Economic Consequences of Political Persecution*

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Abstract

We analyze the effects of persecution and labor market discrimination during the communist regime in the former Czechoslovakia using a representative life history sample from the Survey of Health, Ageing and Retirement in Europe. We find strong effects of persecution and dispossession on subsequent earnings, with most severe implications of job loss due to persecution on earnings in subsequent jobs and on career degradation. Accumulated long-term effects in the form of initial retirement pensions paid during the communist regime are even greater. These pension penalties disappear by 2006 largely as a result of compensation schemes implemented by democratic governments after 1989. We use unique administrative data on political rehabilitation and prosecution to instrument for the endogenous variables. Finally, we survey transitional justice theory and document reparations programs in other countries.

JEL Classification: N34, J70, J31, C21
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1 Introduction

In a country where the sole employer is the State, opposition means death by slow starvation. The old principle: who does not work shall not eat, has been replaced by a new one: who does not obey shall not eat.

Leon Trotsky (1937)

It was a well known anecdote in the 1980s that Prague had the most educated window cleaners in the world. Indeed, the first post-communist president of Czechoslovakia Václav Havel had been rolling barrels in a brewery, the Prime Minister Petr Pithart had worked as a stoker, a night watchman, and a forest worker, while the Secretary of State Jiří Dienstbier had been a tube cutter, a book packer, and a window cleaner. All had higher education, were active dissidents, imprisoned by the regime and fired from their original occupations. In this paper, we address the following questions: Do these well known case studies reflect the experience of ordinary individuals who were persecuted by the communist regime? In particular, what were the labor market consequences of political persecution in terms of career degradation, earnings losses as well as cumulated losses in the form of retirement benefits? And, is it possible to successfully compensate such victims of persecution? To our best knowledge our paper is the first to address these issues directly in a quantitative manner.

Over twenty five years after the "velvet" revolution in Czechoslovakia little is still known about the consequences of the communist regime's oppression on the well-being of the population. This applies both to the question of well-being at the time as well as to the long term consequences of the years spent under communism. Lack of quantitative studies also applies to evidence on the nature and functioning of the labor market, which under the communist regime was a subject to very tight state control through the process of wage determination, job allocation, and ability of the government to affect different aspects of quality of work. The workplace was often the area where the power of the state over the individual presented itself most clearly.

For the purpose of our analysis we use data from the Czech sample of the Survey of Health, Ageing and Retirement in Europe (SHARE) in the life history SHARELIFE module conducted in 2008.[1] Detailed information on the experience of persecution contained in this module is combined with a rich set of data on respondents' employ-

[1]The Survey of Health, Ageing and Retirement in Europe (SHARE) is a multidisciplinary and cross-national representative panel of micro data on health, socio-economic status and social and family networks of more than 60,000 individuals aged 50+ and their partners in 20 European countries. The survey is harmonized with the Health and Retirement Study (HRS) and the English Longitudinal Study of Ageing (ELSA). For more information about SHARE see www.share-project.org.

ment, earnings and pensions history. In a recent paper (Bohacek and Myck (2011)) we show that general outcomes such as health, career and life satisfaction correlate strongly with past experiences of persecution. This is despite the passage of time, the years lived under the new democratic regime and despite the fact that we can only examine these issues among those who survived at all or long enough to participate in the survey. These factors imply that any effects we find are most likely lower bounds of the true effects.

In the representative sample of the SHARELIFE survey in the Czech Republic we still find a significant proportion, more than 11 percent, of those who declare experiencing persecution. The data confirm the disproportional burden of persecution that fell on the higher educated people in the former Czechoslovakia. Among the persecuted individuals a third have higher education, compared to the overall average of 18 percent. Among those who experienced a persecution-related job loss, 67 percent have higher education. The structure of the SHARELIFE interview allows us to identify persecution in specific jobs and thus to analyze the effects of job-related persecution on earnings in the subsequent jobs and its long term consequences in terms of pensions. We show that earnings of individuals who had lost a job due to persecution were subsequently more than 30 percent lower (controlling for childhood and other individual characteristics). The accumulated long-term consequences in terms of retirement pensions were even greater: initial benefits assigned according to the rules set by the communist regime were reduced by more than 40 percent. The magnitude of these effects is remarkable given the otherwise egalitarian nature of the communist system. These results document the regime's high degree of control over people's daily lives and its power to punish dissenting individuals. Interestingly, these long-term consequences in terms of pensions disappear seventeen years after the fall of communism, largely as a result of effective compensation policies implemented after 1989.

Our results may be biased due to the potential endogeneity of persecution which may result, on the one hand, from self-selection into opposition during communism, and on the other, from trying to justify own failures in the labor market by blaming the old regime. To account for this we use unique data which reflect the intensity of persecution over time to instrument persecution declared at individual level in the SHARE data. Our instruments derive from a database of court decisions on rehabilitation of victims and on prosecution of former officials of the communist regime. The respondent's declaration of losing his or her job due to persecution at a specific point in time ought to be correlated with the severity of oppression in the same year,

which is represented by the number of rehabilitation and prosecution cases identified in that year. At the same time the overall intensity of persecution over time should not be related to other unobserved characteristics at individual level which could be the source of endogeneity bias in our simple OLS estimates.

Additionally, in the online Appendix we test the robustness of our estimates for the role of unobserved heterogeneity (Altonji et al. (2005)), omitted variables (Oster (2013)), and provide alternative estimates based on matching estimators (Blundell and Costa Dias (2009) and Imbens and Wooldridge (2009)). Finally, since our results rely on retrospective information and persecution may reflect recall or justification biases, we analyze earnings and pensions recall as well as placebo regressions. All these tests confirm the robustness of our results and the significant negative effects of job-related persecution on earnings in subsequent jobs and on initial pensions.

The contribution of this paper is threefold. First of all, we use micro data for documenting how the communist economic system, one of the most important socio-economic phenomena of the last century, affected the lives of millions of people. From a historical perspective, our paper is related to the recent literature on the long-term effects of World War II and the Holocaust. Acemoglu et al. (2011) find that Russian cities and regions that experienced the Holocaust most intensely have grown less, have lower wages and GDP per capita today as well as exhibit a higher vote share for communist candidates since the collapse of the Soviet Union. Voth and Voigtlander (2012) study the persistence of anti-semitism during World War II. Waldinger (2013) compares the destruction of human and physical capital of scientific departments in Germany during World War II and shows that in the short-run, the human capital shock lowered output by about four times more than the physical capital shock and that only the former persisted in the long-run.[2] However, all these papers use aggregate or regional information related to these historical events. The only exception is Smith et al. (2014) who, also using the information in the SHARELIFE dataset, find that childhood events related to World War II shocks, such as combat exposure and periods of hunger, significantly predict health and economic outcomes at older ages.

Second, we document the effects of discrimination in a politically controlled labor market. Economic theory suggests that in competitive labor markets wages should

[2]Davis and Weinstein (2002) show that the U.S. bombing of Japanese cities during World War II had no long run impact on the population of those cities relative to prewar levels. Brakman and Schramm (2004) find a similar result for West Germany but not for East Germany. This significant difference can be explained by the lack of private incentives for rebuilding (property was nationalized), government priority to rapid industrialisation as well as the regime's desire to destroy the remnants of the old Germany.

only reflect workers' marginal product of labor. Empirical research, however, consistently finds wage "penalties" related to various observable characteristics, primarily to race and gender. The reason for these penalties is frequently associated with labor market discrimination, namely a situation in which individuals of equal productivity are treated differently.[3] However, plain wage differentials are insufficient as proofs of discrimination. Shifting the question of discrimination to earlier stages of life, Heckman (1995), Neal and Johnson (1996), or Carneiro et al. (2005) show that the wage gap can be traced largely to a difference in basic skills that pre-dates entry into the labor market.[4] Another potential explanation for wage differentials stems from the employers' side who, given limited information about the skills and turnover propensity of applicants, can have incentives to use easily observable characteristics such as race or gender to statistically discriminate among workers if these characteristics are correlated with performance (Phelps (1972), Arrow (1973), Farber and Gibbons (1996) and Altonji and Pierret (2001)). A substantial part of wage differentials can also be explained by job characteristics, preferences for specific type of employment or institutional constraints (Becker (1957), Macpherson and Hirsch (1995), Goldin (1990), or Blau and Kahn (1997)). We relate our results on job losses due to persecution to the literature on displaced workers in the U.S. and Europe (Neal (1995), Jacobson et al. (1993), or Poletaev and Robinson (2008)) and provide one of the first insights on the long-term effects of displacement on retirement benefits.

Wage differentials can finally be seen as departures from competitive labor markets. Recent evidence by Black and Strahan (2001) confirms that employers operating in non-competitive product markets have much more scope to reward their employees along other criteria than productivity. Wage premia of union members have been estimated at about 12 percent in OECD countries and 18 percent in the United States (Card (1996), Card et al. (2004), and Blanchflower and Bryson (2002)). In the Chinese labor market, perhaps the closest institutional scenario to that in our paper, Appleton et al. (2009) find a substantial wage premium of about 10-14 percent from being a member of the Chinese Communist Party. We must remember though that, except perhaps for the last example, the labor environment during the communist rule had little in common with labor markets studied in the economic literature. Until the fall of the regime in 1989 the government had full control over the allocation of individuals to

[3]Ashenfelter (1972), Card and Krueger (1993), and Fryer (2010) document that the relative mean black-white earnings ratio in the United States has narrowed from 0.6 in 1960s to 0.75 in 1990s.

[4]We control for childhood characteristics and household conditions at age ten. Further details on economic theory and empirical results can be found in the surveys of Cain (1986), Darity and Mason (1998) or Altonji and Blank (1999).

jobs and the level of wages. The totalitarian nature of the regime gave the employer—i.e. the state—complete power to discriminate along the characteristics of its choosing. This feature of the labor market allows us to use unique historical data on intensity of oppression as instruments for job losses due to persecution to address the issue of potential endogeneity of the experience of persecution at individual level.

The third contribution of the paper is new evidence in the area of transitional justice, important for our understanding of successful compensation policies for political discrimination and oppression (Acemoglu and Robinson (2006), Carneiro et al. (2005), or Heckman (1998)). Our results show that while the effects on earnings and initial retirement benefits were substantial, the compensation policies introduced in the Czech Republic after 1989 have proven effective in nullifying the effect of persecution on the level of current pensions. The Czech Republic was one of the few countries that compensated victims of political persecution in the labor market. Conforming to the Development Through Justice theory, the adopted restorative and punitive transitional justice mechanisms have emphasized the rule of law even at the cost of delaying economic transformation (Elster (2006) and De Greiff (2006)). Olsen et al. (2011) also emphasize this approach to transitional justice for its role in economic transition and long-run development. Our results are important for future reparation policies in other countries as a large fraction of the world population still lives or had spent a substantial part of its life in countries with an authoritarian regime. We document in Section 6 the growing domestic and international pressure on governments to provide similar reparations for harms inflicted in the past.

The paper is organized as follows. In Section 2 we briefly document periods of the most intensive deprivation of rights and freedoms in Czechoslovakia between the end of World War II and 1989 and describe the economic system. Section 3 presents the structure of the SHARELIFE interview and describes the dataset. In Section 4 we study the determinants of persecution and its effects on earnings, career degradation, and pensions. Instrumental variables estimation is presented in Section 5. Theory of transitional justice and compensation policies are described in Section 6. Section 7 concludes the paper. Finally, Online Appendices contain supplementary material on data, statistical analysis, and legislation. Data and the analyses of recall and justification bias are in Appendix A. Appendix B presents robustness tests for selection on unobservables, omitted variables, and results of matching estimators. Instrumental variables estimation is described in Appendix C. Appendix D displays relevant sections of the SHARELIFE questionnaire while Appendix E explains the pension system and

important legislation related to persecution.

2 A Brief Historical Background

Respondents in the SHARE sample in the Czech Republic have spent most of their lives under the communist regime in Czechoslovakia between 1948 and 1989. The communist rule exerted significant pressure on the lives of not only those who actively opposed or questioned the legality of the regime but also of those the regime targeted for political reasons, class origin (former entrepreneurs, land owners, intelligentsia), religion, for having family members who had emigrated, or for any other characteristics the totalitarian regime found convenient. Importantly, as a rule, the whole family would suffer with its targeted member: children of persecuted parents could not attend high school or university, family members were denied access to jobs they were qualified for or even imprisoned. Persecution was a life changing experience with long-term consequences.

2.1 Persecution between 1948 and 1989

The intensity of the state oppression varied greatly over time. Table 1 presents conservative estimates of the worst cases of persecution. The most intense period of persecution occurred from 1948 till the end of 1950s with a large fraction of the population affected by imprisonment, political trials, dispossession, forced collectivization, resettlement, labor camps, and other acts of violence. During this period more than 15,000 people were murdered or died as a direct consequence of persecution (Kaplan (1992)).[5] Just within two years in 1950 and 1951, there were 48,485 prison and labor camp sentences (Kaplan (1994)). In the 1940s, 1950s and even 1960s, persecution was usually not the consequence of an individual's choice but rather of a chance of belonging to a particular social group, practicing a religion, or being born into a household with certain characteristics. It was a matter of survival, long-term incarceration and hard persecution of close relatives. Milder forms of persecution included the loss of occupation, denied access to education, or deprivation of civil rights.

INSERT TABLE 1 AROUND HERE

After a brief interlude of relative freedom in 1967 and 1968 during the Prague Spring, the Soviet occupation of Czechoslovakia led to massive emigration and another

[5]The numbers in the Table 1 are almost certainly lower than the real losses for the lack of preserved materials from the 1950s. The estimate of total deaths include those who died shortly after their release from prison or labor camps (see Courtois et al. (1999)).

wave of persecution that lasted till the fall of the regime in 1989. This last phase of persecution took less severe forms relative to the 1950s but affected a significant proportion of the population. It is estimated that around 280,000 individuals lost their jobs during 1970s and 1980s (Courtois et al. (1999)). In this late period of the post-Stalinist, more appeasing communist system, individuals were persecuted because they actively opposed or demonstratively boycotted the communist regime. Thus for most of the persecuted people in the 1970s and 1980s, the risk of persecution often became a choice: it was a question of risking to lose a job, to damage own professional career or to suffer other restriction including access to education which often affected the entire family. At all times, individuals had to conduct their lives with the overpowering state strongly limiting their freedoms and using various forms of direct and indirect oppression.[6]

2.2 The Economic System

Czechoslovakia belonged among the most industrialized countries before World War II. Figure 1 shows that GDP per capita in Czechoslovakia was comparable to that of Austria, a country with which it shared most of its modern history as well as its socio-economic conditions and institutions. From the end of World War II, Czechoslovakia and East European countries display a drastically different development compared to the West.

INSERT FIGURE 1 AROUND HERE

The Soviet-type economic system was characterized by central planning, full employment (not having a job was considered a crime) as well as centrally set wages, prices and output targets for state-owned enterprises. The communist regime imposed nationalization of production, heavy industrialization, and collectivization of agriculture: virtually all private productive property, including land, was confiscated without retribution (see Kuklik (2010)). Central planning operated through 5-year output and investment plans, centralized financial flows, soft budget constraints and foreign trade integrated within the Soviet-bloc trading area, the COMECON. The totalitarian regime exerted full and exclusive control of job assignment, wages, pensions as well as allocation of investment, housing, education, and the supply of all goods and services. Due to centrally planned allocations and prices, the system displayed vast degree of shortages and inefficiency. Ray (1991) shows that the productivity in

[6]For a general overview of Czechoslovak history during the 20th century see Courtois et al. (1999), Naimark (1998), Snyder (2010), or Davies (2005).

Central and Eastern European countries in mid-1980s ranged from around a third to half of that in OECD countries. There was virtually no association between wages and performance and there was substantial over-employment and labor hoarding estimated at 15-30 percent of the total working time (Nesporova (1999)). Income distribution was maintained at relatively egalitarian levels with the Gini coefficient of earnings estimated at around 0.2 in 1987 (Rutkowski (1996)). Incentives with respect to skills improvement and R&D investment were minimal and output growth typically reflected a more extensive use of inputs. In 1989, after forty years of the communist experiment, the ratio of Czechoslovak to Austrian real GDP per capita was 0.48 (see Figure 1).

Czechoslovakia became a democratic country with an open market economy in the fall of 1989. The Czech Republic separated from Slovakia in 1993 and joined the European Union in 2004.

3 Documenting Persecution in SHARE Data

In this Section we describe the data from the Czech sample of the Survey of Health, Ageing and Retirement in Europe (SHARE), a longitudinal survey of a representative sample of individuals aged 50+ years and their partners. We use the baseline SHARE survey in 2006 and the retrospective SHARELIFE life history interview collected on the same sample in 2008 (see Appendix D for further details).

3.1 Identification of Persecution

The principal sections of the SHARELIFE interview covered details of family, labor market and health history, childhood living conditions, and health care. The labor market history module recorded several key characteristics of respondents' jobs, such as the year of starting and ending a job, the job's title and industry, and whether it was full-time or part-time employment. Additionally, individuals were asked to give the starting earnings in each of the jobs they had. On the basis of this information we can recreate the entire path of job spells. For pensioners the data also provide information on the value of the initial retirement pension and the year they retired.

In the final part of the interview, after details of job and life history had been recorded, respondents were asked a set of general questions concerning major life experiences, including a section focused on the experience of persecution:

There are times in which people are persecuted or discriminated against, for example because of their political beliefs, religion, nationality, ethnicity, sexual orientation or their background. People may also be persecuted or discriminated against because

of political beliefs or the religion of their close relatives. Have you ever been the victim of such persecution or discrimination?

Conditional on a positive answer to this question followed a series of detailed items on the form and immediate consequences of persecution: whether the experience of persecution 1) ever forced the individual to stop working in a job, and whether it 2) resulted in an experience of denied promotions, assignment to a task with fewer responsibilities, working on tasks below one's qualifications, harassment by a boss or colleagues, or pay cuts. In a follow-up question respondents were asked to match the specific form of persecution they suffered with jobs they had previously listed in the labor market history section. Additionally, respondents were asked if they or their families were ever dispossessed of their property as a result of persecution and if so then in which year it happened.[7]

Building on the treatment effects literature (Blundell and Costa Dias (2009), Heckman et al. (1998), and Imbens and Wooldridge (2009)), we analyze the following six treatments:

1. "Persecution" — general experience of being persecuted;
2. "Dispossession" — being dispossessed of property as a result of persecution;
3. "Job loss due to persecution" — persecution-related job loss;
4. "Job discrimination" — persecution-related discrimination in the workplace;
5. "Layoff" — being laid-off for a reason other than persecution; and
6. "Displacement" — losing a job due to plant closure or downsizing.

The last two treatments are not related to persecution and serve as reference points for the comparison of persecution effects with general labor market experiences and the literature on displaced workers (see Jacobson et al. (1993) and Gibbons and Katz (1991)).

As we are aware of the concern about the quality of recall data, we show in Appendix A that there is no correlation between these treatments and the probability of recalling earnings or pensions.[8] Additionally, the structure of the interview limits the potential for endogeneity and justification bias. First, the identification of any job-related persecution is initially screened through the general persecution question and respondents answering this general question do not know that questions on job-related persecution will follow. Second, the persecution section is at the end of the interview, separated from the labor market and earnings history section by a significant number

[7]We show in Bohacek and Myck (2011) that the distribution of dispossession over time closely reflects the main political developments in the country's history.

[8]Smith (2009) documents that the quality of recall of salient events is usually very precise.

of questions on other issues. This means that respondents first provide details of their labor market history, earnings, and pensions, and only at the end of the interview identify jobs in which they experienced persecution and which they lost as a result. Finally, we deal with the issue of potential endogeneity of treatment by instrumenting declared experience of persecution with external information on the intensity of oppression over time (see Section 5). Additionally, we conduct several robustness tests which are presented in Appendix B where we use the methodology of Altonji et al. (2005) and Oster (2013). Our IV results as well as the robustness tests show that the main conclusions drawn in the paper using simple OLS regression are not strongly affected by self-selection into treatment and justification bias, and are robust to more general forms of unobserved heterogeneity.

3.2 Sample Statistics

In the SHARELIFE 2008 survey, a representative sample of 1,846 people aged 50+ was interviewed in the Czech Republic. This is the longitudinal part of the sample which took part in the first baseline SHARE survey in 2006 (Börsch-Supan et al. (2011)). In the sample selection for our analysis, we apply several criteria dictated by the nature of the problem we study. First of all, because we look at the oppressive nature of the communist regime, we only include individuals who started their working careers and received wages as employees before 1990.[9] We also keep only those respondents who gave valid information for all the variables we include in the analysis. This leaves us with the total of 1,521 individuals.

INSERT TABLE 2 AROUND HERE

In Table 2 we present descriptive sample statistics for our full sample (column 1) and separately show statistics for the treated subsamples (columns 2-7) for which we indicate whether the computed mean for the treated group is statistically different from its respective non-treated, complementary sample. About 11.5 percent of respondents in the sample reported the experience of being subject to persecution. A slightly higher percentage, 13.4 percent, declared dispossession.[10] Over the course of respondents' labor market careers 3.1 percent experienced job loss due to persecution, while 6.1

[9] In the fully nationalized economy, all persons received wages including those in agricultural sector as members of farm cooperatives.

[10] Nationalization (with compensation) of some firms with more than 50 employees, large industrial firms, banks, insurance, and of large landowners occurred already in 1946-1947 based on presidential decrees 100-104/1945. These acts might not have been perceived as persecution. A complete confiscation of all productive property and real estate without compensation took place between 1948-1956.

percent endured other forms of discrimination at work such as denied promotions or harassment. Finally, 4.6 percent of the respondents were ever laid-off and 16.4 percent displaced. The overall sample is composed by 43 percent of males and 57 percent females, due to the higher longevity of the latter. About 18 percent of the whole sample have higher education, and more than 64 percent attained secondary education.[11]

We use several variables to reflect and document respondents' conditions at birth or in early childhood. These variables, which are important controls given the problem of potential self-selection into persecution, indicate the family background and childhood household conditions when respondents were aged 10. The first category of variables contains information on being born within the country's current borders (*"Born in country"*), in a village (*"Birthplace: village"*) or in a big city (*"Birthplace: big city"*) as well as whether the household in which the respondent was born owned their residence (*"Birthplace: owner"*). The childhood variables include the number of books at home at the age of 10 (*"Age 10: no books"*—no books or up to one shelf of books at home), while household conditions cover such information as lacking basic facilities (inside toilet, running water supply or central heating; *"Age 10: no facilities"*), and a low ratio of rooms over the number of people in the household (*"Age 10: low room"*—ratio lower than 0.5). Parental information at age 10 include living with both parents (*"Age 10: parents"*), and having a father in white-collar occupation (*"Age 10: white collar"*).[12]

3.3 Treatment in the Sample Statistics

Given the nature of the communist regime, the declared leading role of the working class, and the predominantly highly educated opposition to the regime in Czechoslovakia, one would expect a significant relationship between the experience of persecution and a respondent's level of education. This is indeed the case in the data. While there is about 18 percent of respondents with higher education in the whole sample, this proportion rises to 1/3 among those who experienced persecution and to 48.3 percent and 67 percent among those who were subject to discrimination on the job (column

[11]We divide education attainment into three levels according to information on the number of years of continuous full-time education from the SHARE survey in 2006, complemented by age when individuals left continuous full-time education from SHARELIFE survey in 2008. The three levels are: up to 9 years, 10-13 years, and more than 13 years, corresponding to primary, vocational/secondary, and tertiary levels across several changes of the education system during the time SHARE respondents attended school. Czechoslovakia had similar levels of educational attainment to the OECD countries at that time.

[12]Unfortunately, there is no information on parental education.

4) and who lost a job due to persecution (column 5), respectively. The education level of those who were dispossessed (column 3) and who lost a job for a reason other than persecution (columns 6-7) does not differ significantly from the non-treated sample. The fact that losing a job for a reason other than persecution is unrelated to education shows the distinct nature of the communist labor market, where education was not valued in the same way as it is in free market economies.

The data also show a higher prevalence of the persecution-related treatments among older respondents (average year of birth in 1939-1941), while losing a job for a reason other than persecution was more likely to affect the younger cohorts with a lower socio-economic background. As dispossession affected wealthy families, respondents in this subsample were more likely to be born in households that owned the place of their residence, in a big city, and with the main breadwinner in a white-collar occupation.

These relationships square well with the historical development of Czechoslovakia during the second half of the 20th century. The highly educated individuals were the focus of oppression in Czechoslovakia and this group was most active in the opposition movement (Cerny (1992)). This was despite the fact that these individuals had much more to lose in the realities of the regime. While earnings differentiation by education level was relatively low, penalties which the state could inflict on those opposing the regime often took the form of significant professional degradation (see Section 4.3). Taking a non-conformist approach to the regime involved understanding of the regime's nature, courage and determination, features that are perhaps correlated with education but are not easily measured and controlled for. From the point of view of identifying the causal relationship between various forms of treatment and economic outcomes, this background calls for careful treatment of unobserved heterogeneity.

3.4 Jobs and Earnings

Analysis of consequences of persecution on earnings is conducted at the level of individual jobs. In the SHARELIFE data we have 2,920 employee jobs which started between 1953 and 1990.[13] We keep only those individuals who provided valid information on earnings and all other variables we use in the analysis. The first two columns in Table 3 describes the resulting sample of 2,319 individual jobs. Because we only have information on the level of *starting* earnings, we can analyze treatment effects that occurred in *subsequent* jobs. Our analysis thus focuses on earnings in the second

[13]We use financial values from 1953 onwards. This is because official records on average incomes from different sources, which are used for indexation of reported information in the data, are not available before 1953 (source of the average incomes data is the Czechoslovak Statistical Office).

and subsequent jobs these individuals had in their professional careers (1,220 jobs in the last two columns of Table 3).

INSERT TABLE 3 AROUND HERE

The top panel shows details on job characteristics, including the year in which they started and finished, whether they were full or part time positions, the employment sector and whether they were blue or white-collar jobs. Among those considered for the analysis, i.e. the second and subsequent jobs, 1.8 percent followed a job in which respondents experienced persecution-related discrimination, 1.6 percent followed a job separation due to persecution, while 2.4 percent followed a layoff, and 6.9 percent displacement. The distribution of jobs across sectors and occupations correspond to the historical structure of the economy and its gradual modernization (see Appendix A for details).

The bottom panel of Table 3 presents descriptive sample statistics on (log) net earnings relative to the average net wages from the Czech Statistical Office in the year for which the earnings are reported, i.e. when the individual was starting that specific job. Because our job sample covers over forty years of data on initial earnings, this relative approach represents a form of indexation of earnings with respect to the average growth in nominal wages. The overall mean relative net earnings in the total sample of jobs is equal to 1.108, while in the sample including only second and subsequent jobs it stands at 1.261. Since we follow specific cohorts in time, record only starting earnings and compare them to official average wages in a particular year, these ratios seem reasonable.[14] As one could expect the ratio is higher for second and subsequent jobs and its distribution has a clear log-normal pattern (see Appendix A for densities).

Earnings by age, education, sector and occupation presented in Table 3 reflect the evidence on the structure of wages in communist regimes.[15] The education premia are relatively low (14 and 29 percent for secondary and tertiary attainment, respectively) and we find a large gender penalty for women at about 50 percent despite the

[14]The Czech Statistical Office does not provide any other data on individual incomes before 1989.

[15]Labor income was regulated by a system of wage rate scales for different occupations and industries (Adam (1984)). Differences between these scales reflect the importance of different industries (armament, heavy industry and mining) as well as the ideological importance of the working class. Our data match the wage ratio of non-manual to manual occupations at 1.11 found by Boeri and Keese (1992). These low returns to education partially reflected the low demand for high skills in an economy characterized by lack of incentives for innovation and the low total factor productivity growth.

proclaimed earnings equality and high participation of women in the labor market.[16]

Finally, the mean relative earnings of those respondents who reported persecution are substantially lower than the mean with the exception of jobs following on-the-job discrimination. In particular, mean earnings in jobs following a job loss due to persecution are about 26 percent below the average. For the general experience of persecution and dispossession, the means are between 10 to 16 percent lower compared to the overall average, while there are no substantial differences for earnings in jobs after a layoff or displacement.

Figure 2 illustrates graphically the descriptive statistics in Table 3. It presents average relative initial earnings on first, second, third and fourth jobs for different subgroups of respondents in an average year when these jobs started. The green line represents average relative initial earnings for respondents who never experienced a job loss due to persecution. The blue and the red lines show earnings for those who did. The blue line reflects average initial earnings of these respondents prior to this experience, and the red line after they experienced a job loss due to persecution.

INSERT FIGURE 2 AROUND HERE

As we can see those who would eventually lose a job due to persecution started their working careers with relative earnings higher than those who never experienced such a job loss. Prior to being persecuted, the slope of earnings among the persecuted subsample was parallel if not steeper than that of those who were never persecuted. However, after a job loss due to persecution, their relative earnings fall dramatically (the red line) and on average grow at a much lower rate. The causal relationships behind these descriptive findings will be analyzed in the following sections.[17]

3.5 Pensions

The second type of economic outcomes we analyze with the aim to examine the long term consequences of persecution are retirement pensions. For this purpose, we first study the consequences of persecution on the initial pensions assigned according to the rules of the communist regime.[18] Second, we look at the value of pensions received at

[16]The official policy of equal treatment of men and women led to the latter's high educational attainment and labor market participation (around 80 percent, see Brainerd (2000)).

[17]The graph also confirms the findings in Table 2 that persecuted individuals, being born earlier on average, started their working careers earlier, and that their high relative earnings on the first job are primarily determined by higher education and gender. Finally, the graph also shows that individuals tended to stay very long on their jobs (namely the first job), with the average number of jobs per respondent being 1.9. There are very few observations for fifth and following jobs.

[18]For details on pension benefit calculation see Section 6 and Appendix E for details of the relevant legislation.

the time of the SHARE survey in 2006 in order to analyze whether the compensation policies after the fall of the regime helped to nullify the negative implications of persecution. The sub-sample for the pensions analysis presented in Table 4 consists of 614 observations on individuals for whom we have information on both initial and current pension benefits and other variables used in the analysis.[19] The average retirement age is 57.8 years with the average working career lasting about 39 years. Only 4.5 percent of retired respondents have no children and less than 8 percent were born outside of the current borders of the Czech Republic.

INSERT TABLE 4 AROUND HERE

The bottom panel of Table 4 shows descriptive statistics on the values of pensions. Similarly to the approach taken to earnings, we index the values of initial pensions by computing relative initial pension values as ratios of declared amounts to the official mean pension in the year the initial pension was received. The corresponding approach to current pensions is the ratio of the declared pension in the 2006 interview to the mean pension in 2006. The average ratio of initial pensions to the official mean is 1.106 and the ratio for 2006 pensions is 0.959. These values seem reasonable since the ratio of initial to the average pension is likely to be above one and would be expected to fall over time with the inflow of new cohorts of pensioners. Two points to note are that, first, like in the case of earnings, both initial and 2006 pensions are lower among females than males (11 and 16 percent for initial and current pensions, respectively), and second, there is little differentiation of average pensions by education, in particular for initial pensions. Table 4 shows important differences in the variation of average pensions among groups subject to a treatment. In particular, the initial pension of those respondents who ever lost a job due to persecution is 26 percent below average. The current 2006 pensions of treated retirees are much closer to the average pension benefits and there is little variation in the average level by treatment.

4 Results

The main set of results is divided into four separate categories. First, in Section 4.1 we examine the determinants of different forms of treatment. In Section 4.2 we analyze the effects of treatment on earnings and in Section 4.3 examine the most likely mechanism behind our findings. Finally, we focus on the long-term consequences of treatments for the level of pensions in Section 4.4.

[19] These represent 83.3 percent of initial and 71.3 percent of current pensions in the sample.

4.1 Determinants of Persecution

In order to understand the main determinants of being subjected to a treatment, we estimate the probability of each treatment conditional on individual characteristics. These probability models are also used in robustness checks in the analysis of the extent to which unobserved heterogeneity may bias the estimated treatment effects (see Appendix B).

The estimated models of the probability of being treated are of the following form:

$$P(T_i = 1) = \Phi(X_i\beta), \tag{1}$$

where $T_i = 1$ if a respondent i was ever subject to a treatment and $T_i = 0$ otherwise, and X_i are individual level characteristics.

Table 5 shows estimation results for six forms of treatment: being ever persecuted, dispossessed, discriminated at work because of persecution, losing a job due to persecution, and finally being ever laid-off or displaced for a reason other than persecution. The analysis is conducted at the level of individuals on the overall sample presented in Table 2. The independent variables control for potential background determinants of the analyzed outcomes, including several indicators for living conditions and family situation at age 10, birth-place information, education controls, year of birth and gender. These right-hand side variables can be thought of as exogenous with respect to the treatment variables as they correspond to either fixed characteristics or the nature of lives of the respondents before they entered the labor market. We thus refer to the right hand side variables as "determinants" of persecution.

INSERT TABLE 5 AROUND HERE

In the case of all four types of persecution there is a clear effect of time, with older individuals being more likely to experience persecution. The opposite is true for the case of losing a job for a reason other than persecution. Men and those born outside of the current borders of the Czech Republic were more likely to suffer persecution. The results confirm the education pattern observed in the descriptive statistics. Importantly, while higher education is strongly and significantly correlated with each of the four types of persecution, there is no effect of education on the probability of losing a job for a reason other than persecution.

In addition to education, the socio-economic status is also reflected by the number of books at home at the age of 10. Having no or few books at home during childhood increases the probability of being laid-off for a reason other than persecution, but

it reduces the probability of being persecuted. As one would expect, dispossession is strongly related to household's ownership at birth and the size of the accommodation at the age of 10. These measures reflect the obvious fact that in order to be dispossessed in the process of nationalization and collectivization the family of our respondents needed to own real estate property and land in the first place. The negative effect of the white-collar occupation of the head of household at the time when respondents were 10 years old is another likely reflection of farm collectivization and confiscation of land.[20]

A note of caution is perhaps necessary with regard to the effect of education on persecution, as it is the only variable where potential endogeneity might affect the value of the estimated coefficients. The reason behind this is that denied access to education was one of the main forms of persecution throughout the analyzed period. Many individuals could not go to university or even high school because of their family history, activities of their parents or background of relatives. Unfortunately, we do not have any information in the data whether and when the respondents faced any education restrictions. Although this effect might be partly picked up by childhood background variables, it is worth remembering that our estimates of the effect of education on persecution are most likely to be downward biased because of the negative correlation of unobservables related to persecution with the achieved level of education.

4.2 Earnings

The examination of the effect of the analyzed treatments on earnings takes into account the dynamic nature of treatment. The individual labor market histories in the SHARELIFE interview allow us to identify earnings after the following four labor market experiences: losing a job as a result of persecution (*"Job after persecution loss"*), being discriminated on a job (*"Job after discrimination"*), and two types of job loss for a reason other than persecution (*"Job after laid-off"* and *"Job after displaced"*). Since we are also able to specify when respondents experienced dispossession, we can additionally control for this experience in the regressions (*"Job after dispossession"*). The model is:

$$ln(rEarn_{it}) = T_{it}\alpha + X_i\gamma + J_{it}\delta + \epsilon_{it}, \tag{2}$$

[20]The SHARELIFE interview also collected information on the main reason for persecution: 65 percent of persecuted respondents were persecuted for political reasons, 27 percent for family background, and 14 percent for religious reasons. In all results we found no statistically significant differences between individuals persecuted for different reasons.

where $rEarn_{it}$ are relative earnings at time t and J_{it} are job specific characteristics. The treatment dummy, T_{it} takes value 0 if a respondent was never subject to the treatment *or* was subjected to it at time $s > t$. $T_{it} = 1$ if a respondent was subject to the treatment at time $s < t$.[21] ϵ_{it} is a job specific error term. In all estimations we cluster standard errors at individual level as ϵ_{it} is likely to be correlated within i.

The analysis of starting earnings in second and subsequent jobs is conducted using pooled OLS regressions run on a sample of 1,220 jobs with log relative starting earnings as the dependent variable. Table 6 displays the results of three treatment specifications with and without childhood controls. The first two specifications (column 1 and 2) estimate equation (2) controlling for all of the four types of labor-market treatment. In the next two (column 3 and 4) we extend the controls to include the potential effect of prior dispossession. Finally, the last two specifications (column 5 and 6) examine the consequences of being ever persecuted, which is a fixed effect across all jobs since we cannot determine whether persecution took place before or after a specific job. In all regressions we control for the following characteristics: gender, education, the full-time nature of the job, occupation and industry, residence in a big city when starting a job, experience prior to the job, job tenure of more than 5 years on the previous job, being out of the labor market for more than 3 years, the year of starting the job, being born in the country, being married and having children before the start of the job.

INSERT TABLE 6 AROUND HERE

Our key finding is the large and robust effect of persecution-related job loss on subsequent earnings. Job loss due to persecution carries an earnings penalty of about 32-34 percent across all alternative OLS specifications. It also stands in sharp contrast to losing a job for a reason other than persecution and experiencing other, less severe forms of on-the-job discrimination. The latter would most likely translate to lower earnings and worse work conditions already on the job where these forms of discrimination occurred. Since the SHARELIFE survey only collected information on starting earnings, the effect of this form of discrimination cannot be identified. Earnings in jobs that followed such discrimination seem to be unaffected. The fact that losing a job for a reason other than persecution has no significant effect on subsequent earnings reflects the regime's full employment strategy, low earnings inequality as well as the weak relationship between wages and productivity. These results suggest that earnings losses of the identified magnitude in the case of persecution-related job loss must have

[21] Since for each individual the time subscript also identifies a specific job, we omit the job-specific subscripts in the notation.

required determined actions by the regime with the specific aim to punish dissenting individuals in the labor market.

When we additionally control for being among the 13.4 percent respondents who were dispossessed by the communist regime, we find a lasting earnings scar of around 9-10 percent, on top of any specific job-related persecution. In this case persecution can be safely treated as exogenous with respect to earnings, since individuals could not have chosen the families they were born to and the dispossession dummy only takes value 1 if the loss of property happened prior to the receipt of analyzed earnings.

The earnings regressions further show premia of around 6 percent for secondary and 10 percent for tertiary education, respectively, both of which are statistically insignificant once we control for occupation and industry. There are also large effects of gender with the female earnings penalty of around 30 percent and a full time job premium of about 40 percent over the relatively rare part-time employment.

As we mentioned earlier, our results may be biased due to potential endogeneity of persecution. In our context endogeneity may be a result of self-selection into opposition during communism and to the justification bias in the survey. In the next section, we use instrumental variables analysis to account for the potential endogeneity of our treatment of key interest, namely job-loss due to persecution. In addition, the robustness of our estimates is examined in Appendix B along the lines proposed by Altonji et al. (2005). In terms of the potential role of unobserved heterogeneity in the case of persecution-related job loss we find that unobservable factors would have to be 1.39 times stronger than observables to explain away the full relationship between the treatment and the subsequent drop in earnings. Such a strong role of unobserved heterogeneity seems very unlikely. In the case of dispossession this ratio is lower at 0.86, but given the number of controls such a shift seems also unlikely. We also test for omitted variables (Oster (2013)) and provide estimates of the effect of treatment using matching estimators (Heckman et al. (1998), Abadie and Imbens (2006), Blundell and Costa Dias (2009), or Imbens and Wooldridge (2009)). All these tests confirm our baseline results.

Finally, to be sure that we are not merely capturing some unobserved fixed effect of persecuted individuals over their whole life, we run placebo regressions of first-job earnings on the same set of dependent variables. Table A.5 in Appendix A shows that there is no treatment effect on earnings in the first job. The only statistically significant variables in these regressions are age, gender, full-time job and tertiary education. The estimated effects of education are negative but this is more than

compensated by positive age effects, since people with higher education started their first jobs later. Initial earnings in the first job are also uncorrelated with all types of future job separations (see Gibbons and Katz (1991) for a comparison of laid-off and displaced workers). These placebo regressions confirm that persecution on the labor market expressed itself in the form of reduced earnings only through differential treatment of individuals during their subsequent professional career.

4.3 The Mechanism Behind Earnings Losses

The most common explanations of earnings losses following a job separation in market economies refer to the loss of job- or sector-specific human capital, worse quality of the employment match, loss of seniority and of industrial or union wage premiums. The literature based on US data finds consistent, sizeable and persistent negative consequences of displacement (Ruhm (1991), Jacobson et al. (1993), Fallick (1996), Wachter et al. (2007), Couch and Placzek (2010)), with scars of up to 30 percent immediately after a job separation and of around 10-15 percent for long-run effects (Farber (2011)). These losses increase in job tenure, age, employment gaps and the number of jobs following displacement. Gibbons and Katz (1991) find that among white-collar workers, reemployment earnings are more than 6 percent lower for those displaced by layoffs than for those displaced by plant closings. On the other hand, the evidence for Europe suggests small scarring effects for both laid-off and displaced workers, in particular if they reappear in employment after a short period of time.[22]

Wages under communism were not directly related to workers' productivity and there was generally little wage variation. Additionally, laid-off or displaced workers would normally be immediately re-employed given the obligation to work. These are the most likely reasons for the negligible effects of being laid-off or displaced on subsequent earnings in Table 6.

It is therefore particularly interesting that the effect of persecution-related job loss is so strong and so consistent under different specifications. The fall in earnings cannot be related to time out of the labor market since all displaced workers had three days to report their availability for a new job.[23] Therefore, the fall in earnings must have been related to some form of punitive action taken against those who lost their jobs as a result of persecution. Since the government had full control over people's

[22]See for example Hijzen et al. (2010) for the U.K., Huttunen et al. (2011) for Norway, Burda and Mertens (2001) for Germany, or Leonard and Van Audenrode (1995) for Belgium, and Lehmann et al. (2005) or Lehmann et al. (2006) for transition countries.

[23]See Appendix E for the legislation on "Duty to Work and Parasitism" and "Wage Determination and Job Assignment".

working careers it could punish those who opposed or dissented the regime by ordering terminations of jobs with subsequent assignments to low quality and low pay jobs, often far below people's qualification and with harsh working conditions (Nesporova (1999)).

The SHARELIFE data allow us to analyze the extent of job transitions in a multinomial probit model of the probability of moving between blue- and white-collar jobs conditional on treatment as well as individual and job characteristics. Our data provide information on four transition outcomes (S_i): staying in a blue-collar job ("B-B"), staying in a white-collar job ("W-W"), and moving between the two types of jobs ("B-W" and "W-B"). The probability of observing an individual i making a transition h following a job at time t is

$$P(S_{it} = h) = \Phi(X^*_{it}\pi), \tag{3}$$

where Φ is the multivariate normal distribution and $X^*_{it}\pi = T_{it}\alpha + X_i\gamma + J_{it}\delta$. The time indicator, t, defines a treatment and job characteristics *before* the transition. The treatment dummy, T_{it}, equals 1 if the respondent was subject to the treatment at time $s \leq t$, i.e. including the job he or she is transiting from. There are 1,237 recorded job transitions between 1953 and 1990 for which we have all sample information including the occupational characteristics (note that transitions from first jobs are included). We condition job transitions on the same variables used in column (4) of the earnings regression in Table 6.

INSERT TABLE 7 AROUND HERE

Conditional probabilities are presented in Table 7. The first line shows that the overall sample predicted probability of a transition from a white- to a blue-collar job is 6.6 percent. As the data cover Czechoslovakia in its economic development and individuals are observed over their career paths, the predicted probability of a shift from a blue- to a white-collar job is higher at 12.6 percent. We find high probabilities of staying within the same occupational category, with 47.9 percent for the blue- and 32.9 percent for the white-collar jobs, respectively.

The rest of Table 7 displays these probabilities conditional on setting the specific treatment variables to one. The most important result is the high predicted probability of 23.9 percent of switching from a white- to a blue-collar job after losing a job due to persecution. Those who were discriminated on the job were more likely to move up to a white-collar occupation (with predicted probability of 25.2 percent). This might suggest that possible reasons for conflicts at work resulting in on-the-job discrimination include the poor quality of these job matches. Separation from such a job could have

led to a position better fitted for people's skills and ambitions. Those who were laid-off for non-political reasons were most often persistent blue-collar workers (staying with 62.9 percent probability). While staying in a blue-collar occupation also has a high predicted probability among displaced workers, they also show a more pronounced transition from a white- to a blue-collar job.

The fact that persecution-related job losses often resulted in transitions from white- to blue-collar jobs is confirmed by historical sources and case studies documenting the lives of individuals punished by the regime for political reasons who were demoted to blue-collar jobs below their qualification.[24] The substantial earnings scars following persecution-related job losses in Table 6 are, therefore, most likely due to changes in industry or occupation. It is notable that our results are close to the approximately 30-percent wage reductions found for industry displacement in market economies by Neal (1995), Jacobson et al. (1993), or Poletaev and Robinson (2008).

4.4 Pensions

In order to assess whether the implications of treatments translated into long-term effects, we analyze two distinct values of initial and current (2006) pensions. The estimation of pensions is slightly different to that used for earnings because there is only one observation per individual:

$$ln(rPens_i) = \alpha T_i + \gamma' X_i + \lambda' W_i + \nu_i, \tag{4}$$

where $rPens_i$ is the relative pension (either initial or current) of person i. Treatment dummy takes value 1 or 0 conditional on whether the respondent was ever subject to a treatment or not, respectively. Besides individual characteristics X_i we also control for working career characteristics, W_i, such as total labor market experience, year of retirement as well as industry and occupation. Table 8 shows these effects first, on the level of initial pensions (columns 1-3), and second, for the same sample of respondents, on current pensions as recorded at the time of the 2006 SHARE survey (columns 4-6).

INSERT TABLE 8 AROUND HERE

For the initially assigned pensions, we observe a large, statistically significant effect of experiencing job loss due to persecution. The magnitude of this effect is as high as 40 percent. Since we control for total labor market experience this is a pure consequence

[24]Many case studies have been recorded at the Memory of the Nation website (www.pametnaroda.cz) and have been reflected in Czech culture including Kundera (1992) novel *The Joke*.

of the accumulated contribution of wages and of the rules governing the calculation of initial pensions, in particular allocation to lower pension categories (see Appendix E for details of legal rules determining pension categories and initial pensions calculation). On the other hand, we find no effect of dispossession or of being ever persecuted on initial pensions. Interestingly, both non-political reasons for losing a job also result in negative initial pensions effects, although their magnitude is smaller: for initial pensions the penalties are around 17 and 8.5 percent for individuals who experienced being laid-off and displaced, respectively.

Estimation results for the current 2006 pensions are very different. We no longer identify any statistically significant effects of being laid-off or losing a job due to persecution. This seems to suggest that various compensation policies adopted by the Czech government after 1990 have been very effective in redressing the long-term scars related to job losses due to persecution and subsequent career degradation. The Acts On Judicial and Extrajudicial Rehabilitation (119/1990 and 87/1991) provided financial compensation for each month of detention, imprisonment, health damages, property losses as well as for the alleviation of grievances. Individuals who had lost their jobs for reasons listed in these Acts became entitled to returning to their former employment positions, and if retired, to pension benefits recalculated for wages and categories of pensions corresponding to their lost employment. Using the counterfactual approach to reparations (Posner and Vermeule (2003)), contributed earnings to the pension system were recalculated as if the individual continued to be employed at the same job and occupation before the job loss, detention or imprisonment. All discriminatory retirement categories and personal pensions for active supporters of the regime were abolished in 1992. In 2004 and 2005, Government Decrees on Pension Supplement to Partially Compensate Social Injustices Caused by the Communist Regime substantially increased the pension supplements to persecuted individuals and their survivors.[25]

Appendix B shows detailed results of robustness checks with respect to the role of

[25]For our analysis, a pension was first assigned to a retiree according to the official administrative records on employment history and earnings. Only after the pension was assigned, the pensioner could claim the compensation supplements. The processing of a claim to a supplemental pension took several months in which the pensioner had to carry the burden of proof to be verified by the pension system administration. If approved, pensions supplements were paid retroactively since the later year either of retirement or 1990. Therefore, all initial pensions in our data were assigned according to the rules set by the communist regime, while data on current pensions recorded in 2006 automatically contain the compensation payments included in the regular monthly pension benefits. In addition, there were lump-sum compensation schemes by a German trust fund for forced laborers during World War II and the compensation of holocaust victims and their survivors. Appendix E provides a detailed overview of all important legislation and the description of the pension system.

unobserved heterogeneity. To explain away the identified effect of treatment on initial pensions, the unobservable factors would have to be 1.6 and 1.4 times stronger than observables, respectively, in the case of persecution-related job loss and being laid-off. Just as in the case of the earnings regressions such a strong role of unobservable factors is very unlikely. The magnitude of the estimated effects in OLS regressions is also supported by instrumental variable estimation in the next section.

5 Instrumental Variables Estimation

The previous sections document the large and lasting effect of losing a job due to persecution on earnings and initial pensions assigned during the Communist regime. These results, however, would only hold under the strong assumption of exogeneity of our measure of persecution with respect to our outcome variables and there are several reasons why this assumption may not be valid. First of all, in particular in the 1970s and 1980s, the risk of being persecuted was strongly related to individual choices of voicing opposition to the regime. If these choices related to unobservable characteristics which also determined wages, then the OLS estimates of the effect of persecution on earnings or pensions would be upward biased given the likely positive correlation between these unobservables and wages. On the other hand, respondents might tend to report being subjected to persecution to justify their—real or perceived—labor market failures. If this were the case the OLS estimates would be biased downward, given the resulting negative correlation between wages and declaration of persecution in the interview.

To correct for these potential sources of endogeneity we use two unique sources of administrative data available from judicial cases carried out after the fall of the communist regime. The first set of data derives from court cases related to rehabilitation of the victims of the regime. The second set comes from prosecution cases of the regime's officials. These two independent sources give us information on the intensity of persecution under communism in different years, which can be matched with the timing of experiences of persecution reported in the Czech sample of SHARELIFE. To identify the causal effect of persecution on wages and pensions we thus rely on the correlation of our instruments with persecution reported in the SHARE data and on the assumption that our instruments are independent of reported wages.

5.1 Rehabilitation

The first instrument derives from court decisions on rehabilitation of victims of the communist regime according to the *Act on Judicial Rehabilitation* 119/1990. The Act lists all legal provisions the regime used to persecute and incriminate people between 1948 and 1989 and abolishes such sentences *ex lege*.[26] Information on all cases from the rehabilitation processes have been summarized in a statistical publication by the Institute of Contemporary History of the Czech Academy of Sciences (Gebauer et al. (1993)), which provides the number of classified sentences together with the year in which sentences were decided on. Overall, 195,672 individuals were rehabilitated according to the Act. Of this total, 95,247 sentences originated from Communist law punishing individuals for emigrating from Czechoslovakia. The remaining 100,425 cases relate to the overall prevalence of persecution and these are matched to the data from SHARELIFE by year of the declared experience of losing a job due to persecution.

5.2 Prosecution

While the rehabilitation instrument represents the effort of the new democratic governments to do justice to the victims of Communist persecution, the second instrument is based on court decisions aimed at punishing those who were responsible for these crimes. Since 1991, the prosecution of these wrongdoers has been administered by the Bureau for Investigation and Documentation of the Crimes of Communism (BIDCC, established by Act 283/1991). The instrument once again consists of the number of violations of human rights and other abuses that occurred in a particular year between 1948 and 1989 which have been identified with the prosecuted party leaders, secret police agents, police officers, prison and border guards, and other officials of the former regime.

As has been the case in other post-Communist countries, the number of prosecuted individuals is incomparably lower than the number of victims. We need to remember that in order to be prosecuted, the perpetrator must have been identifiable and alive at the time of prosecution. Additionally the committed act had to be proven in court with sufficient evidence. As a result there have only been 189 cases of such prosecutions. Abuse of authority by the regime's secret service represents 119 of these cases, while the rest covers a vast range of crimes including 13 cases of murder and 33 cases of assault and battery. In 89 cases the wrongdoers were agents of the secret service.[27]

[26]For details including financial compensation see Appendix E and Kritz (1995).

[27]Besides the prosecuted perpetrators of criminal acts, many others, including collaborators of the secret service, were disqualified from public sector employment and political activity by the Lustration

INSERT FIGURE 3 AROUND HERE

The variation in intensity of persecution in the former Czechoslovakia as reflected in our two instruments is shown in Figure 3 with the red line representing the number of rehabilitation cases and the blue line the number of prosecution cases. The number of rehabilitated political cases originating from the Stalinist period (1949-1955) is enormous with between eight and twelve thousand individuals sentenced per year. After 1960 the number of cases falls below 1,000 per year and declines further to very low levels during the Prague Spring in the late 1960s. After the Soviet occupation in 1968 the numbers rise sharply and then stabilizes at between 200-400 cases per year. The last wave of repression appears around 1977 and 1978 when the regime persecuted the newly emerged dissident groups.

The three peaks in the intensity of persecution around the year 1950, 1968 and late 1970s can also be detected in the information on prosecuted individuals (the blue line in Figure 3). Naturally, the prosecution instrument puts more weight on more recent cases given the practical difficulties of prosecuting cases from the more distant past.

5.3 Relevance of Instruments

Both of our instruments reflect the regime's degree of oppression in any given year and the peaks of rehabilitation and prosecution cases correspond to the geopolitical situation and historical evidence on severity of persecution by the Communist regime (see Kaplan (1994)). In addition to these two instruments we take advantage of residential variation which resulted from job losses and instrument persecution with being resident in a big city *at the time of ending a job*. Residence status could give us additional identification as most of dissident activities occurred in Prague and other regional capitals, and forced residential displacement from cities to the countryside was an additional punishment(see Kaplan (1994) and Radosta (1993)). As we shall see below, we find that while our instruments are valid, their correlation with the endogenous variable is weak even in cases of overidentified estimations, with F-statistics in the range of about 3 to 4. Such weak nature of the instruments is perhaps not surprising given the complex phenomenon we model, and IV estimations with similar values of F-statistics have been used earlier in the literature (e.g. Levitt (1997)). However, to partly account for the weak instrument problem we follow Angrist, Imbens, and Krueger (1999) and apply the jackknife IV estimation method.

Act 451/1991.

5.4 Instrumental Variables Estimation Results: Earnings

The potential endogeneity of a job loss due to persecution, T_{it}, in equation (2) is instrumented by the following equation:

$$T_{it} = Z_{it}\pi + \eta_{it}, \tag{5}$$

where Z_{it} is the vector of instrumental variables. In our preferred specification we combine each of the two indicators of intensity of persecution with information on residence in a big city at the time of job loss, but for robustness we perform separate estimations using each of the two variables separately as well as using both of the indicators together.

Table 9 shows the instrumental variables estimation of the effect of a job loss due to persecution on initial relative earnings on the following jobs. The additional controls are the same as in Table 6, column (4), with childhood and dispossession controls included.[28]

INSERT TABLE 9 AROUND HERE

Hansen J statistics in the overidentified specifications in Table 9 (i.e. columns 2, 4-6) suggest that we cannot reject the validity of our instruments. On the other hand, as noted earlier, the first-stage F-statistics in the range of 2.7 - 3.5 indicate that our instruments are weak (see Kleibergen and Paap (2006) and Staiger and Stock (1997)). All results presented in Tables 9-11 are thus based on the jackknife instrumental variables estimation proposed by Angrist, Imbens, and Krueger (1999).[29]

Our results presented in Table 9 seem to be in line with what we find for the OLS in Table 6. When persecution-related job loss is instrumented by our indicators for intensity of persecution in a given year (individually in columns (1) and (3) or jointly in column (5)) the results are nearly identical to the OLS specification, with the negative effects of persecution-related job loss on subsequent earnings of between 33%-35%. When we use the residence in a big city at the time of losing the job as an additional instrument (columns (2), (4), and (6)), the point estimates are substantially higher at between 53%-58%.The more negative effect of persecution found in the latter IV specifications could point towards self-selection into opposition of individuals with

[28]The results without controlling for prior dispossession are very similar to the results in Tables 9-11 and are available upon request.

[29]See Appendix C for further description. For each model, the Kleibergen-Paap rank LM statistics rejects the null hypothesis that each of our models is underidentified at p-value< 0.01, and the LM test of redundancy confirms all instruments at χ^2 p-value< 0.01.

higher labor market potential and a selection induced bias of the OLS estimates. However, since the differences are not statistically significant and the F-statistics for the combined instruments are still very low such an interpretation requires caution.

5.5 Instrumental Variables Estimation Results: Pensions

The implementation of our instruments is less straightforward with regard to the estimation of the consequences of persecution on pensions. The level of pensions paid for the first time (initial) or in 2006 (current) was a result of the entire job history and specific regulations at the time. Thus the experience of ever losing a job due to persecution, or the lack of such experience, cannot be directly linked to a specific year in the earnings history to be matched with the instruments. In the IV estimations we therefore adopt two approaches to match the instruments. First, we identify the earliest (first) year when a job loss due to persecution occurred, and second, the last year in which such a job loss occurred. For people who never experienced a persecution-related job loss we take the year of ending the first or last job (prior to 1990), respectively. In this way we match the instruments reflecting the intensity of persecution as well as the information on residence in a big city at the time of the declared first and last job loss. Such matching of the instruments necessarily implies a measurement error in the precision of the timing of "treatment" and its instrument. Given the decline in the overall intensity of persecution it is reasonable to suspect that this measurement error will be lower in the case of matching with first jobs losses.

The results presented in Table 10 use the first job loss timing for the instruments and those in Table 11 the timing for the last job loss. In both cases we estimate the effect of losing a job due to persecution on initial and current pensions for the same IV specifications as in the case of earnings with the same additional control variables used in Table 8, columns (2) and (5).

INSERT TABLES 10 AND 11 AROUND HERE

Most of the results using the timing of the first job loss for matching of the instruments are greater but broadly in line with the estimates of the effect of persecution related job loss found in the OLS regressions given in Table 8. A job loss due to persecution reduces initial pensions by about 42-52%. When we use both rehabilitation and prosecution instruments together (columns 5-6) the point estimates of the effects are higher at around 70%. As in the case of estimates for earnings the standard errors are too high for the differences across specifications to be statistically significant. The

effects are lower, between 30-35%, for all six specifications when we use the timing of the last job loss for matching the instruments.

For both sets of IV estimations the differences with respect to the OLS specifications are relatively small and statistically insignificant. Importantly, the IV estimates confirm the results observed in the OLS estimates of the effects of persecution on pensions. Once again we find substantial and significant effects of the experience of persecution related job loss on initial pensions and no significant effects on pensions reported in the survey in 2006. The slightly higher values of the F-statistics in the case of matching our instruments using the timing of first job loss compared to the last job loss may reflect a better, more precise match of the instruments in the first case.

6 Transitional Justice and Compensation Policies

Transitional justice refers to "formal and informal procedures implemented by a group or institution of accepted legitimacy around the time of a transition out of an oppressive or violent social order, for rendering justice to perpetrators and their collaborators, as well as to their victims" (Elster (2006) in an excellent survey). While the last century provided many cases of transitional justice, from Western Europe and Japan after World War II, Southern Europe around 1975, Latin America in the 1980s, Eastern Europe after 1989, and Africa from 1979 to 1994, there has been no systematic comparative study of the long-term consequences on victims or wrongdoers themselves or on their children.

6.1 Theory of Transitional Justice

Compared to the research on remedial affirmative action programs and racial inequality, the existing work on transitional justice remains largely conceptual and theoretical.[30] There are two main theories: the Development Through Justice theory, where economic actors value the punitive and restorative transitional justice mechanisms that demonstrate government stability and respect for the rule of law, including measures for social integration of former victims (De Greiff (2006)). In this process, transitional justice has to compete for resources with other imminent and important tasks as economic reconstruction and transformation. The alternative Stability theory de-

[30]For the affirmative action studies, see Coate and Loury (1993), Carneiro et al. (2005), Heckman (1995), Heckman (1998), or Fryer (2010). For transitional justice, see Teitel (2006), Lavinia (2009), De Greiff (2006), or Elster (2006).

scribes transformation processes where actors are averse to trials and retributions: this approach is characterized by amnesties, truth commissions, or the forgive-and-forget principle (Spain and Latin American countries, see Kritz (1995)).

The transition process in the Czech Republic overall emphasized the Development Through Justice theory even at the cost of delaying privatization and other market reforms (Elster (2006)). The relative success of the economic transformation in the Czech Republic is an example conforming to findings of Olsen et al. (2011) that transitional democracies experiencing economic growth are more likely to utilize the relatively expensive Development Through Justice theory.

6.2 Reparations

Posner and Vermeule (2003) define reparations as large scale governmental transfers to individuals, groups or institutions, applying backward-looking justice through rectification of past wrongs committed under a previous legal regime. Reparations as legislative acts appeal to the moral norms held in society at large or as settlements of class action lawsuits.[31]

In order to redress past injustice, governments have used either ad-hoc schemes of lump-sum payments or a counterfactual method of compensations comparing what would have happened had the injustice not taken place (see Darity and Frank (2003)). Government-induced reparations often lead to annuity payments (pension supplements in the Czech Republic, Poland, Hungary, or Chile) and trust funds providing opportunities for self-development and advancement, access to health care or education. Class action lawsuits are usually settled in lump-sum cash compensations (Native American tribes in the U.S. or Canada).

The template for the modern international reparations has been the post-war German and European reparations for Jewish victims of Nazi persecution, unprecedented in their direct support to harmed individuals.[32] In the United States, the government apologized and disbursed more than $1.6 billion in reparations to 82,219 interned Japanese Americans and their heirs as well as settled claims with Indian tribes (1946),

[31]For the rights to these remedies, see The United Nations Basic Principles and Guidelines on the Rights to a Remedy and Reparation for Gross Violations of International Human Rights Law and Serious Violations of International Humanitarian Law, Article 8 of the Universal Declaration of Human Rights, or Article 10 of the American Convention on Human Rights.

[32]These compensation payments amounted to more than DM 100 billion up to the year 2000, payable to Holocaust survivors and their heirs, both individually and through the state of Israel, for loss of life or health, forced and slave labour, deportation, imprisonment, maltreatment and degradation, or property losses (including income, pensions, savings, or art). For a summary see http://www.yadvashem.org. These reparation schemes far outstrip anything that has been done for the more numerous victims of communism in the Soviet Union, China, and Eastern Europe.

with victims of radiation exposure (1990), and in the case of Tuskegee study (1997).[33]

For a long time, these reparations had been among the few compensation programs implemented.[34] However, since 2000, the situation has began to rapidly change. Many past illegal practices and human rights violations have been recognized and compensated. The U.S. government has negotiated a series of new settlements with Native Americans tribes.[35] After the Canadian Constitution had been amended to confirm Aboriginal rights, more than 350 class action suits have been settled by the government.[36]

There are two policies practiced in most countries during the 20th century that are currently open for wide-ranging settlements. The first is forced sterilization, recognized now as a crime against humanity within the jurisdiction of the International Criminal Court.[37] From 1907 through the 1970s, more than 60,000 U.S. citizens were forcibly sterilized (Stern (2005)). In many countries, victims of eugenistic legislation have been already compensated while in many countries including the United States the process has recently started.[38] The numbers are staggering: In Peru, the Minister of Health revealed that just between 1995 and 2000, around 330,000 women were sterilized (PRI (2002)). The official sterilization programs in India or China concern millions of individuals.

The second case is the policy of forced adoptions of children of single or young mothers. The Australian government is facing compensation claims to the Stolen Generations victims of forced removal of 25,000 Aboriginal and 250,000 non-Indigenous

[33]See the Civil Liberties Act of 1988, www.bia.gov of the Bureau of Indian Affairs at the U.S. Department of Interior. While the compensation of slavery in the United States is considered unfeasible on many grounds, discrimination based on the Jim Crow practices of restrictions on schooling, housing, medical services, or labor market discrimination, seems more plausible to redress (see Darity and Frank (2003)).

[34]Other major international compensation programs include the victims of military dictatorships in Latin America (Chile 1992, Argentina 1983), Korean comfort women by Japanese government in 1990s, and forced assimilation of Native Canadians in 1998.

[35]In addition to the $554 million settlement with the Navajo Nation in 2014, the current U.S. administration has negotiated similar deals amounting to $2.61 billion with 80 Native Americans tribes for exploitation of tribal trust resources. In 2010, the Department of Interior settled for $3.4 billion with a class action lawsuit representing 500,000 American Indians for mismanagement of Individual Indian Money accounts, and a $760 million settlement was reached with Native American farmers for discrimination in federal farm loan processing by U.S. Department of Agriculture. Further, in 2012, the United States announced settlements with 41 tribes for about $1 billion. See www.bia.gov of the Bureau of Indian Affairs at the U.S. Department of Interior.

[36]Out of more than 750 claims the biggest case was the Indian Residential Schools Settlement Agreement of 2007 for $C1.9 billion to 80,000 Native Canadians from the government-financed forced school system. See Department of Aboriginal Affairs and Northern Development (AAND) at www.aadnc-aandc.gc.ca.

[37]By the end of World War II, over 400,000 individuals were sterilised under the Nazi regime (see Bashford and Levine (2010)).

[38]The first U.S. state that will compensate these wrongs is North Carolina in 2014. In Alberta, Canada, first victims of the Sexual Sterilization Act were already awarded C$142 million in damages.

children from their young unmarried mothers (from the 1930s to 1982). Similarly, during the Baby Scoop Era that lasted from 1940s till early 1970s, it is estimated that up to 4 million mothers in the United States had newborns taken from them in the hospital for adoption purposes.[39]

In recent years, many countries have been on the brink of opening its historical black boxes. In Spain, the Historical Memory Law of 2007 finally recognized the victims of political, religious and ideological violence on both sides of the Spanish Civil War and of the Franco regime. For the first time ever, compensation schemes are now available to victims of colonial powers. In 2012 Kenyans were given the right to sue the British government for abuses by colonial officials.[40] The Baltic countries and Poland are currently demanding compensations from Russia for around 1.5 million people deported to Soviet Gulags. Both sides in the Israeli-Palestinian conflict have agreed in principle on a compensation program to refugees but its implementation is stalled on the issue of the right of return.

On their paths to democracy, other countries will face similar class action lawsuits or demands for reparations. For example, at the 18th Communist Party Congress in 2013, Chinese officials announced a plan to abolish the Re-education Through Labour system of detention for individuals who are not criminals but had committed only minor offenses. Laogai (2008) estimates the number of these prisoners at 500,000-2 million individuals in more than 1,000 detention camps. These numbers exclude political prisoners actually sentenced and imprisoned as well as the population of the penal labor camps. If and when transitional justice starts in China, compensation claims of persecuted individuals and their descendants might include millions of people.[41]

7 Conclusions

The evidence presented in this paper certainly does not do justice to the victims of the Czechoslovak communist regime between 1948 and 1989. Not only jobs, but lives were lost, dissenting people were imprisoned or sent to labor camps, and many individual

[39] Approximately 80 percent of infants born to single mothers were taken for adoption in the late 1960s. Similar practices took place in many countries around the world, namely the United Kingdom, New Zealand, Ireland, Sweden, or Canada. For Australia, see www.nsdc.org.au and Cuthbert and Quartly (2013). For the U.S. see Stolley (1993), Brozinsky (1994), and related consequences in Donohue and Levitt (2001).

[40] The survivors of more than 70,000 Mau Mau interned without trial in concentration camps during the independence struggle in the 1950s sued the British government and, in 2013, Great Britain agreed to pay compensations. Similar abuses occurred during the national liberation struggles in Malaya, Aden, Cyprus and Northern Ireland. For Kenya, see http://www.khrc.or.ke.

[41] Courtois et al. (1999) estimate the total death toll of persecution in China since 1949 at around 60 million.

careers and family lives were broken by the power of the communist state. Those who suffered most under the totalitarian regime have long died and many of those who survived the worst periods of persecution belonged to cohorts which could not have been expected to live through to the 2000s.

Our results document the extent of labor market persecution using a general representative sample of individuals who have lived through to see the system collapse. To appreciate the scale of the consequences of the communist rule we believe it is crucial to understand what happened to ordinary citizens just as it is to document the few case studies of well-known dissidents. We are not aware of any other study which has addressed the issue of economic consequences of persecution in a quantitative manner using representative survey data. Persecution-related job loss implied a significant deterioration of professional career with substantially lower earnings and had long-term consequences which were reflected in drastically reduced pension benefits assigned during the communist regime. According to our OLS specifications, earnings in jobs following a persecution related job loss were reduced on average by about one third, while initial pensions assigned to those who suffered such a job loss were lower by about 40%. The IV analysis conducted using unique sources of information on the variation in intensity of persecution over time supports the OLS analysis. It seems that with regard to the experience of persecution in our case either endogeneity should not be much of a concern, or the two main sources of bias (self-selection to groups with a high risk of persecution and justification bias) cancel each other out.

A very important result of the analysis is that compensation policies implemented by the Czech government after 1989 seem to have successfully remedied the long-term scars of persecution in the labor market. The compensation policies applied to former Czechoslovakia represent a relatively easy case—recent and discrete instances of persecution with identifiable victims who could carry the burden of proof at a low cost in a small country with democratic traditions, immediately after the transition process started. Posner and Vermeule (2003) in their overview of transitional justice analyze in detail not only the legal and constitutional hurdles but also the formidable practical and valuation problems that often require counterfactual consideration of pain and suffering, lost employment and opportunities. The purpose of this paper is obviously not to advocate compensation policies across the world and history. However, the fact is that only a tiny fraction of victims of persecution has been compensated. The last century was a period of systematic human rights violation and authoritarian regimes with millions of direct persecution victims still alive. The Polity (2014) project esti-

mates that even since 1991, more than 40 percent the world population has been ruled by nondemocratic regimes. Only scarce attention has been given to consequences of persecution and to the issue of redress and reparation to the victims. Our results as well as those in Dell (2010) or Acemoglu et al. (2011) show that discriminatory policies may have sizeable long-term effects on current economic outcomes even after decades and centuries have passed.[42] Political economy theory devoted to the modeling of democratic institutions might therefore miss a significant part of the world's public sector activity.

[42]See Dell (2010) for the case of Peruvian forced mining mita labor system. Acemoglu et al. (2011) show that regions and cities that experienced extreme levels of violence and persecution are worse off even after 50 years. We analyze health and other effects of labor market discrimination in Bohacek and Myck (2011) with comparable results to Sullivan and Von Wachter (2009).

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Table 1: Persecution in Czechoslovakia 1948-1989

Population 1948	8,893,000
Arrests	205,000
Corrective Labor Camp	70,000
Penal Labor Camp	20,000
Military Penal Units	60,000
Clergy Detention Camps	10,300
Deaths	
Executed	248
Prison	4,500
Border	300
Total estimate*	15,000
Emigration	270,000
Job losses (1970s and 1980s)**	280,000

Notes: *Includes indirect deaths of individuals after their release from prison and labor camps, estimated at around 10,000. **Job losses before 1970 not documented. Population in 1948 only in the Czech lands. Sources: The Bureau for Investigation and Documentation of the Crimes of Communism The Institute for the Study of Totalitarian Regimes, Courtois et al. (1999), CSU (2010), Kaplan (1992), Kaplan and Palecek (2001), Naimark (1998).

Table 2: Sample Statistics

		Ever		Ever Job	Ever Job Loss		
	All	Persecuted	Dispossessed	Discr	Persecution	Laid-Off	Displaced
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Fraction	1.00	0.115	0.134	0.061	0.031	0.046	0.164
	—	(0.320)	(0.340)	(0.186)	(0.128)	(0.124)	(0.329)
Year of birth	1943.857	1941.522***	1942.807*	1940.569**	1939.762*	1947.952***	1946.070***
	(7.802)	(8.132)	(8.426)	(7.785)	(8.437)	(6.064)	(6.181)
Female	0.570	0.453**	0.541	0.293***	0.333*	0.542	0.662*
	(0.495)	(0.499)	(0.499)	(0.459)	(0.483)	(0.501)	(0.475)
Born in country	0.953	0.931	0.945	0.914	0.857	0.928	0.951
	(0.211)	(0.255)	(0.229)	(0.283)	(0.359)	(0.261)	(0.217)
Education <10 years	0.178	0.132	0.147	0.034***	0.048*	0.157	0.204
	(0.382)	(0.340)	(0.355)	(0.184)	(0.218)	(0.366)	(0.405)
Education 10-13 years	0.644	0.535**	0.651	0.483*	0.286**	0.687	0.592
	(0.479)	(0.500)	(0.478)	(0.504)	(0.463)	(0.467)	(0.493)
Education >13 years	0.179	0.333***	0.202	0.483***	0.667***	0.157	0.204
	(0.383)	(0.473)	(0.402)	(0.504)	(0.483)	(0.366)	(0.405)
Birthplace: owner	0.610	0.610	0.761***	0.534	0.667	0.675	0.542
	(0.488)	(0.489)	(0.427)	(0.503)	(0.483)	(0.471)	(0.500)
Birthplace: village	0.474	0.478	0.518	0.431	0.524	0.530	0.528
	(0.499)	(0.501)	(0.501)	(0.500)	(0.512)	(0.502)	(0.501)
Birthplace: small city	0.366	0.371	0.381	0.345	0.238	0.373	0.303
	(0.482)	(0.485)	(0.487)	(0.479)	(0.436)	(0.487)	(0.461)
Birthplace: big city	0.160	0.151	0.101**	0.224	0.238	0.096*	0.169
	(0.367)	(0.359)	(0.302)	(0.421)	(0.436)	(0.297)	(0.376)
Age 10: no books	0.470	0.386*	0.502	0.362	0.476	0.578*	0.381*
	(0.499)	(0.488)	(0.501)	(0.485)	(0.512)	(0.497)	(0.487)
Age 10: low room	0.566	0.516	0.500	0.534	0.476	0.386***	0.641
	(0.496)	(0.501)	(0.501)	(0.503)	(0.512)	(0.490)	(0.481)
Age 10: no facilities	0.171	0.215	0.208	0.276	0.143	0.157	0.179
	(0.377)	(0.412)	(0.407)	(0.451)	(0.359)	(0.366)	(0.384)
Age 10: parents	0.917	0.885	0.880	0.879	0.905	0.902	0.864
	(0.277)	(0.321)	(0.326)	(0.329)	(0.301)	(0.299)	(0.344)
Age 10: white collar	0.214	0.272	0.135***	0.309	0.286	0.273	0.245
	(0.410)	(0.446)	(0.342)	(0.466)	(0.463)	(0.448)	(0.431)

Source: Authors' calculations using SHARELIFE data. N=1,521. Robust standard errors in parentheses. In columns (2)-(7), mean and robust standard error of the treated group. *p <0.1, **p <0.05, and ***p <0.01 are the p-values from the two-group mean-comparison test between the treated and the corresponding non-treated group (i.e., in column (2) between those who were persecuted ever and those were never persecuted).

Table 3: Sample Statistics: Jobs and Earnings

Job characteristics	All jobs		All but first jobs	
	Mean	St.dev.	Mean	St.dev.
Year job start	1968.412	(10.205)	1973.012	(9.188)
Year job end	1983.127	(14.989)	1985.161	(12.446)
Full time job	0.969	(0.173)	0.952	(0.215)
Agriculture	0.062	(0.241)	0.049	(0.215)
Industry	0.461	(0.498)	0.431	(0.495)
Services	0.478	(0.500)	0.520	(0.500)
White collar	0.500	(0.500)	0.582	(0.493)
Blue collar	0.484	(0.500)	0.399	(0.490)
Relative net earnings				
All	1.108	(0.718)	1.261	(0.813)
Male	1.354	(0.841)	1.584	(0.946)
Female	0.926	(0.546)	1.035	(0.611)
Born in country	1.111	(0.732)	1.268	(0.832)
Education <9 years	1.035	(0.763)	1.082	(0.762)
Education 9-13 years	1.079	(0.702)	1.234	(0.810)
Education >13 years	1.205	(0.724)	1.409	(0.822)
Agriculture	0.960	(0.505)	1.044	(0.494)
Industry	1.146	(0.699)	1.310	(0.787)
Services	1.090	(0.754)	1.240	(0.853)
White collar	1.136	(0.720)	1.294	(0.790)
Blue collar	1.047	(0.681)	1.163	(0.794)
Job after persecution loss			0.930	(0.450)
Job after discrimination			1.334	(0.768)
Job after laid-off			1.243	(0.867)
Job after displaced			1.212	(0.842)
Job after dispossession	0.979	(0.551)	1.051	(0.571)
Persecuted ever	1.065	(0.639)	1.157	(0.683)

Source: Authors' calculations using SHARELIFE data. N=2,319 (all jobs), N=1,220 (all but first jobs). Weighted by individual sample weights.

Table 4: Sample Statistics: Pensions

Individual Characteristics	Mean	St.dev.
Year of birth	1936.992	(6.876)
Year of first employment	1955.492	(7.373)
Year of first pension	1994.888	(7.287)
Years of white-collar occupation	20.239	(17.639)
Years of blue-collar occupation	17.742	(18.298)
Female	0.666	(0.472)
Children ever	0.955	(0.208)
Born in country	0.923	(0.267)

Relative Pension

	Initial		Current	
	Mean	St.dev.	Mean	St.dev.
All	1.106	(0.498)	0.959	(0.156)
Male	1.184	(0.424)	1.056	(0.150)
Female	1.067	(0.527)	0.911	(0.135)
Born in country	1.125	(0.505)	0.961	(0.158)
Children ever	1.113	(0.502)	0.959	(0.157)
Education <9 years	1.086	(0.544)	0.897	(0.148)
Education 9-13 years	1.114	(0.551)	0.942	(0.142)
Education >13 years	1.103	(0.295)	1.043	(0.159)
Job loss persecution ever	0.819	(0.439)	1.032	(0.146)
Job discrimination ever	0.999	(0.295)	1.002	(0.173)
Job laid-off ever	0.877	(0.323)	0.958	(0.140)
Job displaced ever	0.939	(0.262)	0.943	(0.134)
Dispossessed ever	1.048	(0.392)	0.932	(0.153)
Persecuted ever	1.026	(0.317)	0.984	(0.184)

Source: Authors' calculations using SHARELIFE data. N=614. Weighted by individual sample weights. Current pension in 2006 SHARE interview.

Table 5: Probit Marginal Effects: Determinants of Persecution

	Ever		Ever Job	Ever Job Loss		
	Persecuted	Dispossessed	Discr.	Persecution	Laid-Off	Displaced
	(1)	(2)	(3)	(4)	(5)	(6)
Year of birth	-0.003***	-0.002	-0.002***	-0.001**	0.004***	0.004***
	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)
Female	-0.043***	-0.006	-0.033***	-0.006	-0.008	0.033**
	(0.015)	(0.018)	(0.010)	(0.006)	(0.011)	(0.015)
Born in country	-0.057*	-0.020	-0.032*	-0.019**	-0.021	0.001
	(0.031)	(0.039)	(0.018)	(0.009)	(0.023)	(0.036)
Children ever	-0.039	0.002	-0.024	0.001	0.001	-0.036
	(0.043)	(0.052)	(0.024)	(0.011)	(0.034)	(0.043)
Education 10-13 years	0.006	0.039	0.035*	0.008	0.003	-0.015
	(0.021)	(0.025)	(0.020)	(0.010)	(0.016)	(0.020)
Education >13 years	0.069***	0.075**	0.070***	0.036***	-0.009	0.012
	(0.026)	(0.032)	(0.022)	(0.012)	(0.021)	(0.025)
Birthplace: owner	0.010	0.094***	-0.003	0.005	0.006	-0.030*
	(0.016)	(0.020)	(0.010)	(0.006)	(0.012)	(0.016)
Birthplace: village	0.009	-0.025	0.003	0.010	0.008	0.047***
	(0.018)	(0.020)	(0.012)	(0.007)	(0.013)	(0.018)
Birthplace: big city	-0.026	-0.045	0.009	0.012	-0.016	0.014
	(0.023)	(0.028)	(0.013)	(0.009)	(0.018)	(0.022)
Age 10: low room	-0.014	-0.037**	-0.003	-0.004	-0.036***	0.031**
	(0.015)	(0.018)	(0.009)	(0.005)	(0.011)	(0.016)
Age 10: no books	-0.032*	-0.003	-0.013	0.007	0.026**	-0.029*
	(0.017)	(0.019)	(0.011)	(0.006)	(0.013)	(0.017)
Age 10: no facilities	0.025	0.010	0.028**	-0.007	0.007	0.006
	(0.020)	(0.024)	(0.013)	(0.008)	(0.015)	(0.021)
Age 10: parents	-0.020	-0.024	0.002	-0.005	0.001	-0.053**
	(0.026)	(0.030)	(0.017)	(0.008)	(0.019)	(0.024)
Age 10: white collar	0.023	-0.068***	0.007	-0.000	0.028*	0.002
	(0.019)	(0.025)	(0.011)	(0.007)	(0.015)	(0.019)
χ^2	60.059	43.563	62.113	61.539	46.924	42.492
Pseudo-R^2	0.057	0.043	0.135	0.181	0.079	0.048

Source: Probit marginal effects. Authors' calculations using SHARELIFE data. N=1,521. Robust standard errors in parentheses. *p <0.1, **p <0.05, ***p <0.01.

Table 6: OLS Regressions: Earnings

	(1)	(2)	(3)	(4)	(5)	(6)
Job after persecution loss	-0.341***	-0.338***	-0.319***	-0.316***		
	(0.079)	(0.086)	(0.077)	(0.084)		
Job after discrimination	-0.012	0.011	0.042	0.072		
	(0.143)	(0.146)	(0.149)	(0.153)		
Job after laid-off	0.237	0.227	0.236	0.226		
	(0.163)	(0.163)	(0.160)	(0.159)		
Job after displaced	0.024	0.026	0.025	0.026		
	(0.114)	(0.104)	(0.113)	(0.103)		
Job after dispossession			-0.087*	-0.098**		
			(0.049)	(0.046)		
Persecuted ever					-0.056	-0.040
					(0.042)	(0.044)
Full time job	0.404***	0.388***	0.405***	0.387***	0.378***	0.363***
	(0.107)	(0.103)	(0.108)	(0.104)	(0.105)	(0.102)
Experience	0.060***	0.058***	0.058***	0.057***	0.054***	0.054***
	(0.013)	(0.014)	(0.013)	(0.014)	(0.013)	(0.014)
Experience Sq.	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Job tenure 5+ years	0.014	0.005	0.013	0.003	0.018	0.008
	(0.040)	(0.041)	(0.040)	(0.040)	(0.041)	(0.041)
Out of LM 3 years	-0.138***	-0.145***	-0.136***	-0.144***	-0.136***	-0.143***
	(0.051)	(0.052)	(0.052)	(0.052)	(0.051)	(0.052)
Year job	-0.130***	-0.126***	-0.130***	-0.126***	-0.129***	-0.125***
	(0.032)	(0.032)	(0.032)	(0.032)	(0.032)	(0.032)
Year job Sq.	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Education 10-13 years	0.062	0.069	0.057	0.062	0.059	0.067
	(0.061)	(0.060)	(0.059)	(0.058)	(0.061)	(0.060)
Education >13 years	0.097	0.116	0.089	0.108	0.083	0.100
	(0.074)	(0.076)	(0.073)	(0.075)	(0.074)	(0.076)
Born in country	0.053	0.050	0.048	0.044	0.037	0.035
	(0.054)	(0.056)	(0.053)	(0.057)	(0.058)	(0.060)
Female	-0.328***	-0.320***	-0.325***	-0.317***	-0.322***	-0.315***
	(0.052)	(0.051)	(0.051)	(0.050)	(0.052)	(0.052)
Age	-0.076**	-0.075**	-0.077***	-0.075**	-0.068**	-0.068**
	(0.029)	(0.030)	(0.030)	(0.031)	(0.030)	(0.031)
Age Sq.	0.001***	0.001**	0.001***	0.001**	0.001**	0.001**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Married	0.007	0.005	0.006	0.004	0.005	0.004
	(0.049)	(0.050)	(0.049)	(0.050)	(0.049)	(0.050)
Children	-0.033	-0.026	-0.025	-0.018	-0.030	-0.026
Childhood controls	No	Yes	No	Yes	No	Yes
R^2	0.360	0.369	0.363	0.373	0.352	0.361

Source: Authors' calculations using SHARELIFE data. N=1,220. Clustered standard errors in parenthesis. $*p < 0.1$, $**p < 0.05$, $***p < 0.01$. Dependent variable: ratio of starting earnings to average earnings on a particular year (in logs). Additional controls: job industry, occupation, residence in a big city when starting a job . Childhood controls: head of household birthplace owner, birthplace village, birthplace big city; At respondent age 10 household: no books, low room to person ratio, no facilities, both parents, head of household white-collar occupation.

Table 7: Predicted Probabilities of Transitions Between White- and Blue-Collar Jobs

	White-White (1)	White-Blue (2)	Blue-White (3)	Blue-Blue (4)
Sample	0.329***	0.066***	0.126***	0.479***
	(0.027)	(0.009)	(0.010)	(0.028)
Job after persecution loss	0.214*	0.239**	0.108	0.439**
	(0.115)	(0.121)	(0.081)	(0.185)
Job after discrimination	0.294***	0.107	0.252***	0.347**
	(0.112)	(0.081)	(0.087)	(0.149)
Job after laid-off	0.209	0.162	0.000***	0.629***
	(0.155)	(0.100)	(0.000)	(0.189)
Job after displaced	0.231**	0.188***	0.032	0.550***
	(0.102)	(0.070)	(0.031)	(0.117)
Job after dispossession	0.344***	0.114***	0.139***	0.402***
	(0.060)	(0.025)	(0.031)	(0.061)
Persecuted ever	0.376***	0.088***	0.128***	0.407***
	(0.067)	(0.023)	(0.029)	(0.074)

Source: Predicted values from multinomial probit. Authors' calculations using SHARELIFE data. N=1,237. Note: Transitions from first jobs included. Clustered standard errors in parentheses. *p <0.1, **p <0.05, ***p <0.01. Independent variables as in column (4) in Table 6.

Table 8: OLS Regressions: Pensions

	Initial Pension			Current Pension in 2006		
	(1)	(2)	(3)	(4)	(5)	(6)
Job loss persecution ever	-0.402**	-0.405**		0.030	0.027	
	(0.187)	(0.186)		(0.066)	(0.066)	
Job discrimination ever	0.032	0.036		-0.021	-0.016	
	(0.049)	(0.051)		(0.036)	(0.037)	
Job laid-off ever	-0.169**	-0.170**		-0.005	-0.006	
	(0.086)	(0.086)		(0.033)	(0.033)	
Job displaced ever	-0.084*	-0.085*		-0.039*	-0.040*	
	(0.048)	(0.048)		(0.023)	(0.023)	
Dispossessed ever		-0.012			-0.011	
		(0.045)			(0.021)	
Persecuted ever			-0.030			-0.003
			(0.051)			(0.024)
Year of birth	1.002	0.993	1.531	0.487	0.478	0.425
	(1.372)	(1.371)	(1.401)	(0.842)	(0.839)	(0.815)
Year first pension	0.055	0.056	0.023	-0.078**	-0.078**	-0.073**
	(0.070)	(0.070)	(0.076)	(0.035)	(0.035)	(0.034)
Experience	0.019	0.019	0.009	0.020	0.020	0.020
	(0.039)	(0.039)	(0.041)	(0.019)	(0.019)	(0.019)
Female	-0.192***	-0.191***	-0.175***	-0.134***	-0.133***	-0.134***
	(0.051)	(0.052)	(0.052)	(0.024)	(0.024)	(0.024)
Children ever	0.103	0.103	0.162	0.011	0.011	0.016
	(0.084)	(0.084)	(0.121)	(0.038)	(0.038)	(0.037)
Education 10-13 years	-0.022	-0.022	-0.020	-0.034*	-0.034*	-0.034*
	(0.050)	(0.050)	(0.050)	(0.019)	(0.019)	(0.019)
Education >13 years	0.003	0.003	0.005	0.003	0.003	0.004
	(0.066)	(0.066)	(0.067)	(0.028)	(0.028)	(0.028)
Born in country	0.226***	0.226***	0.238***	0.013	0.012	0.012
	(0.075)	(0.076)	(0.081)	(0.027)	(0.027)	(0.027)
R^2	0.207	0.207	0.173	0.390	0.391	0.386

Source: Authors' calculations using SHARELIFE data. N=614. Robust standard errors in parentheses. *p <0.1, **p <0.05, ***p <0.01. Current pension in 2006 SHARE interview. Dependent variable: ratio of initial pension to average pension in a particular year (in logs, columns 1-3) and ratio of pension to average retirement pension in 2006 (in logs, columns 4-6). Additional controls: ever in job industry, ever in occupation. Childhood controls included. Squared effects of year of birth, year of first pension, and labor market experience negligible.

Table 9: IV Estimation: Effect of Job Loss Due to Persecution on Earnings

	Instrument					
	Prosecution		Rehabilitation		Prosecution and Rehabilitation	
	(1)	(2)	(3)	(4)	(5)	(6)
Earnings	-0.328***	-0.525**	-0.346***	-0.556***	-0.340***	-0.577**
	(0.110)	(0.224)	(0.096)	(0.207)	(0.114)	(0.224)
F-test	2.721	3.383	3.148	2.909	2.931	3.459
p-value	0.099	0.034	0.076	0.055	0.054	0.016
Hansen-J	—	0.426	—	0.638	0.940	0.990
p-value	—	0.514	—	0.425	0.332	0.610
Additional instrument						
Residence in Big City	No	Yes	No	Yes	No	Yes

Source: Authors' calculations using SHARELIFE data. Robust standard errors in parentheses. *p <0.1, **p <0.05, ***p <0.01. N=1,220. Dependent variable: ratio of starting earnings to average earnings on a particular year (in logs). Additional controls as in Table 6, childhood controls and dispossession included. Instruments: number of prosecution or rehabilitation cases in a year of starting a job, residence in a big city when the previous job ended. F-test is the Kleibergen and Paap (2006) rank Wald F statistics of the excluded instruments in the first-stage regression. Hansen-J statistics for the null hypothesis $J = 0$ that the overidentification restrictions are valid.

Table 10: IV Estimation: Effect of Ever Losing a Job Due to Persecution on Pensions

	Instrument Based on First Job					
	Prosecution		Rehabilitation		Prosecution and Rehabilitation	
Pension	(1)	(2)	(3)	(4)	(5)	(6)
Initial	-0.437**	-0.523**	-0.472**	-0.415*	-0.696**	-0.701**
	(0.185)	(0.249)	(0.194)	(0.220)	(0.238)	(0.272)
Current	-0.029	-0.114	-0.029	-0.057	-0.093	-0.150*
	(0.067)	(0.082)	(0.070)	(0.077)	(0.077)	(0.091)
F-test	1.765	4.523	2.686	3.032	3.000	3.642
p-value	0.185	0.011	0.102	0.049	0.051	0.013
Hansen-J	—	1.507	—	2.607	—	2.900
p-value	—	0.220	—	0.106	—	0.235
Additional instrument						
Residence in Big City	No	Yes	No	Yes	No	Yes

Source: Authors' calculations using SHARELIFE data. Robust standard errors in parentheses. *p <0.1, **p <0.05, ***p <0.01. N=614. Dependent variables: Initial pension: ratio of initial pension to average pension in a particular year (in logs); Current pension: ratio of pension to average pension in 2006 (in logs). Additional controls as in Table 8, childhood controls and dispossession included. Instruments: number of prosecution or rehabilitation cases and/or residence in a big city in a year when the first job lost due to persecution ended (or in a year when the first job ended for those who never experienced persecution). F-test is the Kleibergen and Paap (2006) rank Wald F statistics of the excluded instruments in the first-stage regression. Hansen-J statistics for the null hypothesis $J = 0$ that the overidentification restrictions are valid.

Table 11: IV Estimation: Effect of Ever Losing a Job Due to Persecution on Pensions

	Instrument Based on Last Job					
	Prosecution		Rehabilitation		Prosecution and Rehabilitation	
Pension	(1)	(2)	(3)	(4)	(5)	(6)
Initial	-0.319*	-0.340	-0.351**	-0.295	-0.345**	-0.303
	(0.163)	(0.210)	(0.168)	(0.215)	(0.166)	(0.227)
Current	0.008	-0.039	-0.001	-0.033	-0.001	-0.031
	(0.065)	(0.074)	(0.065)	(0.074)	(0.065)	(0.073)
F-test	1.611	2.796	1.729	2.854	1.779	3.393
p-value	0.205	0.062	0.189	0.058	0.170	0.018
Hansen-J	—	0.972	—	4.000	—	4.522
p-value	—	0.324	—	0.045	—	0.104
Additional instrument						
Residence in Big City	No	Yes	No	Yes	No	Yes

Source: Authors' calculations using SHARELIFE data. Robust standard errors in parentheses. *p <0.1, **p <0.05, ***p <0.01. N=614. Dependent variables: Initial pension: ratio of initial pension to average pension in a particular year (in logs); Current pension: ratio of pension to average pension in 2006 (in logs). Additional controls as in Table 8, childhood controls and dispossession included. Instruments: number of prosecution or rehabilitation cases and/or residence in a big city in a year when the last job lost due to persecution ended (or in a year when the last job ended for those who never experienced persecution). F-test is the Kleibergen and Paap (2006) rank Wald F statistics of the excluded instruments in the first-stage regression. Hansen-J statistics for the null hypothesis $J = 0$ that the overidentification restrictions are valid.

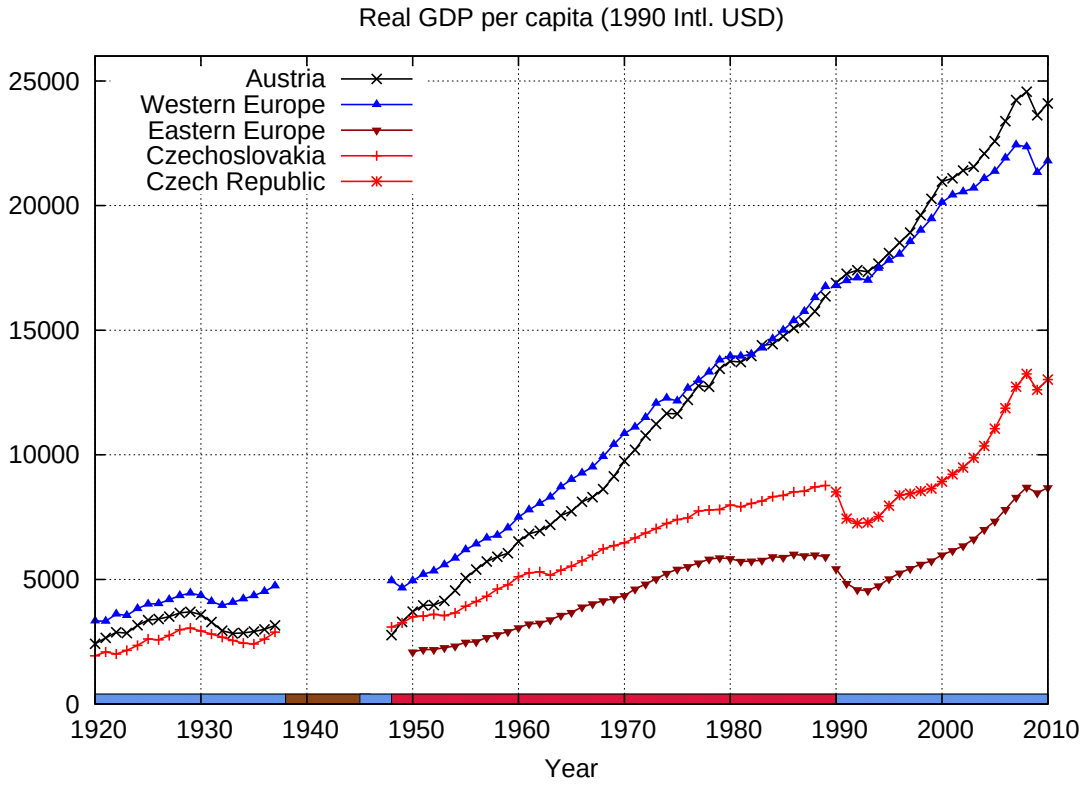

Figure 1: Real GDP Per Capita (1990 International Dollars)

Source: Maddison tables, Bolt and van Zanden (2013). Notes: Western Europe: Austria, Belgium, Denmark, Finland, France, Germany, Italy, the Netherlands, Norway, Sweden, Switzerland, and the United Kingdom. Eastern Europe: Albania, Bulgaria, Czechoslovakia, Hungary, Poland, Romania, and Yugoslavia.

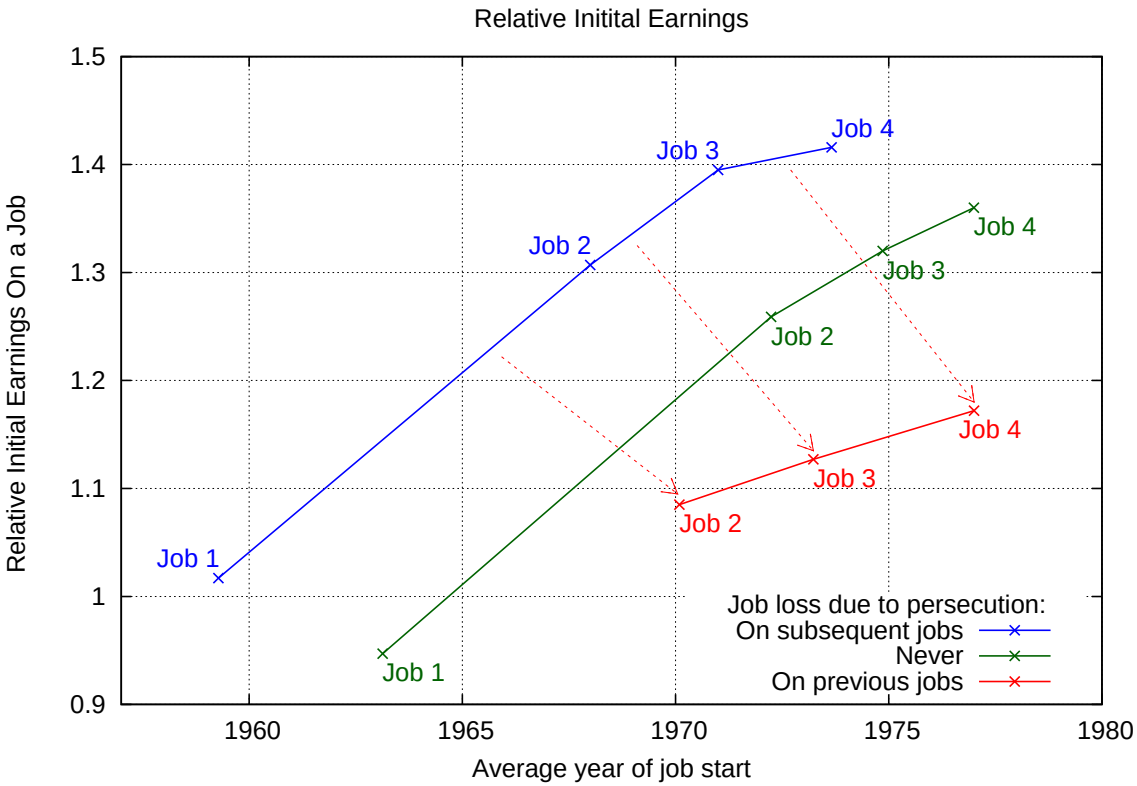

Figure 2: Job Loss Due to Persecution and Initial Earnings

Source: Authors' calculations using SHARELIFE data. Average relative initial earnings with indicated average starting years on the first, second, third, and fourth job.

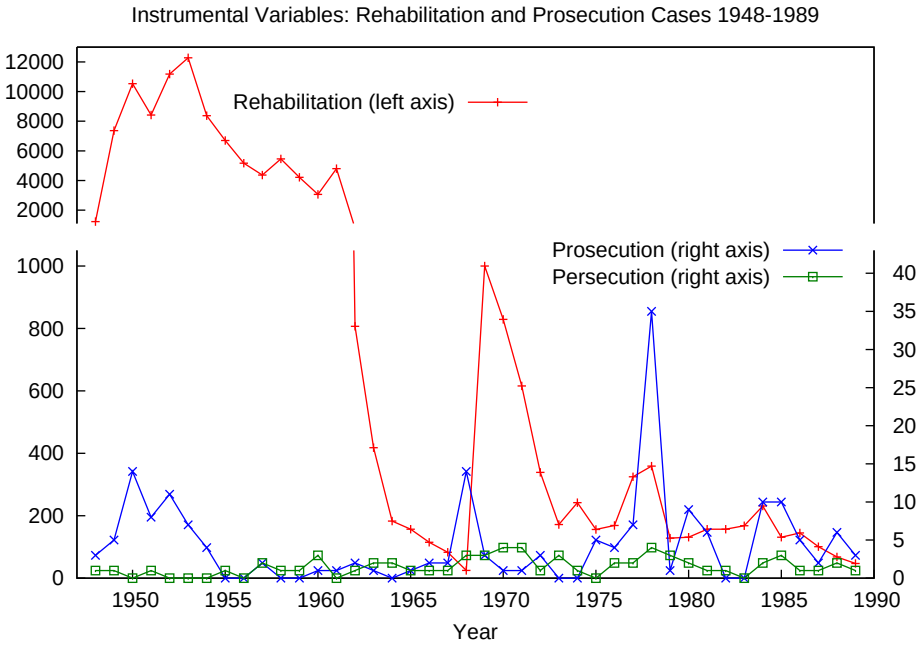

Figure 3: Instrumental Variables: Rehabilitation and Prosecution Cases

Source: Authors' calculations using Gebauer et al. (1993) statistics on the Judicial Rehabilitation Act 119/1990, the Bureau for Investigation and Documentation of the Crimes of Communism (BIDCC) of the Police of the Czech Republic, and SHARELIFE data. Rehabilitation (left axis): number of cases rehabilitated per year when sentence given, excluding emigration. Prosecution (right axis): number of prosecuted individuals per year when wrongdoing occurred. Persecution (right axis): job losses due to persecution from the SHARELIFE data in a given year.