities, some of the German citizens might have moved to other parts of the country. Alternatively, the dismissal of Jewish professionals might have increased the available jobs in these cities and attract economic migrants and Nazi supporters seeking to fill the positions, the dismissed Jewish professionals vacated. Both types of migration might induce selection bias in the analysis of Holocaust effects on children's long-term outcomes. To address whether individuals' migration decision is based on the Jewish population in the region, we estimate Equation (1) using the probability of moving as the dependent variable; results are reported in Table 4. Individuals are coded as movers if they report that they no longer reside in their childhood city or area in 1985. Treatment and control groups for this specification are the same as in the education analysis. The difference-in-difference estimates for probability of moving are close to zero and statistically insignificant in every specification. This finding bolsters our confidence that individuals did not choose their final destination according to the fraction of Jewish population in the city in 1933.

Table 5 provides further evidence on lack of systematic migration. The analysis in Table 5 is restricted to individuals who still live in the city or area where they grew up (hereafter, "non-

movers"). The difference-in-difference estimates for non-movers are very similar to the estimates for the entire population (D-D estimates for the entire population and non-movers lie within each other's 95% confidence intervals). The empirical evidence presented in Table 5 supports our aforesaid findings that non-movers are not differentially impacted by the expulsion of Jewish professionals and suggests that the non-random migration is less likely to be a concern.

Results summarized in Table 3 rests on the assumption that in the absence of dismissal of Jews, the difference in educational attainment between the affected group and the control group would have been similar across cities (this is known as the parallel trend assumption). That is, the coefficient for interaction between dummy for being born 1914-1923 and city-level ex ante Jewish population in 1933 would be zero in the absence of dismissals. However, if there were differential cohort trends in educational attainment between cities with higher Jewish population and lower Jewish population, then it would not be possible to interpret the difference-in-differences estimate as due to dismissal and exile of Jews in Germany. To assess the validity of the identifying assumption, we perform the following falsification test/control experiment. We restrict the empirical analysis to older cohorts who would have completed their schooling at the outset of Nazi Regime. We code the oldest cohorts (i.e. those born between 1900 and 1906) as the "Placebo" affected cohort and cohorts born between 1907 and 1913 as the "Placebo" control cohort though of course there is no true treatment here. If there are no differential trends, then the difference-in-differences estimates should be zero, which is indeed what we find (see Table 6). The results in Table 6 lend credence to the identification assumption in Equation (1) and support the interpretation of the difference-in-difference estimates as due to exclusion of Jewish professionals as opposed to some city-specific cohort trend.

Another confounding factor may be the exposure to WWII. That is, it is possible that the WWII destruction experienced by the city might be correlated to the Jewish population residing in the city during the Nazi Regime. In this case, the coefficient for the interaction between dummy for being in "affected" cohorts and percentage of Jews in 1933 could yield a negative coefficient resulting from differences in exposure to WWII destruction across cities rather than from intensity of Holocaust. To address whether the "affected cohorts" have been impacted from WWII destruction differentially, we estimate Equation (1) using a measure of intensity of WWII destruction, i.e. rubble in m^3 per capita, instead of percentage of Jewish population in 1933. Table 7 presents the estimation results for this falsification exercise. The difference-in-difference estimates in Table 7 are very small and virtually zero suggesting that there was no meaningful variation in WWII exposure across cities of varying Jewish population before the Nazi Regime.

There are additional checks that might help us to understand the nature of the Holocaust and its impact on children's human capital formation. For example, dismissal of Jewish professionals, in particular dismissal of Jewish professors may have larger effect on educational attainment of males. Historical accounts suggest that college and PhD students were predominantly male during this time period (German Statistical Yearbook, 1935). Indeed, we find that the negative consequences of expulsion of Jewish population is more pronounced for males, where the difference-in-difference estimates for males is twice in magnitude compared to estimates for females. On the other hand, individuals residing in urban area may have disproportionately borne the negative effects of dismissal of Jewish professionals. Historical records documents that two-thirds of Jews in Germany were concentrated in cities over 100,000 inhabitants (Kaplan, 2005). The remaining third lived in settlements ranging from middle-sized cities down to villages; therefore the effect of Holocaust may be larger for individuals residing in

urban areas. We allow the impact of the dismissals to vary by urban status; however we find no differential effect for individuals residing in urban areas.

Additionally, one may expect the effect Holocaust to be non-linear, e.g., ex ante fraction of Jews surpasses a certain level then the detrimental effects become especially large, otherwise the effects are modest or negligible. To explore whether the negative effect of exclusion of Jews is more pronounced in cities with highest ex ante Jewish population, we divide the Jewish population intensity measure into quartiles. The estimation results from this specification show that the adverse effects of Holocaust are larger in cities that lost the higher fraction of inhabitants due to the Holocaust. Children in top quartile attain 0.8 fewer years schooling relative to the control group; this effect is twice as large as for the third and forth quartiles.

To summarize the estimation results so far, we find that dismissal and exile of Jewish professionals reduced the educational attainment of Germans who were at school-age during Nazi Regime. The reduction in education is borne disproportionately by people living in cities with higher fraction of Jewish population during the Nazi Regime, and whose parents were less educated. Analysis of the impact at each point in the education distribution suggests that the destruction caused individuals who might otherwise have completed a college or PhD to drop out, leading to a decrease in the probability of completing 15-18 years of schooling. These impacts on educational attainment are both statistically and economically significant.

6.2. Estimates of Political and Social Capital Outcomes

Now, we turn to estimating the impact of the dismissal and exile of Jewish professionals on political and social capital outcomes. The political outcome we will measure is an indicator variable of whether individual has a general interest in politics. On the other hand, as measures

of social capital, we will focus on individuals' trust and risk attitudes and whether they have worries about finance and worries about peace. A likely mediator for these long-run effects, especially in political outcome, is change in the social structure in German cities due to the dismissal and emigration of Jews. Historical accounts document that the overwhelming majority of Jewish population in Germany were highly educated and belonged to the middle class (Yahil, 1990). Thus, similar to relatively current genocides in Cambodia (de Walque, 2005) and Rwanda (de Walque and Verwimp, 2009), in Holocaust, Germany also lost the highly educated and middle class fraction of its population. The previous studies suggest that size of the middle class is important in promoting political development (Acemoglu, Hassan and Robinson, 2009).

Table 8 reports the difference-in-difference estimates for the political variable. The treatment and control groups described above for the education analysis also apply for this outcome. The outcome interest in Table 8 is a dummy variable for individual's general interest in politics which takes a value of 1 if individual reports that she/ he has a very strong or strong interest in politics and zero if individual has weak or no interest in politics. As summarized in Table 8, all specifications show that wartime destruction had a long-lasting, detrimental effect on individual's interest in politics that is significant at the 5% significance level. In Column (1), the difference-in difference estimate is -0.08 indicating that individuals, who experienced Holocaust, therefore lost a considerable fraction of the middle-class in their city are on average about 8 % less likely to have an interest in politics in adulthood than the others. Alternatively, in a comparison of Frankfurt and Bremen, the affected cohorts residing in Frankfurt had 23 % lower probability to show interest in politics relative to the same cohorts in Bremen. This is a sizable effect. For instance, Acemoglu, Hassan and Robinson (2009) find in Russia that cities more severely affected by the Holocaust have significantly greater support for communist candidates

in 1999 Duma elections and were more opposed to political reform more than 50 years after the end of the war. For specifically, they find that a one percentage point higher share of Jewish population in 1939 is associated with a 9.7% in increase in the vote share for communist candidates. On the other hand, Blattman (2009) shows that political participation in Uganda after civil conflict is greater, and that community networks are more extensive, in areas that have experienced violence. Bellows and Miguel (2006, 2009) provide similar evidence from Sierra Leone. However, we find that the severity of Holocaust decreases the individual's interest in politics. This difference between these studies and our findings may stem from the fact that during the Nazi Regime, Germany predominantly lost the educated fraction of its population who are overwhelmingly members of middle-class; however in Uganda and Sierra Leone, the burden of the civil conflicts was borne by the entire population in these countries. [16]

Table 9 presents the estimates for social capital outcomes and individual's preferences. We focus on individual's trust and risk attitudes, satisfaction with their current health status and whether individuals are worried about finance and peace. Individual's trust and risk attitudes are important as they determine people's propensity to invest and their ability to overcome social dilemmas, so that changes therein foster or hinder economic growth (Voors et al., 2010). Research in social psychology suggests that traits are relatively stable over time and across situations, nonetheless, they can profoundly change in response to traumatic events (as do coping strategies and states). The consensus view among psychologists is that a shock, such as Holocaust and WWII, may result in either temporal ("non-chronic") or permanent changes ("chronic" or "personality" changes or disorders) in behavior (McCrae, 2006). Also,

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[16] Similar to education analysis, Columns (2)-(4) report specifications incorporating parental human capital. D-D estimates summarized in these columns suggest that affected cohorts in cities with higher fraction of Jewish population are less likely to be interested in politics regardless of their parental background.

psychologists have pointed out that the disruption of support networks is a key damaging aspect of traumatic events (de Jong, 2002). If violence disrupts the social structure of the cities and communities, through permanent displacement or ethnic tensions, the breakdown of social support networks may occur. Therefore, shocks that attenuate preferences for social interaction and collaboration such as Holocaust may erode social capital and make communities less resilient against future shocks (undermining joint insurance) or hamper the provision of growth-enhancing collaborations and investment decisions.

The specification in Table 9 mimics that of Column (1) in previous tables. Column (1) of Table 9 reports the estimation results for individual's trust attitudes.[17] Using trust question in GSOEP, we generated a dummy variable for positive trust attitudes that takes a value of 1 if individual responded this question as "totally disagree" and "disagree slightly" and zero otherwise. Column (1) shows that dismissal of Jewish population has a negative effect on trust attitudes. It appears that affected cohorts in a city with an average fraction of Jewish population during the Nazi Regime (which is 1.13%) is about 10% less likely to trust people relative younger cohorts born in 1950s.

Column (2) reports the estimation results for individual's risk attitudes. Personal willingness to take risks in the GSOEP is measured on a scale from 0 to 10. Individuals are coded as willing to take risks if their response is 6 and above. Column (2) provides weak evidence suggesting that Holocaust caused Germans who were school aged to take fewer risks in adulthood; however, none of the effects are statistically significant in Column (2).

Column (3) estimates the effect of dismissal of Jewish professionals on self-reported health satisfaction using probit model. Health satisfaction is often considered to have significant

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[17] The GSOEP question based on which the individual's trust attitudes are identified in this paper is " Nowadays Can't Trust Anyone" with four possible responses "totally agree", "agree slightly", "disagree slightly" and "totally disagree".

explanatory power for predicting future mortality and is therefore a useful measure of morbidity (Idler and Benysmini, 1997; Frijters, Haisken-DeNew and Schields, 2005). Health satisfaction in the GSOEP is measured on a scale from 0 to 10. Individuals are coded as satisfied with their current health if their response is 6 and above. The results in Column (3) are negative and significant. Thus, dismissal of Jewish doctors does worsen long-run health status.

6.3. Estimates of Labor Market Outcomes

In this subsection, we analyze the effects of Holocaust on individual's labor market outcomes. An extensive literature has well documented the causal relation between individuals' human capital and labor market outcomes (see survey in Card, 1999; Case and Paxson, 2006). Given this well-established empirical evidence, the dismissal of Jews can impact individuals' labor market outcomes through reduction in educational attainment (summarized in Table 3) or through other channels, including change in the social structure and in the preferences of individuals towards investment and saving (reported in Table 9).

The outcome of interest in Table 10 is logarithm of hourly wage. This analysis is restricted to individuals with positive labor market earnings. We also dropped individuals who are older than 65 in 1985 from the analysis since the official retirement age in Germany is 65. More specifically, we dropped cohorts born between 1914 and 1919 from the analysis. Column (1) of Panel A shows that the difference-in-difference estimate for logarithm of hourly wage is -0.45. This suggests that children experienced the Holocaust earn about 50 % less in adulthood on average (this is the coefficient multiplied by the mean intensity of destruction). Consistent with aforesaid educational attainment results, Columns (2)-(4) in Panel A also point out that the

27

dismissal of Jewish population caused higher earnings loss for children from less favorable backgrounds.

Having shown that school-age children have lower future labor market earnings due to Holocaust, it is of interest to explore the channels underlying this causal association. Is the estimated effect of Holocaust on earnings working through decline in education or are there other channels at work? To investigate whether the Holocaust has effects on earnings besides through education channel, we estimate the same specification as in Panel A but add years of schooling as a regressor. Results are presented in Panel B of Table 10. This analysis suggests that although education explains a part of the earnings loss, the significant effects of Holocaust remains. This implies that decline in educational attainment is not the only channel for earnings loss arising from dismissal of Jewish professionals, leaving room for other channels such as change in the social structure and social networks after the exile and mass murder of Jews in Germany.

7. Conclusion

This paper provides causal evidence on long-term consequences of the dismissal and exile of the Jewish professionals on the educational attainment, labor market, political and social capital outcomes of German children. The findings in this paper shed light on the potential long-term legacies of large-scale human capital flight caused by armed conflicts and brain drain immigration. We combine a unique city-level dataset on the fraction of Jewish population residing in Germany during the Nazi Regime with individual survey data from the German Socio-Economic Panel (GSOEP) to study the unintended long-run effects of the dismissal and emigration of Jewish professionals on children's education, labor market, political and social capital outcomes. Our identification strategy exploits the plausibly exogenous city-by-cohort

variation in the intensity of Jewish population in Germany as a unique quasi-experiment. We find that the expulsion of Jewish professionals caused Germans who were school-aged during Nazi Regime to complete fewer years of schooling, be less likely to have a college or PhD degree, report lower interest in politics and lower satisfaction with their health, trust and take risks less and have lower labor market earnings in the future.

Taken together, these findings suggest that cities suffered severely by the expulsion of Jewish professionals not only experience deterioration in terms of local population and macroeconomic outcomes, but consequences of dismissal of Jewish professionals also prevail along human dimensions. Given that the detrimental effect of dismissal of Jewish professionals is still present five decades years after the Nazi Regime, these results underline the importance of policies targeting primarily school-age children after large-scale human capital flight.

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Table 1. Descriptive Statistics for Jewish Population in Germany

	All	Cities with above avg. Jewish pop.	Cities with below avg. Jewish pop.	Difference s.e(difference)	
	(1)	(2)	(3)	(4)	
% of Jews in 1933	1.128	1.851	0.683	1.169	***
	(0.716)	(0.614)	(0.273)	(0.021)	
% of Jews in 1946	0.121	0.211	0.066	0.145	***
	(0.204)	(0.256)	(0.138)	(0.009)	
Change in % of teachers	17.974	22.822	14.984	7.838	***
	(28.040)	(22.541)	(30.576)	(1.334)	
Area in km^2 in 1933	265.174	315.480	234.158	81.322	***
	(210.833)	(252.792)	(173.141)	(9.948)	
Population density in 1933	1,540.2	1,742.1	1,415.6	326.5	***
	(728.768)	(832.312)	(625.523)	(34.167)	
Population in 1933	404,913	509,378	340,507	168,870	***
	(356,622)	(343,238)	(349,539)	(16,671)	
Income per Capita in RM	465.552	498.644	445.149	53.495	***
	(106.361)	(68.283)	(119.699)	(4.954)	
Rubble per Capita	13.800	15.909	12.493	3.417	
	(6.987)	(8.032)	(5.887)	(3.263)	
N Max.	47	17	30	47	

Notes: The sample consists of 75 Regional Policy Regions (Raumordnungsregionen, ROR) in the former territory of West Germany. The means for destruction measures are weighted by population. Standard deviations are in parentheses.

Table 2. Descriptive Statistics, GSOEP Data

	All	Cities with above avg. Jewish pop.	Cities with below avg. Jewish pop.
	(1)	(2)	(3)
Years of Schooling	11.495 (2.402)	11.653 (2.545)	11.398 (2.305)
Has High School Diploma	0.598 (0.490)	0.595 (0.491)	0.600 (0.490)
Has More than High School Diploma	0.175 (0.380)	0.174 (0.379)	0.176 (0.381)
Interest in Politics	0.364 (0.481)	0.367 (0.482)	0.363 (0.481)
Self-Rated Health Satisfaction	0.536 (0.499)	0.533 (0.499)	0.538 (0.499)
Log of Hourly Wage	8.901 (0.957)	8.929 (0.934)	8.883 (0.972)
Mother with Basic Education	0.877 (0.328)	0.869 (0.338)	0.882 (0.322)
Father with Basic Education	0.817 (0.387)	0.801 (0.399)	0.826 (0.379)
Age	41.745 (17.585)	41.675 (17.409)	41.789 (17.700)
Female	0.529 (0.499)	0.526 (0.500)	0.530 (0.499)
Urban	0.630 (0.483)	0.622 (0.485)	0.635 (0.482)
N max.	1838	701	1137

Notes: Data are from 1985 GSOEP. The sample consists of individuals born between 1914 and 1960. Individuals born between 1924 and 1950 are dropped from the analysis since their exposure to the WWII destruction is not as clear. Standard deviations are presented in parentheses.

Table 3. Effects of Expulsion of Jewish Professionals on Years of Schooling

	(1)	(2)	(3)	(4)
Panel A: Percentage of Jews in 1933				
% of Jews in 1933 X Born btw.1914-1923	-0.433 ***	-0.340 ***	-0.295 **	-0.306 **
	(0.147)	(0.120)	(0.140)	(0.132)
% of Jews in 1933 X Born btw.1914-1923 X Father has more than Basic Education		0.331		0.409
		(0.392)		(0.471)
% of Jews in 1933 X Born btw.1914-1923 X Mother has more than Basic Education			0.404	-0.107
			(0.431)	(0.516)
R^2	0.178	0.304	0.277	0.327
N	1,816	1,567	1,590	1,544
Panel B: Change in the Jewish Population by 1946				
Change in Jewish Pop. X Born btw.1914-1923	-0.413 ***	-0.345 ***	-0.303 **	-0.327 **
	(0.134)	(0.115)	(0.134)	(0.123)
Change in Jewish Pop. X Born btw.1914-1923 X Father has more than Basic Education		0.399		0.457
		(0.426)		(0.494)
Change in Jewish Pop. X Born btw.1914-1923 X Mother has more than Basic Education			0.479	-0.067
			(0.473)	(0.556)
R^2	0.166	0.305	0.278	0.327
N	1,816	1,567	1,590	1,544

Notes: Standard errors clustered by cities are shown in parentheses. Asterisks denote significance levels (*=.10, **=.05, ***=.01). The control group is individuals born between 1951 and 1960. Each column is from a separate regression where main treatment effect varies by parental education in Columns (2)-(4). Each column controls for city and year of birth fixed effects. Columns (2)-(4) control for main effects of parental human capital. Other controls in each regression are gender and rural dummies.

Table 4. Effects of Expulsion of Jewish Professionals on Probability of Moving

	(1)	(2)	(3)	(4)
Panel A: Percentage of Jews in 1933				
% of Jews in 1933 X Born btw.1914-1923	-0.054	-0.051	-0.053	-0.046
	(0.035)	(0.034)	(0.035)	(0.034)
% of Jews in 1933 X Born btw.1914-1923 X Father has more than Basic Education		0.041		0.054
		(0.068)		(0.086)
% of Jews in 1933 X Born btw.1914-1923 X Mother has more than Basic Education			0.035	-0.031
			(0.096)	(0.116)
R^2	0.135	0.170	0.155	0.167
N	1,814	1,567	1,590	1,545
Panel B: Change in the Jewish Population by 1946				
Change in the Jewish Pop. X Born btw.1914-1923	-0.046	-0.046	-0.048	-0.043
	(0.031)	(0.033)	(0.034)	(0.032)
Change in the Jewish Pop. X Born btw.1914-1923 X Father has more than Basic Education		0.046		0.057
		(0.073)		(0.090)
Change in the Jewish Pop. X Born btw.1914-1923 X Mother has more than Basic Education			0.048	-0.019
			(0.104)	(0.126)
R^2	0.134	0.170	0.155	0.327
N	1,814	1,567	1,590	1,545

Notes: Standard errors clustered by cities are shown in parentheses. Asterisks denote significance levels (*=.10, **=.05, ***=.01). The control group is individuals born between 1951 and 1960. Each column isa from separate regression where main treatment effect varies by parental education in Columns (2)-(4). Each column controls for city and year of birth fixed effects. Columns (2)-(4) control for main effects of parental human capital. Other controls in each regression are gender and rural dummies. Individuals are coded as movers if they report that that they no longer reside in their childhood city or area.

Table 5. Effects of Expulsion of Jewish Professionals on Years of Schooling

	Non-Movers Only			
	(1)	(2)	(3)	(4)

Panel A: Percentage of Jews in 1933

	(1)	(2)	(3)	(4)
% of Jews in 1933 X Born btw.1914-1923	-0.467 ***	-0.451 ***	-0.310 **	-0.363 ***
	(0.183)	(0.103)	(0.142)	(0.106)
% of Jews in 1933 X Born btw.1914-1923 X Father has more than Basic Education		0.120		0.318
		(0.413)		(0.355)
% of Jews in 1933 X Born btw.1914-1923 X Mother has more than Basic Education			-0.340	-0.642
			(0.671)	(0.568)
R^2	0.195	0.287	0.277	0.316
N	1,020	879	891	869

Panel B: Change in the Jewish Population by 1946

	(1)	(2)	(3)	(4)
Change in the Jewish Pop. X Born btw.1914-1923	-0.557 ***	-0.527 ***	-0.388 ***	-0.442 ***
	(0.161)	(0.101)	(0.137)	(0.110)
Change in the Jewish Pop. X Born btw.1914-1923 X Father has more than Basic Education		0.203		0.395
		(0.467)		(0.392)
Change in the Jewish Pop. X Born btw.1914-1923 X Mother has more than Basic Education			-0.285	-0.572
			(0.785)	(0.657)
R^2	0.189	0.288	0.277	0.316
N	1,020	879	891	869

Notes: Standard errors clustered by cities are shown in parentheses. Asterisks denote significance levels (*=.10, **=.05, ***=.01). The control group is individuals born between 1951 and 1960. Each column is from separate regression where main treatment effect varies by parental education in Columns (2)-(4). Each column controls for city and year of birth fixed effects. Columns (2)-(4) control for main effects of parental human capital. Other controls in each regression are gender and rural dummies.

Table 6. Effects of Expulsion of Jewish Professionals on Years of Schooling

	Control Experiment			
	(1)	(2)	(3)	(4)
% of Jews in 1933 X Born btw.1900-1906	-0.127	-0.111	-0.208	-0.135
	(0.132)	(0.111)	(0.130)	(0.119)
% of Jews in 1933 X Born btw.1900-1906 X Father has more than Basic Education		-0.343 (0.298)		-0.321 (0.384)
% of Jews in 1933 X Born btw.1900-1906 X Mother has more than Basic Education			-0.541 (0.320)	-0.332 (0.414)
R^2	0.279	0.434	0.423	0.465
N	523	403	404	400

Notes: Standard errors clustered by cities are shown in parentheses. Asterisks denote significance levels (*=.10, **=.05, ***=.01). Sample consists of older cohorts who were born between 1900 and 1913 who would have completed their schooling at the outset of WWII. "Placebo" affected group is individuals born between 1900 and 1906 and "Placebo" control group is individuals born between 1907 and 1913. Each column is from a separate regression where main treatment effect varies by parental education in Columns (2)-(4). Each column controls for city and year of birth fixed effects. Columns (2)-(4) control for main effects of parental human capital. Other controls in each regression are gender and rural dummies.

Table 7. Effects of the WWII Exposure on Years of Schooling

	(1)	(2)	(3)	(4)
Rubble per Cap. X Born btw.1914-1923	-0.014	-0.001	-0.003	0.000
	(0.020)	(0.019)	(0.017)	(0.018)
Rubble per Cap. X Born btw.1914-1923 X Father has more than Basic Education		0.023 (0.031)		0.016 (0.032)
Rubble per Cap. X Born btw.1914-1923 X Mother has more than Basic Education			0.030 (0.040)	0.003 (0.041)
R^2	0.174	0.302	0.264	0.325
N	1,810	1,562	1,585	1,539

Notes: Standard errors clustered by cities are shown in parentheses. Asterisks denote significance levels (*=.10, **=.05, ***=.01). The control group is individuals born between 1951 and 1960. Each column is from separate regression where the main treatment effect varies by parental education in Columns (2)-(4). Each column controls for city and year of birth fixed effects. Columns (2)-(4) control for main effects of parental human capital. Other controls in each regression are gender and rural dummies.

Table 8. Effects of Expulsion of Jewish Professionals on General Interest in Politics

	(1)	(2)	(3)	(4)
Panel A: Percentage of Jews in 1933				
% of Jews in 1933 X Born btw.1914-1923	-0.080 ***	-0.092 **	-0.083 **	-0.090 **
	(0.029)	(0.031)	(0.035)	(0.039)
% of Jews in 1933 X Born btw.1914-1923 X Father has more than Basic Education		0.018		0.042
		(0.052)		(0.077)
% of Jews in 1933 X Born btw.1914-1923 X Mother has more than Basic Education			0.007	-0.047
			(0.085)	(0.118)
R^2	0.093	0.127	0.121	0.131
N	1,808	1,558	1,581	1,535
Panel B: Change in the Jewish Population by 1946				
Change in the Jewish Pop. X Born btw.1914-1923	-0.084 ***	-0.094 ***	-0.088 ***	-0.096 **
	(0.027)	(0.036)	(0.035)	(0.038)
Change in the Jewish Pop. X Born btw.1914-1923 X Father has more than Basic Education		0.016		0.043
		(0.057)		(0.081)
Change in the Jewish Pop. X Born btw.1914-1923 X Mother has more than Basic Education			-0.009	-0.063
			(0.091)	(0.125)
R^2	0.093	0.127	0.122	0.131
N	1,808	1,558	1,581	1,535

Notes: Standard errors clustered by cities are shown in parentheses. Asterisks denote significance levels (*=.10, **=.05, ***=.01). The control group is individuals born between 1951 and 1960. Each column controls for city and year of birth fixed effects. Other controls in each regression are gender and rural dummies.

Table 9. Effects of Expulsion of Jewish Professionals on Social Capital Outcomes

	Trust	Risk	Current Health Satisfaction	Worried about Finance	Worried about Peace
	(1)	(2)	(3)	(4)	(5)

Panel A: Percentage of Jews in 1933

	Trust	Risk	Current Health Satisfaction	Worried about Finance	Worried about Peace
% of Jews in 1933 X Born btw.1914-1923	-0.099 **	-0.152	-0.064 **	-0.067 **	-0.070 **
	(0.050)	(0.102)	(0.027)	(0.035)	(0.032)
R^2	0.086	0.140	0.135	0.113	0.107
N	694	604	1,832	709	765

Panel B: Change in the Jewish Population by 1946

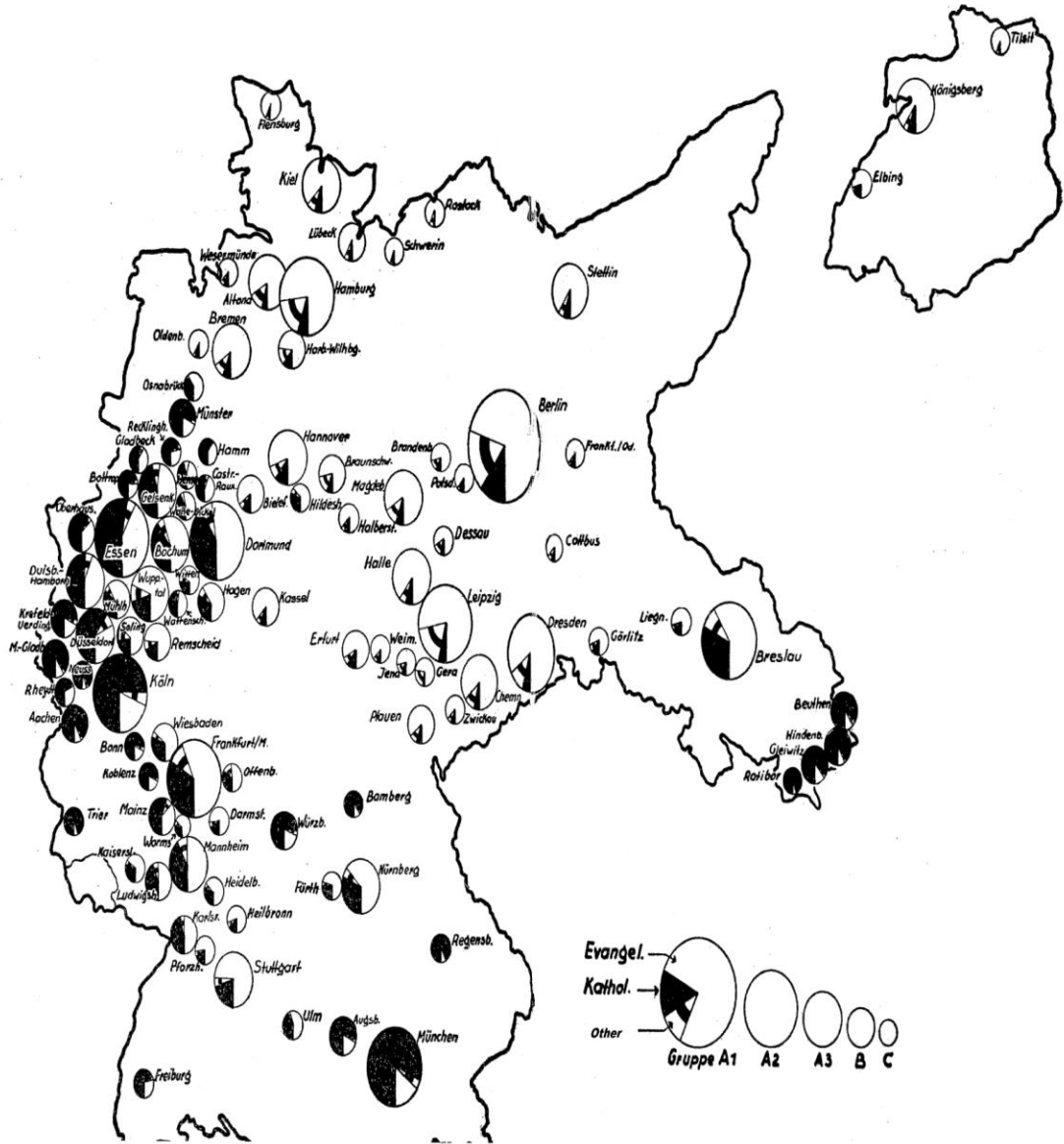|	Trust	Risk	Current Health Satisfaction	Worried about Finance	Worried about Peace
Change in the Jewish Pop. X Born btw.1914-1923	-0.099 **	-0.089		-0.118 **	-0.077 **
	(0.048)	(0.082)		(0.052)	(0.044)
R^2	0.084	0.139		0.117	0.107
N	694	604		709	765

Notes: Standard errors clustered by cities are shown in parentheses. Asterisks denote significance levels (*=.10, **=.05, ***=.01). The control group is individuals born between 1951 and 1960. Each column controls for city and year of birth fixed effects. Other controls in each regression are and rural dummies. Each column is from a separate regression.

Table 10. Effects of Expulsion of Jewish Professionals on Labor Market Outcomes

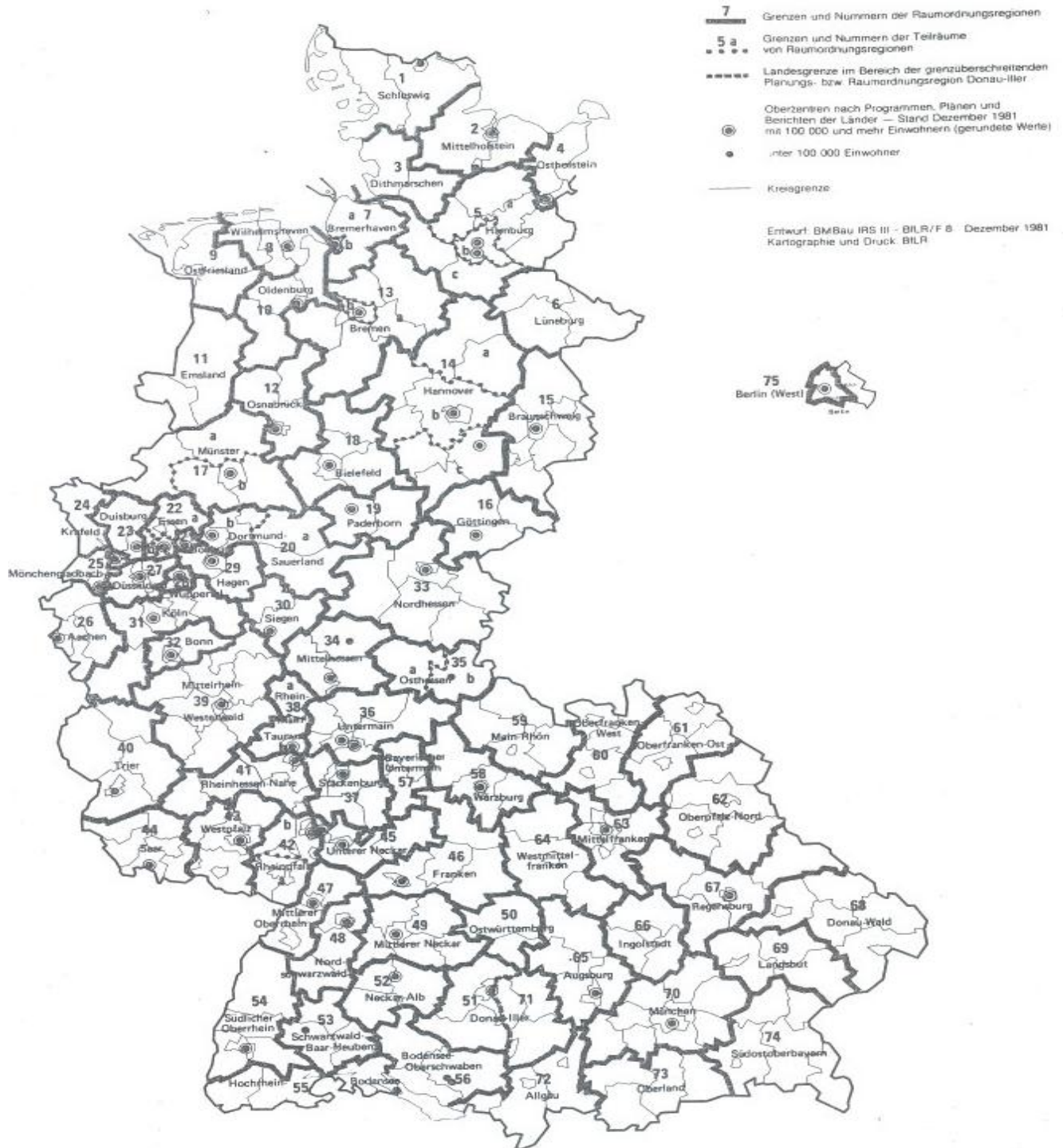|	(1)	(2)	(3)	(4)
Panel A: Logarithm of Hourly Wage				
% of Jews in 1933 X Born btw.1920-1923	-0.449 ***	-0.581 ***	-0.587 ***	-0.595 ***
	(0.116)	(0.116)	(0.122)	(0.120)
% of Jews in 1933 X Born btw.1920-1923 X Father has more than Basic Education		0.832 ***		-0.780 **
		(0.212)		(0.339)
% of Jews in 1933 X Born btw.1920-1923 X Mother has more than Basic Education			1.091 ***	1.719 ***
			(0.221)	(0.363)
R^2	0.298	0.337	0.331	0.340
N	883	772	782	761
Panel B: Logarithm of Hourly Wage, Controlling for Education				
% of Jews in 1933 X Born btw.1920-1923	-0.400 ***	-0.570 ***	-0.577 ***	-0.589 ***
	(0.106)	(0.112)	(0.120)	(0.118)
% of Jews in 1933 X Born btw.1920-1923 X Father has more than Basic Education		0.720 ***		-0.876 ***
		(0.216)		(0.317)
% of Jews in 1933 X Born btw.1920-1923 X Mother has more than Basic Education			0.978 ***	1.723 ***
			(0.246)	(0.355)
R^2	0.322	0.352	0.353	0.358
N	879	769	779	758

Notes: Standard errors clustered by cities are shown in parentheses.

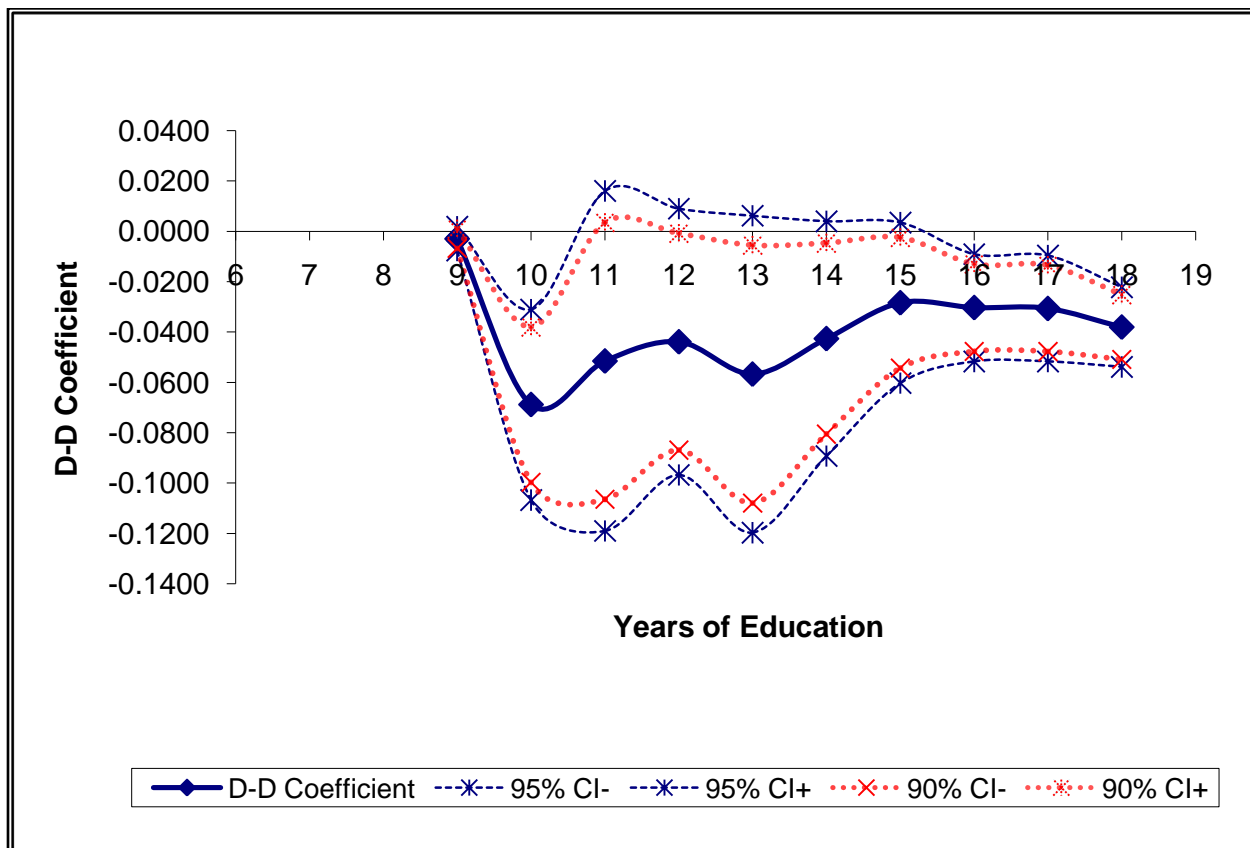**Figure 1: Share of Jewish Population in German Cities in 1933**

Source: German Statistical Yearbook (1935)

Figure 2: Map of Regional Policy Regions (*Raumordnungsregionen*, ROR) in West Germany

Source: Federal Office for Building and Regional Planning (*Bundesamt für Bauwesen und Raumordnung*, BBR). There are 75 regional policy regions (RORs) in former West Germany. The darker the region, the more wartime destruction it experienced.

Figure 3: Estimated Effect of Jewish Professionals' Expulsion on Full Distribution of Education

Notes: Each point in this figure is difference-in-difference estimate from a separate regression where the outcome is a dummy variable that takes a value of 1 if individual completed *m* years of schooling or more and zero otherwise. In my sample, individuals complete between 7 and 18 years of schooling.