Early Life Conditions, Time Preferences, and Savings

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Abstract

This study examines how early-life exposure to food scarcity influences individuals' long-term time preferences and savings behavior. To this end, we analyze hand-collected historical data on livestock availability during World War II at the provincial level, alongside detailed survey data on elicited time preferences and household savings. By leveraging differences across cohorts and provinces in a difference-in-differences framework, we find that individuals who experienced more severe scarcity during early childhood develop higher levels of patience later in life and tend to hold more savings, conditional on income. Our findings suggest that exposure to protein scarcity during the first seven years of life can instigate a lasting increase in prudent behavior in the form of a coping mechanism.

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1 Introduction

Time preferences play an important role in a wide array of economic decisions and are a key determinant of consumption and savings. There is substantial heterogeneity in time preferences within and across countries, with cultural, institutional and socioeconomic differences accounting for a fair portion of it (Becker and Mulligan, 1997; Falk et al., 2018). However, a significant part of this variation remains unexplained and there is still no consensus regarding the age at which individual time preferences are formed. While existing research has primarily focused on the short-term effects of socioeconomic disparities on time preferences (mainly in experimental settings–see Sutter et al., 2013), the long-term effects of early life experiences have largely been understudied.

In this paper, we fill this gap and show that early-life experiences have a long-lasting impact on individuals' time preferences and savings decisions, uncovering a nuanced heterogeneity in the effect of experiencing scarcity at different stages of early life. To do so, we exploit a shock that is arguably exogenous, that is, meat scarcity during World War II (WWII) in Italy. Our analysis utilizes newly digitized provincial-level historical data on the availability of different categories of food with particular emphasis on meat. Food scarcity and hunger were prevalent during WWII. We focus on meat scarcity due to an exogenous source, as a substantial portion of livestock was excised by the German army to meet their dietary needs.[1] We argue that the decline in the number of livestock resulted in a significant reduction in local meat availability during those years and estimate an Intention-To-Treat (ITT). Given that rationing and the prices in the black market depended on the local availability of food, our measure is likely to gauge the overall scarcity of meat during WWII. Importantly, we show that meat scarcity operates above and beyond other dimensions of the conflict, namely casualties, bombing, incidents of civilian victimization (Bertazzini and Giorcelli, 2022; Atella et al., 2024), and the drop in the fertility rate.

In our analysis, we use a difference-in-differences framework and leverage provincial and cohort variation in the number of animals slaughtered for meat across Italy.[2] Specifically, we compare the time preferences of individuals belonging to different cohorts (spent their early childhood during or after WWII) who were born in provinces with different degrees of meat scarcity (measured on a continuous scale) during WWII. To measure time preferences, we utilize uniquely elicited information from the 2004 Survey on Household Income and Wealth (SHIW) conducted by the Bank of Italy. Within the survey,

[1] Several unexpected events influenced the movement of the German troops. This included the Allied withdrawal for a new offensive in France and harsh weather conditions in October 1944 (Fontana et al., 2023). However, livestock distribution or local socioeconomic factors did not play a role.

[2] Adamopoulou et al. (2024) use a similar identification strategy, albeit with fewer and less granular data on meat scarcity, to examine the effects on health and eating habits. See Section 2.1 for more details.

household heads were asked to indicate the percentage of a hypothetical lottery prize, equivalent to their household's net annual income, that they would be willing to forego in order to receive the prize immediately instead of waiting for a year. Consequently, we can observe the different levels of patience among respondents and classify those who are willing to sacrifice the highest percentage as "impatient". We then investigate the implications of meat scarcity and patience on households' annual total savings.

We find that individuals who have experienced meat scarcity during early childhood exhibit greater patience later in life. In our benchmark specification, a 10% decrease in the number of livestock slaughtered for meat reduces the probability of being impatient in adulthood by 2.3 p.p. This effect is economically significant, as about 10% of people in our sample are classified as "impatient". We obtain this result in specifications that account only for demographics (gender, age) and socioeconomic characteristics of the family of origin (number of siblings, parental education and occupation) or for an extensive list of other factors that may affect patience (but are potentially endogenous), such as individuals' socioeconomic conditions (e.g., own education, household income, and wealth) as well as financial literacy, risk aversion and financial constraints. We are also able to exploit for identification the fact that some individuals reside in a different province than the province of birth. We do so by including province of residence fixed effects to control for unobserved differences across Italy while the scarcity shock refers to the province of birth (where the individuals spent their early childhood). We carefully conduct several robustness tests to rule out the possibility that the relationship between exposure to meat scarcity during childhood and patience later in life is driven by confounding factors (survival biases, post-war recovery of livestock, trade, and other dimensions of conflict) or the way scarcity is measured.

To shed light on the underlying mechanisms, we analyze the effect of scarcity on other outcomes, that could indirectly affect time preferences, namely, lower levels of income, wealth, education, or financial literacy. Moreover, we analyze the effects of meat scarcity at different ages of exposure and use additional historical information on the availability of other food groups, namely other sources of proteins beyond meat (legumes), carbohydrates (wheat, corn, and potatoes), and vitamins (tomatoes and apples)[3].

In our sample, we do not find clear evidence that scarcity adversely affects cognitive function. This finding is in line with a growing body of literature reporting null or mixed effects of financial strain and adversity on decision-making. For instance, Carvalho et al. (2016) do not find that financial strain impairs decision quality; Fehr et al. (2022) document instances where scarcity is associated with more rational decision-making; and Shai (2022) show that exposure to trauma can be linked to more future-oriented behavior, such as increased insurance uptake.

[3]We cannot observe, and therefore cannot control for, whether access to food produced and stored before WWII was available.

Our analysis further shows that the age of exposure to scarcity plays a crucial role. Specifically, we find that the effect on patience is concentrated on individuals aged 0-7 during WWII, with the largest impact observed in the 0–3 age group. This novel finding reveals that first years of life are critical periods for the formation of individual *time* preferences. Our results confirm the importance of the first years of life in the formation of preferences, risk attitudes, and cognitive development (Cunha and Heckman, 2007; Cronqvist et al., 2015; Webb, 2024). Additionally, we find that only the scarcity of high-protein foods (i.e., meat and legumes) affected individuals' patience levels.

Our findings suggest that both behavioral and biological mechanisms are at work. Individuals exposed between ages 4 and 7, beyond the most biologically sensitive window, show changes in time preferences. The lack of evidence for cognitive impacts in this group points to the role of learned behaviors or environmental influences. At the same time, we find a strong link between protein scarcity and increased patience. This effect is especially pronounced among those exposed between birth and age 3. This highlights the importance of early nutritional inputs during key developmental periods and supports the presence of a biologically driven mechanism.

Moreover, interdisciplinary evidence from psychology and biology supports the idea that early-life adversity may induce adaptive responses. For example, Mittal et al. (2015) find that early adversity can enhance certain aspects of executive function later in life, reflecting possible cognitive adaptations to stressful environments. Similarly, animal studies show that transient food insecurity during the juvenile–adolescent period can shape adult cognitive flexibility, influencing the ability to adapt to new or complex situations (Lin et al., 2022). Our findings suggest that individuals exposed to scarcity early in life may develop greater patience as a coping mechanism, in line with this broader literature on developmental adaptation. In other words, increased patience emerges as an adaptive response forged during sensitive periods of development.

Lastly, our setting provides with a credible instrument to establish a causal link between patience and savings.[4] In particular, we find that higher levels of patience due to early-life exposure to meat scarcity increase individuals' propensity to save later in life. Overall, our results suggest that individuals who were exposed to scarcity during early life develop a higher degree of prudence in adulthood as a coping mechanism: they are more patient and save more.

Related literature. The literature on time preferences documents considerable heterogeneity across countries, cultures and socioeconomic groups. Falk et al. (2018) attributes this heterogeneity to cultural, historical, and institutional differences. Harrison et al. (2002) show that while constant discount rates are a reasonable assumption for certain

[4]Our paper adds to a recent literature (Epper et al., 2020; Hübner and Vannoorenberghe, 2015; Sunde et al., 2022) that studies the association between patience and savings.

types of households, it is not appropriate to assume that the same discount rates apply to all households. Our study contributes to the understanding of the origins of heterogeneity in time preferences by shedding light on the timing of their formation. The literature on this is rather scarce. A recent exception is a study by Webb (2024) which shows that the age of 2 is the most critical period for children's cognitive development.

Previous studies have found a strong contemporaneous correlation between time preferences and scarcity of goods. Lawrance (1991) shows that poverty may lead to present-oriented preferences, while Golsteyn et al. (2014) find that individuals with higher socioeconomic status tend to be more patient. Moreover, scarcity of goods may lead to increased risk aversion (Dohmen et al., 2011) and a preference for immediate rewards over delayed costs (Lawrance, 1991). The underlying mechanism behind this behavioural shift is the experience of scarcity itself (Haushofer and Fehr, 2014; Mullainathan and Shafir, 2013), and recent research has explored the potential moderating role of the size of individual's choice set in this relationship (Gneezy et al., 2020). All the above papers primarily focus on the short-term relationship between poverty and current levels of patience. Our study instead investigates the causal, long-term effects of early life experiences on time preferences and savings.[5,6]

Traumatic events such as wars, recessions, natural disasters, health challenges, or the death of a relative are also factors that can impact economic behavior later in life. Research shows that experiencing this type of events can lead to a decrease in risk-taking behavior (Malmendier and Nagel, 2011; Koudijs and Voth, 2016; Døskeland and Kvaerner, 2021), preferences for redistribution (Roth and Wohlfart, 2018) and trust (Kesternich et al., 2020). Recent studies document that exposure to armed conflict has long-lasting effects on human capital and well-being. For instance, Akresh et al. (2023) show that exposure to the Biafran War affected two generations' human capital outcomes, while Akbulut-Yuksel et al. (2025) find persistent mental health effects of World War II exposure. Our paper complements this literature by focusing on a specific dimension of wartime adversity—food scarcity—and examining its long-term impact on economic preferences, while controlling for other aspects of the conflict, such as casualties, bombings, and civilian victimization, to isolate the effect of scarcity from broader wartime destruction. Unlike studies that emphasize the detrimental consequences of conflict on health and human capital, we show that early-life exposure to scarcity can increase patience, revealing an adaptive component of responses to extreme hardship.

[5]There is vast literature that analyzes the relationship between poverty and economic behavior in general (Bertrand et al., 2004; Blalock et al., 2007; Yesuf and Bluffstone, 2009; Agarwal et al., 2009; Shah et al., 2012; Fehr et al., 2022) but mainly focuses on the scarcity of financial resources (Carvalho et al., 2016; Ananyev and Guriev, 2018). Agneman et al. (2023) is a recent exception and investigates the impact of food scarcity on trust.

[6]Schaner (2018) examines the effects of temporary economic incentives on saving behavior, showing that low-income individuals learn from short-term changes in their financial environment and these experiences shape their saving behavior years later.

Evidence on the impact of natural disasters is more inconclusive. Méon et al. (2021) estimate long-term increases in patience and savings of individuals who experienced earthquakes in Mexico. By contrast, Filipski et al. (2019) and Kuralbayeva et al. (2019) show that households in China and Italy, who lived in quake areas but did not themselves suffer damages or injuries save less later on. In the same vein, Callen (2015) find that exposure to the Indian Ocean Earthquake tsunami increased patience among Sri Lankan wage workers, whereas Cassar et al. (2017) show that the same tsunami led to long-lasting increases in risk aversion and impatience among individuals in rural Thailand. These contrasting findings underscore the need for further research to better understand the nuanced relationship between trauma and patience.

Our study also relates to the literature that examines the long-term health consequences of early-life exposure to malnutrition or adverse weather conditions. These studies mainly find increased levels of obesity, decreases in height and increased hospitalization rates among affected individuals (Scholte et al., 2015; Kesternich et al., 2020; Adamopoulou et al., 2024). Given that impatience and obesity are positively correlated (Courtemanche et al., 2015), our finding that early-life scarcity increases patience suggests that our estimates may capture a lower bound of the long-term adaptive effects of scarcity.

Lastly, early life exposure to stressors and environmental factors may also result in long-lasting negative effects on cognitive development and labor market outcomes (Ichino and Winter-Ebmer, 2004; Maccini and Yang, 2009; Neelsen and Stratmann, 2011; Jürges, 2013; Atella et al., 2024; Santavirta, 2012). Our study instead uncovers a direct link between early life protein scarcity and time preferences–a key parameter for most economic decisions, including savings.

2 Data

2.1 Historical data on food scarcity

We build on and expand the work of Adamopoulou et al. (2024), which utilized variation across 18 Italian regions to study the effect of meat scarcity on health and eating habits. In contrast, our study integrates granular historical data on the availability of meat across all (102) Italian provinces with extensive survey data that delve into individual traits of patience and savings behavior.[7] Additionally, we enrich our data collection with

[7]To ensure comparability over time, we harmonize provincial identifiers to reflect the administrative boundaries in place during the 1940s. Several provinces were established after this period (Crotone, Lecco, Lodi, Verbano-Cusio-Ossola, Isernia, Prato, Rimini, Pordenone, Biella, Vibo Valentia, Oristano, Caserta, and Trieste). These are merged with their historical counterparts—Catanzaro, Como, Milano, Novara, Campobasso, Firenze, Forlì, Udine, Vercelli, Catanzaro, Cagliari, Napoli, and Gorizia, respectively.

information on the scarcity of other protein sources (fish and legumes), carbohydrates, and fruits, as well as fertility rates. Moreover, we hand-collect infant mortality rates and WWII-related casualties at the provincial level.

Italy serves as a focal point due to its historical context in the course of WWII, as meat availability was significantly impacted by external factors, plausibly of an exogenous nature. For our analysis, we digitize historical datasets detailing food availability at the provincial level during WWII and complement them with rich survey data on the attributes and economic behavior of various demographic cohorts several years after the end of WWII.

First, to quantify meat scarcity in each province, we compiled data on the number of livestock slaughtered for meat from the Annual Agricultural Statistics in 1941, 1942, and 1945 provided by the Italian National Institute of Statistics (ISTAT)–ISTAT (1948) and ISTAT (1950).[8] We measure meat scarcity as the change (in absolute value) in the number of slaughtered animals between 1945 and its level in 1941-1942. Additionally, we digitized data from livestock censuses conducted in 1942 and 1944, sourced from the ISTAT (1945) and ISTAT (1948) reports.[9] Our approach involves aggregating the counts of various livestock species – cattle, pigs, goats, and sheep – to gauge changes in meat availability. This method is supported by the relatively stable distribution of these species across regions (cattle predominantly in the North; goats, and sheep in the South). In a robustness exercise, we consider the weight (in quintals) of the livestock to construct our measure of meat scarcity. Furthermore, the 1944 census data includes information on the number of livestock confiscated by the German army in Central and Southern provinces, providing additional insights into the driving factor of provincial meat scarcity during WWII.

Second, the impact of the German invasion in Italy during WWII was not limited to meat scarcity through livestock excise; it also affected provinces in other significant ways, although the battles often took place elsewhere. To control for other aspects of the warfare at the provincial level, we utilize data on the number of war casualties from firearms and explosives, sourced from ISTAT (1957) reports, and data on bombing (in tons) and incidents of civilian victimization (Bertazzini and Giorcelli, 2022). These variables are standardized per 1,000 population of each province in 1936, as per ISTAT (1976) report.

Third, post-war recovery in meat availability varied across provinces. To account for differences in the speed of recovery across space, we gather data on the number of slaughtered animals for meat at the provincial level in 1946 and 1947, available in ISTAT (1945) and ISTAT (1950). We then create a variable that measures the change in the

[8] An extract of these reports, digitized for our study, is presented in Appendix A, Figure A.1.

[9] The 1944 livestock census entailed only the liberated territory (Center/South) and no livestock census was conducted in 1945. The next livestock census took place in the entire territory in 1948, when the number of livestock had already recovered to pre-war figures.

number of slaughtered animals between 1946-1947 and its level in 1941-1942 and use it as an additional control in the analysis.

Fourth, we collect data on several measures of food scarcity, including other sources of proteins beyond meat, namely legumes (beans and chickpeas), as well as carbohydrates (wheat, corn, and potatoes), and fruits (apples and tomatoes) in 1941-1942, and 1945. These data are obtained from the Annual Agricultural Statistics –ISTAT (1948) and ISTAT (1950)– and allow us to shed light on a potential biological mechanism due to the scarcity of certain nutrients. Furthermore, we gather data on fish catch production in 1936 from the 1937-1940 Industrial and Commercial Census of the Fish Industry – ISTAT (1940) – to examine the heterogeneous effects of meat scarcity between provinces with and without reported fish catch, as the former were presumably more likely to substitute meat with fish.[10]

Finally, to examine sample selection bias, we use data on infant mortality rates by province in 1943-1945 from the Supplemento Straordinario alla Gazzetta Ufficiale (1948) and compute the correlation between meat scarcity and infant mortality rates. Additionally, we leverage census records from ISTAT on survival rates by age and province in 2004 to investigate sample survival bias.[11] Lastly, we collect data from the official Demographic Newsletters on provincial fertility rates per 1000 people in 1941 and 1942 (ISTAT, 1942) and from (ISTAT, 1952) for the period 1943-1945 to measure the drop in the fertility rate in each province during WWII. We then use this variable as a control throughout the analysis.

2.2 Survey on Household Income and Wealth (SHIW)

Our analysis leverages historical data along with the 2004 Survey on Household Income and Wealth (SHIW) conducted by the Bank of Italy. The SHIW biennial survey offers rich information on households, including total savings, income, and wealth, as well as characteristics of household members such as age, gender, number of siblings, parental education and occupation, educational level, marital status, sector of activity, and retirement status. Notably, it includes information on the province of birth of the respondents, crucial for assessing the impact of meat scarcity early in life. This unique feature of the SHIW allows us to pin down the degree of meat scarcity in the province where individuals were likely born and lived during childhood. Summary statistics for our main variables are detailed in Table 1. Moreover, the survey provides information on the current province of residence, thus allowing us to exploit mobility for identification.

The 2004 wave of the survey introduced questions aimed at eliciting the patience levels of the household head, employing a six-point scale from "least patient" to "most patient."

[10] Unfortunately, there are no available data on reported catch between 1940 and 1945 to construct a measure of fish scarcity during that period.

[11] See https://demo.istat.it/app/?i=TVM&l=it.

Participants were asked to specify the fraction of a hypothetical lottery win they would be willing to forfeit for immediate access, rather than waiting a year. This hypothetical win was set to match their annual net household income, with options to forgo 20, 10, 5, 3, or 2 percent of the prize in order to receive it immediately.[12] We analyze patience as both an ordinal variable and as a binary variable called "*Impatient,*" which is equal to 1 if the individual opts to forego 20 percent. We also perform a robustness check that redefines the dependent variable, "*Impatient*," using a broader definition, where it is equal to 1 if the individual opts to forego either 20 or 10 percent.

A possible issue is that patience may reflect differences in financial literacy, risk aversion, or financial constraints. The former is partly mitigated by controlling for the educational attainment of individuals throughout the analysis. Moreover, in a robustness exercise, we add two variables that can directly approximate the financial literacy and risk aversion of the respondents. More specifically, the survey includes a question about the amount of time individuals spent each week seeking out financial news. Based on the responses to this question, we construct a categorical variable ranging from 0 to 5, representing the amount of time dedicated to staying informed about financial matters each week, from no time to 4 hours per week. We use this variable as a proxy for financial literacy along with sector of employment dummies. The survey also includes a risk aversion question. In particular, each participant is asked: "In managing your financial investments, would you say you have a preference for investments that offer: (1) very high returns, but with a high risk of losing part of the capital, (2) a good return, but also a fair degree of protection for the invested capital, (3) a fair return, with a good degree of protection for the invested capital, (4) low returns, with no risk of losing the invested capital." We use this categorical variable to control for risk aversion. In this extended specification, we also control for whether the respondent has a private health insurance and whether their household's disposable income is sufficient to cover monthly expenses, with responses ranging from 1 (great difficulty) to 6 (very easily).

3 Identification

3.1 Construction of the meat scarcity shock at the local level

As a first step, we construct a measure of meat scarcity at the provincial level using historical data from the annual agricultural statistics in 1941 and 1942 (before the start of the most severe phase of the war) and in 1945 (end of WWII in Italy). We calculate the percentage difference in the number of animals slaughtered for meat between the

[12]This question was asked again in subsequent waves (2008, 2010, 2012) but in some of those waves, it was administered only to half of the sample, excluding those born in 1943 and 1945. Additionally, the question was framed differently across waves, with some offering fewer options or changing the order of the options, making it difficult to analyze across waves.

1941-1942 average and that of 1945 in each province and obtain a measure in absolute value, with higher values indicating more severe scarcity levels.[13] Figure 1, panel a shows that meat scarcity increased sharply during WWII. There is considerable variation across provinces, ranging from 0 to 92%.

We posit that the primary driver of meat scarcity was the German army's livestock excise, aimed at fulfilling their dietary needs. As Figure 1 illustrates, meat scarcity at the provincial level (panel a) closely traces the movements of the German troops after the Allied invasion in September of 1943 (panel b). A possible issue is that these provinces might have been affected by the war in other dimensions, beyond meat scarcity. However, in many cases, the German troops excised meat from certain provinces while battles, bombings, or other atrocities took place elsewhere. Indeed, as Figure 2 shows, meat scarcity (panel a) at the provincial level and casualties (panel b), bombing (panel c), or incidents of civilian victimization (panel d) per 1000 population do not perfectly coincide–see the example of Lecce in the "heel" of Italy, which was solely affected by meat scarcity. Moreover, as Figure 3 illustrates, the correlation between meat scarcity and casualties, bombing, and incidents of civilian victimization at the provincial level is low. Still, to account for the possibility that the warfare may act as a confounding factor, we control for casualties, bombing, and incidents of civilian victimization per 1000 population throughout our empirical analysis. In addition, we conduct a series of robustness exercises excluding from the analysis individuals born in provinces where either i) casualties, or ii) bombing, or iii) incidents of civilian victimization per 1000 population were above the median.

We further corroborate that livestock excise significantly contributed to meat scarcity by using unique information from the 1944 census (ISTAT, 1945) on the number of livestock excised by the German army in the central-southern provinces (liberated territory).[14] We express it as a share of the number of livestock in 1942 and correlate it with the total percentage drop in the number of livestock between 1942 and 1944 (proxy of meat scarcity). Figure 4 shows the scatter plot along with the linear fit and confidence interval of the share of excised livestock and meat scarcity at the provincial level. As the figure shows, the German army confiscated up to 70% of the livestock in certain provinces (Frosinone, Latina). Furthermore, the correlation between the share of excised livestock and meat scarcity exceeds 80%, providing substantial support for the hypothesis that meat scarcity primarily stemmed from the excise conducted by the German troops.[15]

[13] In robustness exercises, we use i) the number of slaughtered animals for meat expressed in per capita terms by dividing by the number of the resident population in 1939 (last census conducted before WWII), ii) quintals of slaughtered animals for meat, iii) the number of animals according to the livestock census of 1942 and 1944. The latter was only conducted in the central-southern area of the country, which was at the time already liberated.

[14] The liberated territory in 1944 included the following regions: Umbria, Lazio, Abruzzo, Campania, Apulia, Lucania (Molise), Calabria, Sicily, and Sardinia.

[15] While data for the northern provinces is unavailable, various historical sources document exten-

We use the number of slaughtered animals for meat as this treatment has several advantages. First, differently from retrospective self-reported incidences of hunger, it is not susceptible to recall bias and it is less likely to be influenced by the socioeconomic status of the family of origin. The reduction in the number of slaughtered animals is arguably exogenous, given that the German army confiscated a significant portion of the available livestock as they traversed the territory. Indeed, the provinces experiencing the most substantial meat scarcity (e.g., Gorizia, as shown in Figure 1, panel a) were not those witnessing the highest number of casualties, bombing or incidents of civilian victimization per capita (e.g., Bologna, as illustrated in Figure 2, panels b), c) and d), and vice versa. Importantly, the movement of the German troops was not entirely their own decision, e.g., based on the livestock distribution or the socioeconomic characteristics of the local population (which may correlate with patience). Instead, their movement and the so-called "Gothic line" were also determined by a series of random events (divisions' withdrawal by the Allies due to a new offensive in France in August 1944, and the particularly harsh weather conditions in October 1944 –see Fontana et al. (2023)).

Second, during that period, access to meat was possible either through rationing or the black market. Both rationing and black market prices, in turn, were determined by the local availability of meat. Specifically, during WWII, Italy implemented a ration card system whereby various food items, including meat, could only be purchased in limited quantities using these special cards. Ration allocations varied by province depending on local supply (Massola, 1951). The State centrally administered the procurement and distribution of food through the *Sezioni Provinciali dell'Alimentazione* (Provincial Food Sections, see Luzzatto-Fegiz (1948)). As a result, many individuals had to resort to the black market for essential goods (Luzzatto-Fegiz, 1948; Daniele and Ghezzi, 2019). Since the black market was primarily local (often limited to interactions between urban and rural areas), the number of slaughtered animals at the provincial level likely reflects the overall local availability of meat (via both rationing and the black market), thereby offering a reliable gauge of the meat scarcity experienced by individuals during the war.[16]

The inefficiency of the rationing system (Morgan, 2007) and the exceedingly high inflation rate exacerbated the food shortage.[17] In some areas, certain items were completely unavailable due to import restrictions, while others like milk faced inter-provincial trade bans. Additionally, damaged transportation infrastructures significantly hindered the distribution and availability of goods. (Daneo, 1975). Therefore, in our context, it is unlikely

sive livestock confiscation in several areas of Friuli Venezia Giulia (Liuzzi, 2004) and Emilia Romagna (Arbizzani, 1976) following the entry of numerous German divisions into the Italian territory.

[16]Furthermore, it is reasonable to infer that livestock availability also serves as a proxy for the accessibility of other animal products such as milk, butter, and cheese, for which no provincial-level data exist in historical archives. National-level data indicate a notable decline in the availability of animal products (butter, cheese, lard, and milk) that parallels the decrease in meat availability–see Figure 5.

[17]In 1943, the consumer price index increased by 67.7% compared to the previous year, and in 1944 by 344.4% (ISTAT, 2012).

that spillover effects between the treated and control provinces can threaten identification. Finally, to address possible concerns that a decline in the number of slaughtered animals may also reflect reduced trade, we undertake a robustness exercise by excluding meat-intensive provinces (i.e., provinces with a very high number of slaughtered animals per capita in 1941-1942). Furthermore, as an alternative check, we aggregate meat scarcity at the regional level rather than at the province of birth.

3.2 Definition of the treated and control cohorts

As a second step, we use the year of birth of household heads to pin down the treated and control groups for our analysis.[18] Italy entered WWII in 1940 but most of the casualties (severe phase) occurred after 1942. We thus define as "treated" the cohort born in 1942-1945, i.e., individuals who passed their early childhood (ages 0-3) during the harshest years of WWII. The "control" cohort encompasses those born in 1946-1957, i.e., individuals who were born and passed their childhood after the end of WWII. In the first part of the analysis, we compare the 1942-1945 cohort to the 1946-1957 cohorts (aggregated). In the second part, we conduct event studies with more finely disaggregated cohort groups and also consider earlier cohorts (born in 1934-1941). Figure A.2 in Appendix A provides a timeline and illustrates how we define the treated and control cohorts.

As discussed in section 3.1, the decrease in the number of animals slaughtered for meat serves as a proxy for meat scarcity at the provincial level. Figure A.3 in Appendix A shows that livestock were present all across the Italian territory before the severest phases of WWII. This indicates that meat consumption was widespread across all provinces, and thus, a decline in livestock would negatively impact individual consumption. Figure A.4 in Appendix A shows that the average daily protein intake in the liberated territory in 1944 was about 30% lower than the minimum required for individuals engaged in heavy muscular work. Therefore, it is reasonable to assume that individuals born in provinces with significant declines in the number of animals slaughtered for meat were more likely to be subject to meat scarcity. Consequently, we compare a cohort exposed to varying levels of meat scarcity during childhood (depending on their province of birth) to cohorts who were not exposed and estimate an intention to treat (ITT).[19] Our final sample includes around 2,500 individuals.

Table 1 displays some descriptive statistics for our final sample and Table 2 separately

[18] Patience is only elicited among household heads and savings refer to the household as a whole. Given that the household head is typically the member responsible for family finances, we consider the cohort and the province of birth of the household head to study the effects on both patience and savings.

[19] By 1946-47, the number of animals slaughtered for meat had recovered to its pre-WWII levels in most provinces (see Figure A.5 in Appendix A), indicating that the observed fall in meat consumption during WWII was a deviation from its "steady state." Nevertheless, we include the recovery of animals slaughtered for meat at the provincial level as an additional control in a robustness check.

for the treated and control cohorts born in provinces subject to more and less severe scarcity. We see that individuals born in high-scarcity provinces are more patient and save more on average than those born in low-scarcity provinces. Moreover, this difference is larger for the treated (born 1942-1945) than the control (born 1946-1957) cohort (compare columns 3 and 7 in Table 2), suggesting that treated individuals exposed to more severe meat scarcity are relatively more patient and save more.[20] We test this formally in the following subsection.

Individuals from high- and low-scarcity provinces also differ in terms of household income, wealth, provincial-level changes in fertility rates, as well as provincial-level casualties, bombing, and incidents of civilian victimization per capita. However, this is true both for the treated and control cohort and the differences are almost identical. In our empirical analysis, we account for these differences by controlling for socioeconomic variables, casualties, bombing, and incidents of civilian victimization per capita and the drop in fertility rate at the provincial level, as well as by exploiting provincial variation *within* cohorts in a difference-in-differences setting.

3.3 Methods

In order to estimate the causal effect of meat scarcity during early childhood on patience later in life, we exploit cohort and provincial variation within a continuous difference-in-differences framework (DiD). We estimate the following specification:

$$\begin{aligned} Prob(impatient_{i,p}) =& \beta_0 + \beta_1 cohort_i + \beta_2 Scarcity_p \\ &+ \beta_3 (cohort_i \times Scarcity_p) \\ &+ \beta_4 X_{i,p} + \eta_p + u_{i,p}, \end{aligned} \tag{1}$$

where i stands for the individual and p for the province. The dependent variable is a dummy=1 for household heads who are classified as impatient (willing to forego 20 percent of a hypothetical lottery gain equivalent to their annual net household income to receive it immediately) and 0 otherwise.[21] The variable *Cohort* is equal to 1 if the household head is born in 1942-1945 and 0 if born in 1946-1957, and $Scarcity_p$ is the percentage drop in the number of animals slaughtered for meat during WWII, which is continuous and ranges between 0% and 92%. It is expressed in absolute value, with

[20] This pattern is also evident when examining the entire distribution of patience for the treated and control cohorts–see Figure 6, panel a and b.

[21] Given that the dependent variable "impatient" is binary, we estimate a linear probability model. We conduct robustness exercises by estimating a probit model and by considering the ordered variable "patience". Additionally, we redefine the dependent variable "Impatient" with a broader definition, which equals 1 if the individual opts to forego either 20 or 10 percent. We also perform robustness checks by excluding outliers, such as observations where the individual opts to forego 20 percent (least patient), or by excluding individuals with the highest patience level, i.e., those who are never willing to forego any percentage of the win.

higher values denoting more severe scarcity levels.[22] The coefficient of interest is β_3, i.e., that of the interaction between the cohort dummy and meat scarcity.

In the benchmark specification, the vector $X_{i,p}$ includes only exogenous controls, i.e., demographics of the respondent (age, age squared, gender) and socioeconomic characteristics of their family of origin (number of siblings, a binary variable equal to one if at least one parent attained a middle school degree, and a separate binary variable equal to one if the father held a high-skilled occupation).[23] Since World War II may have also affected individuals' educational attainment and earnings (Ichino and Winter-Ebmer, 2004; Atella et al., 2024), we propose an additional specification controlling for log household Net Income, log Wealth, educational attainment, retirement status, and marital status.[24] In a robustness exercise, we also account for financial constraints by controlling for whether the respondents' household's disposable income is sufficient to cover monthly expenses, with responses ranging from 1 (great difficulty) to 6 (very easily). Additionally, we include the amount of time individuals spent each week seeking out financial news as another proxy of financial literacy and sector of activity dummies (current for employees, last available for retirees), a measure of risk aversion, and whether the respondent has a private health insurance. However, the results do not depend on the inclusion/exclusion of any variable in this comprehensive –albeit potentially endogenous– list of controls. To avoid that WWII acts as a potential confounding factor, the benchmark specification also includes the total number of war casualties, bombing, and incidents of civilian victimization per capita as well as the drop in the fertility rate at the provincial level. This ensures that the treatment at the provincial level only captures meat scarcity rather than other aspects of the warfare. In the benchmark, war-related controls enter the model alone. In an alternative specification, we interact these province-level war controls with the cohort dummy to account for heterogeneous exposure across age groups, since the treatment effect is identified by the interaction of meat scarcity and cohort. In a robustness check, we also include a variable that measures the speed of recovery of livestock back to its pre-war levels by 1946-1947. Lastly, we re-estimate equation 1 by excluding from the analysis provinces in which either the per capita number of WWII casualties or bombings or incidents of civilian victimization were above the median.

SHIW is one of the few Italian surveys that contain information both on individuals' province of birth and residence. We exploit this feature of the survey for identification

[22] In alternative specifications we use i) a discrete treatment (high vs low scarcity) instead of a continuous one, ii) the per capita number of slaughtered animals for meat, iii) quintals of slaughtered animals, and iv) the number of animals according to the livestock census of 1942 and 1944. The latter was only conducted in the central-southern area of the country, which was at the time already liberated.

[23] We classify the following occupations as high-skilled: teachers, junior and senior managers, professionals, entrepreneurs, and self-employed freelancers. Conversely, individuals employed in blue-collar or clerical positions, as well as the unemployed, are categorized as non-high-skilled.

[24] Net income and wealth refer to the household as a whole, and we thus adjust them using an equivalence scale.

by exploiting "movers", i.e., individuals whose province of birth and current residence do not coincide. More specifically, we define the scarcity shock based on the province of birth (where they likely passed their childhood) but include in the specification province of residence dummies, η_p.[25] In this way, we compare individuals who reside in the same province but were born in different provinces. We thus cluster standard errors at the province of birth level (102 provinces).

To better link the drop in the number of livestock to a drop in meat consumption rather than reduced trade, we estimate a specification excluding provinces with a high (above the 90^{th} percentile) per capita number of animals slaughtered for meat in 1941-1942. Moreover, we explore possible spillovers onto adjacent provinces by aggregating the treatment variable (meat scarcity) at the regional level. Given that individuals living in provinces where fishing is common may have had easier access to other sources of protein, such as fish, which could potentially offset the lack of meat, we also conduct the analysis separately for individuals born in provinces with and without reported fish catch in 1936.

To check whether the effect is also present among individuals older than three years old during WWII, we expand the range of the treated group to those born in 1936-1945 (instead of 1942-1945) and carry out a more disaggregated analysis by 4-year cohorts in the spirit of an event study analysis. This exercise also allows us to confirm that the control cohorts were indeed unaffected. In the event study, we cluster standard errors by province and cohort, and the omitted cohort comprises of individuals born in 1954-1957. This ensures that the reference cohort spent their childhood in a period of full recovery.

One potential issue for our analysis is infant mortality. If the most vulnerable infants did not survive due to meat scarcity, this could lead to non-random selection in our sample. To address this issue, we correlate historical statistics on infant (first year of life) mortality at the provincial level with our measure of meat scarcity. Figure A.6 in Appendix A shows that there is no correlation between meat scarcity and fetal/infant mortality during WWII. A possible explanation is that breastfeeding is more important than meat intake for survival at the early age of 0-1. Moreover, infants were entitled to more generous rations in terms of calories than were adults or older children (Daniele and Ghezzi, 2019). Therefore, infant mortality is unlikely to affect our results for those aged 0-2 during WWII.[26] Additionally, we estimate equation 1 separately on provinces with low and high infant mortality to explore whether the effects are heterogeneous.

A similar concern could arise from survival biases among the household heads who participated in the 2004 wave of the SHIW. Note that the oldest cohort included in our analysis (event study) is respondents born in 1934, and aged 70 in 2004 (year of

[25] The provincial level controls, i.e., per capita casualties, bombing, incidents of civilian victimization, and drop in fertility rates, also refer to the province of birth.

[26] A similar type of bias could arise from selective fertility. However, contraception was quite ineffective in the period of analysis (Greenwood et al., 2021) and we control for the drop in fertility rate by province in all specifications.

the interview). To test for survival biases, we use census records of populations for the control cohorts (aged 47-58 in 2004), the treated cohorts in the main analysis (aged 59-62 in 2004), the older treated cohorts considered in the event study analysis (aged 63-70 in 2004), and six older cohorts (aged 71-76 in 2004) that are excluded from the analysis. The census records come from ISTAT[27] and report the survival rates by province and age in 2004. We construct cells by province and age and regress the survival rate in 2004 on age dummies, the meat scarcity shock at the provincial level, their interaction, and provincial dummies. Figure A.7 in Appendix A shows the coefficients of the interaction terms. We find no evidence of survival biases due to meat scarcity among the respondents included in our regression sample. Some weak signs of survival biases appear only at ages 72-73, among cohorts that are anyways, excluded from our analysis.

To ascertain whether the underlying mechanism is partly biological, we use additional information from the Annual Agricultural Statistics on the availability of other types of food and estimate the effects of scarcity on impatience by food category, namely, proteins (meat and legumes), carbohydrates (wheat, corn, potato) and vitamins (tomato and apple). However, we cannot cannot observe the availability of stored goods from before WWII. Lastly, we explore other potential channels through which meat scarcity could indirectly influence patience, namely, educational attainment, financial literacy, household income, and wealth.

4 Results

4.1 Effects on time preferences

To examine the effect of exposure to meat scarcity during early childhood on the individuals' time preferences in later life, we consider the probability of being impatient as an outcome variable and estimate the linear probability model specified in equation 1. Table 3, column (1) reports the results without any controls. The coefficient β_3 associated with the interaction term, $Cohort_i \times Scarcity_p$, is negative and statistically significant. In column (2) we add only exogenous controls, i.e., demographics of the respondent (age, age squared, gender) and socioeconomic characteristics of their family of origin (number of siblings, parental education and occupation) as well as provincial-level variables (per capita casualties, bombing, incidents of civilian victimization) to account for other aspects of the overall wartime hardship and the drop in fertility rate. The results remain stable.[28] This is our benchmark specification throughout the rest of the analysis.

Previous studies have shown how social and economic conditions affect individuals'

[27] https://demo.istat.it/app/?i=TVM&l=it

[28] Consistent with Falk et al. (2019), the coefficient of age is positive and statistically significant, indicating that older individuals are more likely to be impatient.

time preferences. For example, poorer individuals show a higher propensity to be impatient, Lawrance (1991). We therefore include in column (3) controls for log household Net Income, log Wealth, educational attainment, retirement status, and marital status.[29] We find that the estimated effect is robust to the inclusion of these controls. The coefficients of own income, high parental education and occupation are all negative. We thus confirm previous literature that shows a negative correlation between patience and both individual and parental socio-economic status (Haushofer and Fehr, 2014).

In terms of magnitudes, the benchmark estimates imply that a 10% decrease in the number of livestock slaughtered for meat in the province of birth (i.e., increased meat scarcity) among individuals who were aged 0-3 during WWII (compared to those born after the war) reduces the probability of being impatient in adulthood by 2.3 p.p. Given that about 10% of the individuals in our sample are defined as "impatient", this effect is economically significant.[30]

Next, we perform an event study analysis that unfolds the overall average effect for different cohorts. In the event study, the control cohort comprises individuals born in 1954-1957, i.e., when Italy had fully recovered from the consequences of WWII. We report the benchmark result by 4-year cohort groups in Figure 7. The effect of meat scarcity on the likelihood of being impatient in adulthood is statistically significant for individuals born during WWII (cohort 1942-1945), suggesting that meat scarcity in early childhood (ages 0-3) is pivotal and can have long-lasting effects on individuals' patience levels. In addition, there is a statistically significant effect for the cohort born between 1938 and 1941, who were between 4 and 7 years old during the period of scarcity. This suggests that while early childhood appears to be the most sensitive period, exposure during slightly later childhood may also influence the development of time preferences. Older cohorts (1934-1937) and individuals born after the war exhibit no statistically significant effect. This result is in line with the economic literature on the long-term effects of early childhood experiences (Almond et al., 2018) and on the role of early life conditions in the formation of cognitive and non-cognitive skills (Cunha and Heckman, 2007; Webb, 2024).

4.2 Robustness

As discussed in the identification section, we posit that the primary driver of provincial-level meat scarcity was the livestock excise by German troops, rather than broader

[29] As some of these variables may be endogenous to the treatment, we do not include them in the benchmark.

[30] The coefficient of the $Cohort_i$ variable (aged 0-3 during WWII) is positive, indicating that individuals in this cohort are more likely to be impatient compared to those born after the war. However, the coefficient of the interaction term ($Cohort_i \times Scarcity_p$) is negative, suggesting that the increased meat scarcity they experienced in early childhood reduces their impatience later in life. As this is a difference-in-differences specification, the significant difference in impatience comes from the variation in meat scarcity within the cohort exposed to it, not from the cohort effect alone.

wartime destruction. Figure 1 supports this claim by showing that meat scarcity closely tracks the movement of German forces after the Allied invasion, while Figure 2 and Figure 3 illustrate that meat scarcity is only weakly correlated with other wartime hardships such as casualties, bombing, and civilian victimization. Nevertheless, to ensure that our estimates are not confounded by these dimensions of the war, we perform a series of robustness tests.

Table 4 presents these exercises. In columns (1) to (3), we sequentially include interaction terms between cohort and three war-related variables: war casualties per capita, bombing intensity (in tons), and civilian victimization incidents. These interactions allow us to test whether differential exposure to wartime violence across cohorts drives our results. In all cases, the interaction terms are statistically insignificant, suggesting that these factors do not confound our main estimates. Additionally, we conduct three exclusion-based tests to further rule out the influence of wartime hardships. In column (4), we re-estimate equation 1 using only provinces with war casualties per capita below the median. Similarly, column (5) excludes provinces that experienced above-median bombing intensity, and column (6) excludes those with a high number of civilian victimization incidents. Across all three specifications, the coefficient on the main interaction term remains stable and statistically significant, reinforcing the robustness of our findings to a wide range of potential wartime confounders.

We further conduct a battery of robustness tests to address additional threats to identification and confirm the causal interpretation of our main result in Table 3. Table 5 displays the estimates of all additional exercises. In column (1), we control for the heterogeneity in the recovery of meat availability after WWII. If meat scarcity did not recover after WWII in affected provinces, then individuals born in those provinces after the end of the war would also be treated. We account for this by including in the regression $Recovery_p$, a continuous variable measuring the percentage change in the number of slaughtered animals for meat reported in the ISTAT annual agricultural statistics for 1941-1942 and 1946-1947. The main coefficient of interest, β_3, remains negative and statistically significant, Thus, differences in the recovery of meat availability do not pose a threat to our identification strategy. In column (2), we further strengthen our approach by excluding individuals born in 1946–1947 from the control group, thereby eliminating any potential influence of the recovery period. In column (3), we check whether our results reflect differences in individual financial literacy, risk aversion or financial constraints. Previous studies have shown that individuals who collect financial information tend to have higher discount rates than those who do not –see Meier and Sprenger (2013). Moreover, risk aversion may influence the elicitation of time preferences –see Frederick et al. (2002). Therefore, we include a proxy for financial literacy, i.e., a categorical variable ranging from 0 to 6 based on the number of hours per week that each individual spends reading financial news as well as a direct measure of risk aversion elicited by SHIW. We

also include employment sector dummies to control for any other unobserved job-related characteristics (e.g., employment in the financial sector) and whether the respondent's household's disposable income is sufficient to cover monthly expenses, with responses ranging from 1 (great difficulty) to 6 (very easily), as an additional proxy for financial constraints. Furthermore, we control for whether the respondent has a private health insurance. Lastly, we interact our proxies for World War II hardship with $Cohort_i$ to account for the heterogeneous impact of WWII on the different cohorts of individuals in our sample. The results reported in column (3) with this extended set of controls are perfectly in line with our benchmark estimates.

Next, we conduct several robustness tests on the definition of our shock variable. First, we estimate equation 1 using a discretized version of $Scarcity_p$. In particular, we redefine it as a binary variable equal to one for all those provinces with values of $Scarcity_p$ above the median. This ensures that our results are not driven by a few outliers in the distribution of meat scarcity across provinces. The coefficient associated with the interaction term in column (4) remains negative and highly statistically significant. Second, we express the treatment variable in per capita terms, i.e., we divide $Scarcity_p$ by the 1936 population level in each province. This approach guarantees that the effect is not influenced by factors such as provinces where the livestock population greatly exceeds the number of residents. The coefficient of the interaction term in column (5) continues to be negative and statistically significant.[31] Third, as mentioned in Section 3.1, our main measure of meat scarcity is the sum of different species of slaughtered animals. This is because the various provinces typically specialize in the production of certain species and our treatment variable is based on the percentage difference over time within each province. In column (6) we redefine meat scarcity as the percentage change in the *weight* of slaughtered meat between 1941-1942 and 1945 at the provincial level and the results are very similar to the benchmark estimates. Fourth, slaughtered animals for meat represent only a portion of total livestock. Total livestock is available from the livestock census that took place in 1942 and 1944 (only liberated territory). Thus, in column (7) we measure meat scarcity as the percentage difference in the number of total livestock–see Section 3.1. Again, we obtain similar estimates to our benchmark specification.

We then perform two tests to discard the possibility that the disruption of trade during WWII is driving our results rather than the drop in meat consumption. First, we estimate equation 1 excluding the provinces where a large part of meat production was for trade purposes. To do so, we calculate the per capita number of animals slaughtered for meat in 1941-1942 and exclude those provinces with a value above the 90th percentile. Second, we compute meat scarcity aggregated at the region rather than at the province of birth level to account for possible spillovers between adjacent provinces. We report the

[31] The size of the coefficient β_3 in columns (4) and (5) is not directly comparable to that in the rest of the columns as the treatment variable in columns (4) and (5) has a different mean.

results in columns (8) and (9) respectively. In both cases, the coefficient of the interaction term is negative, statistically significant, and similar in size to the benchmark estimate.

Finally, we check whether our results are robust to the way we define our outcome variable, to outliers, and to the estimation method. Table B.I, column (1), in Appendix B shows the benchmark results. The results remain robust when, in column (2), we redefine the dependent variable "Impatient" with a broader definition, where it equals 1 if the individual opts to forego either 20 or 10 percent. In column (3), excluding individuals who opt to forego 20 percent (the least patient) also yields consistent results. Similarly, in column (4), excluding those with the highest patience—i.e., individuals who are never willing to forego any percentage of the win—does not affect the robustness of the benchmark estimates. In column (5) we obtain a marginal effect of similar size as the benchmark estimate if we estimate a Probit instead of a Linear Probability Model.[32] In column (6), we use the ordinal variable "patience" instead of the dummy impatience as an outcome variable in the OLS estimation. Patience is measured on a six-point scale ranging from "least patient" to "most patient". We find that an increase in meat scarcity during childhood by 10% leads to a 13% increase in the patience score, which corresponds to roughly a 0.65-point increase on the six-point scale of patience.

4.3 Heterogeneous effects

In this section, we conduct several sample splits to investigate whether our findings are heterogeneous across different groups. First, we use the reported information on the educational level of the interviewees' parents to proxy for the socioeconomic background of the family of origin. More affluent families may have had better access to meat through the black market as they were less financially constrained. We thus create the dummy variable "High Parental Education" equal to one if at least one of the interviewee's parents has a middle school certificate or a higher degree. As reported in Table 1, around 20% of individuals in our sample have a parent with a high level of education. Columns (1) and (2) in Table 6 show that meat scarcity during early childhood increases patience in late adulthood solely among individuals of lower socioeconomic background, who probably had greater difficulty in acquiring meat through the black market (the effect is negative but not statistically significant among individuals of higher socioeconomic background). Second, we examine possible differences by gender in the response to the lack of meat. Columns (3) and (4) show that meat scarcity equally affected both female and male individuals.[33] Third, we examine whether intra-household dynamics, such as competition for scarce nutritional resources, vary by sibling gender composition. Columns (5) and (6)

[32] Figure A.8 in Appendix A also reports the marginal effect of $Cohort_i \times Scarcity_p$ estimated using the method of Ai and Norton (2003) for interaction effects in non-linear models.

[33] Given that our analysis is limited to household heads, females in our sample may not be representative of the entire female population.

show that the effect of early-life meat scarcity on impatience is stronger among individuals with at least one male sibling relative to those with at least one female sibling. This pattern may suggest that nutritional deprivation had a more pronounced impact in contexts of higher intra-household competition, potentially reflecting preferential treatment of sons over daughters, as discussed in Adamopoulou et al. (2024). Fourth, we study possible heterogeneous effects across individuals born in provinces that witnessed less or more pronounced increases in infant mortality rates during WWII. For each province, we compute the percentage increase in infant mortality rate between 1940 and 1945. We then create the dummy variable "High Infant Mortality" equal to one if the increase in infant mortality rate in a province was above the sample median. Columns (7) and (8) show that the effect of meat scarcity is similar among low and high infant mortality provinces. Therefore, we are confident that our results are not driven by sample selection issues due to different infant mortality rates across provinces. Finally, we investigate potential variations in the effects across individuals born in provinces with and without reported fish catch in 1936. Provinces with fish catch may have had access to alternative protein sources, such as fish and shellfish, potentially mitigating the impact of meat scarcity. Columns (9) and (10) show that meat scarcity similarly affects both groups. Therefore, the availability of fish did not help to compensate for the scarcity of meat.

4.4 Mechanisms

The effect of meat scarcity on patience can be explained both through a behavioral and a biological mechanism. To shed light on the possible pathways, we examine whether the lack of specific nutrients during early life is pivotal, using additional information from the Annual Agricultural Statistics on other food groups' availability. In particular, we utilize data on the availability of other sources of proteins beyond meat (legumes), carbohydrates (wheat, corn, potatoes), and vitamins (tomatoes, and apples) at the provincial level. For each food category, we calculate the percentage difference in the quantity available between the 1941-1942 average and that of 1945 in each province and obtain a measure in absolute value, with higher values denoting more severe scarcity levels.[34] We then estimate equation 1 for each of the above food groups. Table 7 contains the results. Columns (1) and (2) show a negative and statistically significant effect of the scarcity of protein-rich food, i.e. meat and legumes, on the probability of being impatient. By contrast, we do not find any statistically significant effect of the scarcity of carbohydrates (columns 3, 4, and 5) or vitamins (columns 6 and 7). Thus, protein rather than general food scarcity may be more relevant in shaping long-term patience, although the evidence is primarily driven by meat.

[34]We cannot observe, and therefore cannot control for, whether access to food produced and stored before WWII was available.

Next, in Table B.IV we investigate whether exposure to meat scarcity affected individuals' socioeconomic status which in turn could influence patience. In particular, we examine the effects on educational attainment, financial literacy, household income, and wealth. Table B.IV presents the results. Although the coefficient of $Cohort_i \times Scarcity_p$ is negative for all outcomes considered, none is close to being statistically significant. Hence, it is unlikely that these factors have indirectly shaped the patience of individuals exposed to meat scarcity early in life. Our results indicate that early-life scarcity may not hinder cognitive function, in line with research showing that scarcity and adversity do not necessarily impair decision-making (Carvalho et al., 2016; Fehr et al., 2022; Shai, 2022). These studies report null or even positive effects of financial strain and adversity on decision quality and future-oriented behavior.

The absence of significant effects on cognitive outcomes, combined with the persistence of the effect among individuals exposed between ages 4 and 7 (Section 4.1)—a period less sensitive to biological programming —points toward a behavioral mechanism. At the same time, the statistically significant association between protein scarcity and greater patience, along with the finding that the effect is stronger for individuals exposed between ages 0 and 3 compared to those exposed between ages 4 and 7, provides suggestive evidence of a biological channel. Moreover, evidence from psychology and biology suggests that early-life adversity can lead to adaptive cognitive outcomes. For example, (Mittal et al., 2015) find that early-life adversity can enhance certain aspects of executive function later in life, reflecting possible cognitive adaptations to stressful environments. Similarly, animal studies demonstrate that transient food insecurity during the juvenile-adolescent period impacts adult cognitive flexibility, influencing the ability to adapt to new or complex situations (Lin et al., 2022). Our findings suggest that individuals exposed to scarcity early in life may develop greater patience as a coping mechanism, consistent with a broader interdisciplinary literature on developmental adaptation.

4.5 Implications for savings behavior

Our main finding is that individuals who were exposed to meat scarcity at the critical ages of 0-3 exhibit higher levels of patience as adults. Increased patience in turn can alter the saving behavior of these individuals. To understand the implications of increased patience for savings we adopt a 2SLS procedure and regress *log(household savings)* on the probability of the household head being impatient, instrumenting the latter with the meat scarcity shock. The First-Stage regression is in essence equation 1.

The Second-Stage regression is:

$$log(savings)_{i,p} = \gamma_0 + \gamma_1 cohort_i + \gamma_2 \mathbb{1}(\widehat{impatient})_{ip} + \gamma_3 X_{i,p} + \eta_p + u_{i,p}, \tag{2}$$

where i stands for the individual and p for the province. We use an equivalence scale for all

household-level variables, namely savings, income, and wealth, to account for differences in the number of household members. The vector $X_{i,p}$ contains the same set of variables as in equation 1 with the addition of the households' log(Net Income).

Table 8 column (3) reports the results of the Second-Stage regression. Conditional on household income and wealth, the coefficient of the impatient dummy is negative. This implies that a reduction in the household head's likelihood of being impatient will lead to an increase in household savings.[35] The estimate in Table 8, column 3 is statistically significant and is robust to controlling for an extensive list of controls (Table 8, column 4).[36] The F-statistic of the first stage is above 10, and to our knowledge, this is one of the few examples in the literature that establishes a *causal* link between patience and savings –see Sunde et al. (2022).

In terms of magnitudes, the First-Stage results in Table B.II suggest that exposure to meat scarcity early in life decreases the probability of being impatient by 2.7 pp. Then, according to the Second-Stage estimates in Table 8, column 3, being impatient decreases log(savings) by approximately 2.2%. By combining the two, our estimates imply that exposure to meat scarcity during the critical age of 0-3 increases household savings by around 6%. We obtain a similar effect (6.1%) when we estimate the reduced form regression, i.e. when we directly regress log(savings) on the meat scarcity shock (see Table 8, columns 1 and 2). Hence, meat scarcity in early childhood affects not only the individuals' patience levels but also their savings decisions.

This result further supports the notion that affected children became more prudent and stresses the importance early-life conditions for the formation of time preferences and its consequences on savings.

5 Conclusions

Past experiences exert a significant influence on various economic decisions, including savings and belief formation. Building upon this understanding, our study explores the impact of past experiences on time preferences, and more specifically patience, which is a critical parameter in economic decision-making. We contribute to the understanding of the heterogeneity of time preferences and show that it is crucial to consider a long-term perspective. We show that significant events experienced during the critical period of the first years of life have a substantial impact on individuals' time preferences. More

[35] Table B.II reports the results of the First-Stage regression which are perfectly in line with the main estimates shown in Table 3.

[36] We conduct a series of robustness tests to ensure that the documented effect does not depend on zero household savings in the dependent variable. In Table B.III, columns (1) and (3), we repeat the analysis with $log(1+savings)$ as an outcome variable, and in columns (2) and (4) we apply the inverse hyperbolic sine (arcsinh) transformation to household savings. The estimates remain statistically significant and exhibit a slight increase in magnitude.

specifically, we provide compelling evidence that individuals exposed to meat scarcity during childhood exhibit greater levels of patience later in life.

Using hand-collected historical archives and rich survey data, we examine the causal effects of an arguably exogenous local shock to meat availability during childhood on later outcomes, employing a difference-in-differences framework. We find that individuals who experienced greater exposure to meat scarcity in their early years demonstrate higher levels of patience. Additionally, they accumulate increased savings in adulthood. Our results suggest that time preferences begin to develop early, even before the age of three, and continue to be shaped up to the age of seven. These findings can be informative for the design of interventions aimed at increasing patience, similar to those implemented by Alan and Ertac (2018), which focused on elementary school-aged children. Given that time preferences start to form much earlier, such interventions may be even more effective if implemented during earlier developmental stages, such as in kindergarten.

To understand the underlying mechanisms, we examine the effects of nutritional scarcity across age groups (0–3, 4–7, and 8–11), nutrient types (proteins, carbohydrates, and vitamins), and intermediary outcomes potentially linked to time preferences, such as education, income, wealth, and financial literacy. Our results indicate that the impact on patience is most pronounced among individuals exposed between ages 0 and 3, but remains evident among those exposed between ages 4 and 7, highlighting early childhood as a particularly sensitive period. Furthermore, only the scarcity of high-protein foods—specifically meat and legumes—is associated with increased patience. Together, these findings support the presence of both biologically and behaviorally mediated mechanisms.

The increase in the level of patience and savings that we uncover –conditional on any possible effect on cognition– may be interpreted as an adaptive response, specifically as a coping mechanism developed in response to the past experience of scarcity. Although early-life scarcity represents a significant hardship with potentially serious negative consequences, individuals who experience such conditions may develop compensatory behaviors that improve long-term planning and self-control. This is in line with literature from psychology and biology showing that early adversity can lead to cognitive and behavioral adaptations–such as enhanced executive function and cognitive flexibility–that help individuals better navigate uncertainty and complex environments.

Our findings provide valuable insights into the intricate relationship between early-life protein shortages, time preferences, and saving behavior and can be particularly relevant for developing countries or countries that experience conflict nowadays. We highlight the lasting impact of protein shortages during critical periods child development, suggesting that policy interventions should focus on alleviating these shortages. This approach is crucial for supporting long-term behavioral and economic outcomes, as saving behavior plays a pivotal role in household economic planning and has significant implications for

addressing household poverty and improving overall economic growth.

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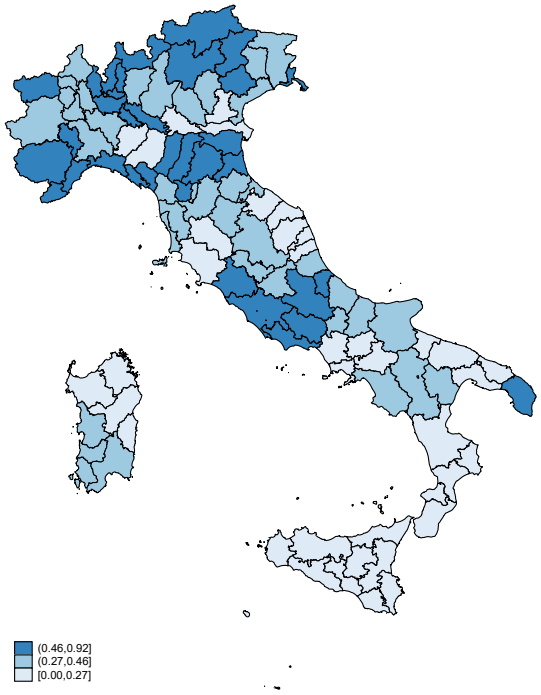
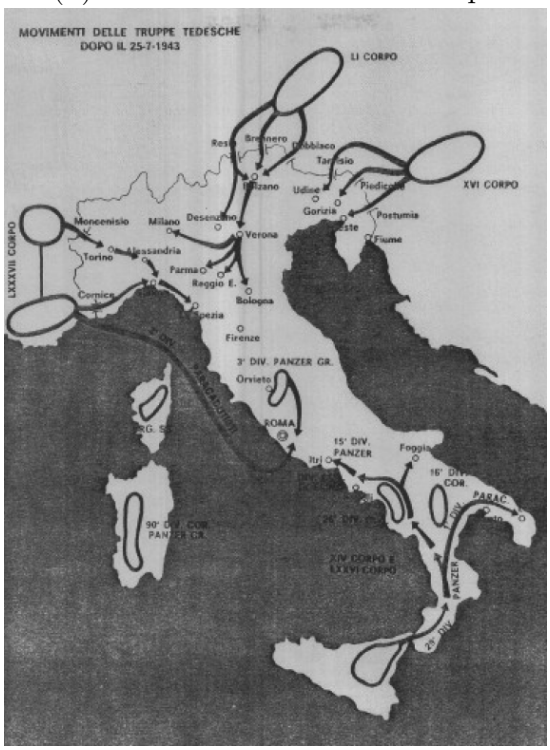
Figures

Figure 1: **Movement of German troops after 1943 and meat scarcity**

(a) Our measure of meat scarcity

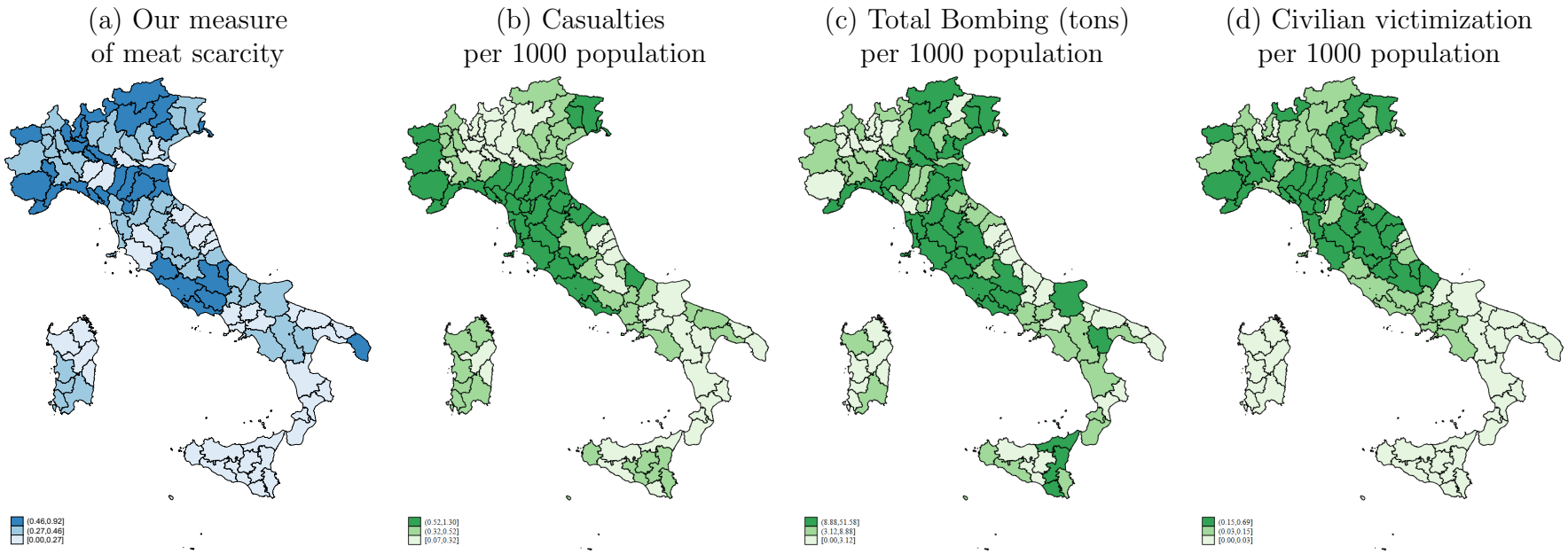


(b) Movement of German troops



Notes: The figure compares our measure of meat scarcity defined as the percentage difference (in absolute terms) in the number of animals slaughtered for meat between 1941-1942 and 1945 as a proxy of meat scarcity at the regional level. The drop ranges between 0 and 92% (a) to the movement of German troops after the armistice signed on September 8, 1943 (b).
Sources: (a) Annual Agricultural Statistics 1941, 1942 (ISTAT, 1948) and 1945 (ISTAT, 1950) (b) Gandini (1995).

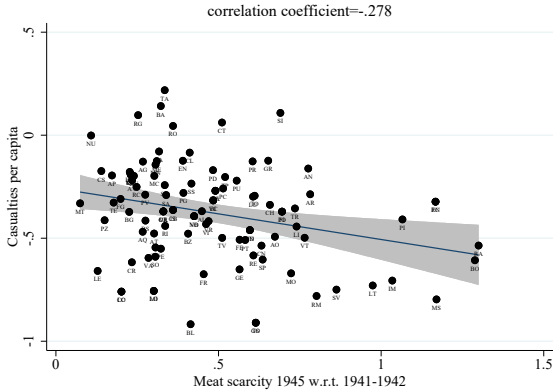
Figure 2: **Meat scarcity and other dimensions of warfare during WWII**



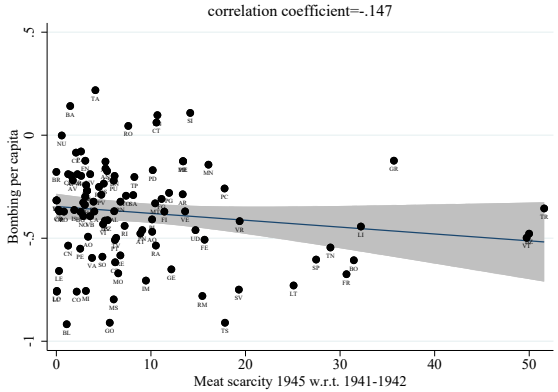
Notes: The figure compares our measure of meat scarcity as reported in Figure 1 (a), and other dimensions of the warfare, namely, the number of war casualties per 1000 population (b), total bombing in tons per 1000 population (c), and incidents of civilian victimization per 1000 population (d).
Sources: (a) see notes of Figure 1, (b) ISTAT (1957), (c) and (d) Bertazzini and Giorcelli (2022).

Figure 3: **Correlation between meat scarcity and other dimensions of warfare during WWII**

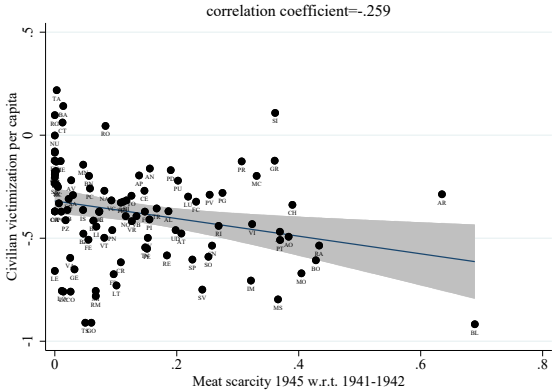
(a) Casualties



(b) Total Bombing (tons)

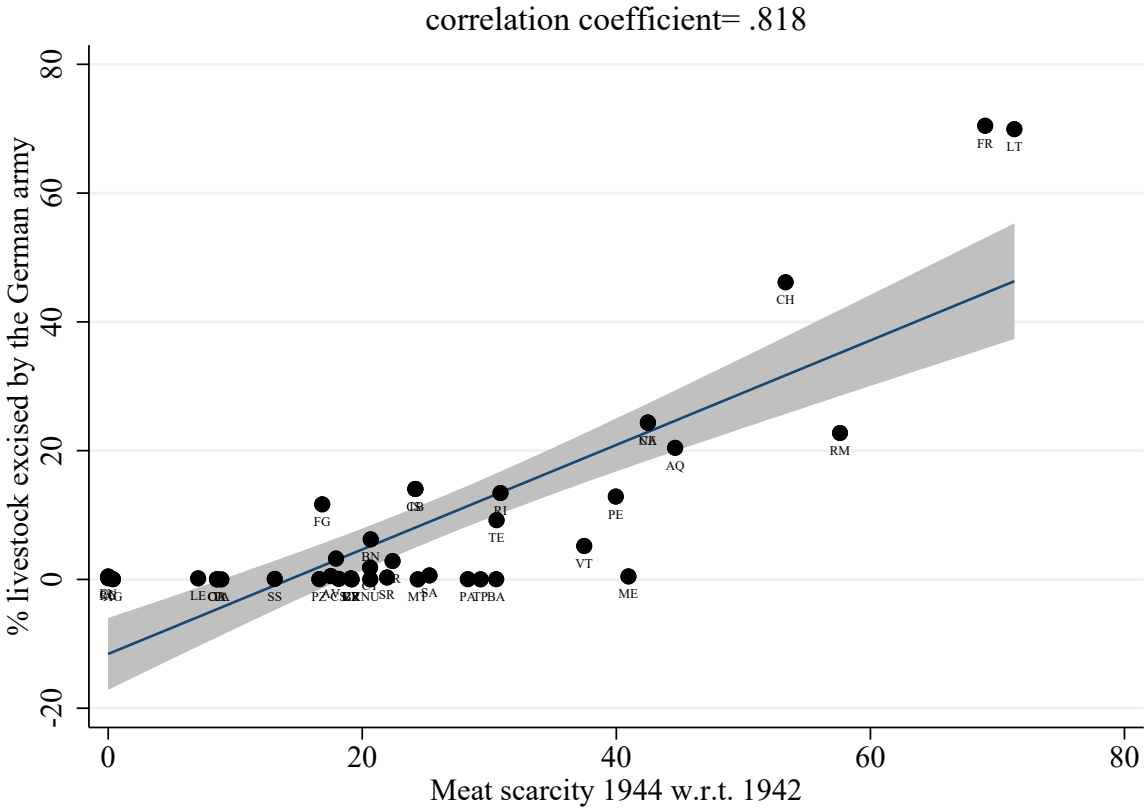


(c) Civilian victimization



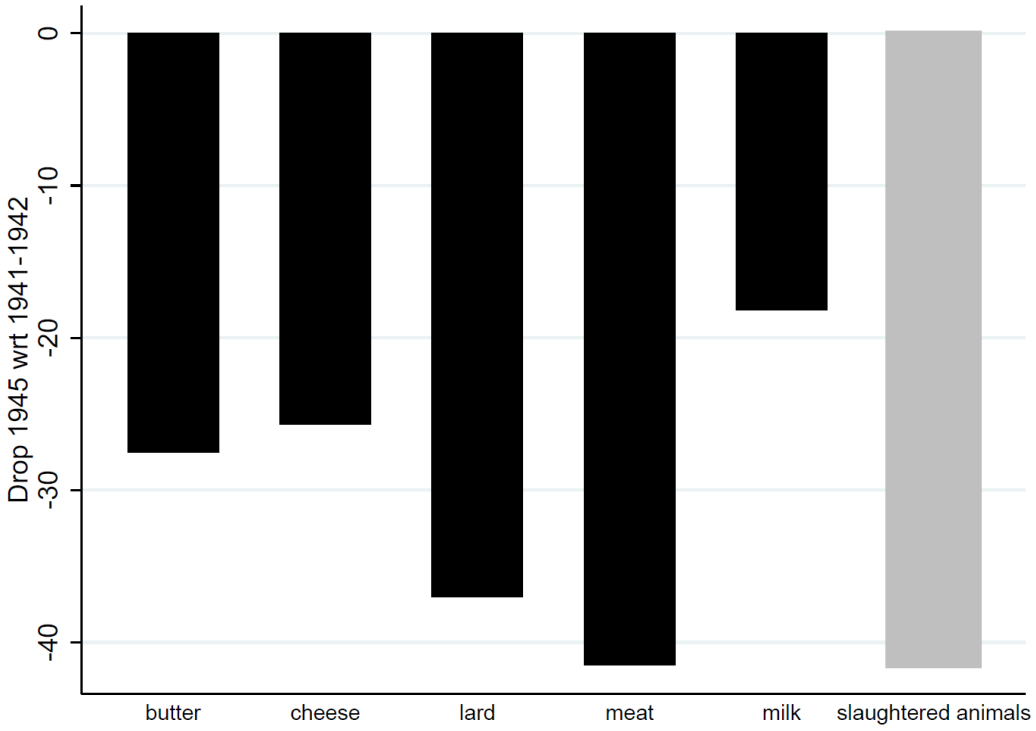
Notes: The figure depicts the correlation between the % change (in absolute terms) in the number of animals slaughtered for meat between 1941-1942 and 1945 and other dimensions of the warfare, namely, the number of war casualties per 1000 population (a), total bombing in tons per 1000 population (b), and incidents of civilian victimization per 1000 population (c).
Sources: see notes of Figure 1 and (a) ISTAT (1957), (b) and (c) Bertazzini and Giorcelli (2022).

Figure 4: **Correlation between meat scarcity and share of livestock excised by the German army**



Notes: The figure depicts the correlation between the % change (in absolute terms) in the number of animals slaughtered for meat between 1941-1942 and 1945 and the share of livestock excised by the German army at the provincial level.
Sources: see ISTAT (1945) and notes of Figure 1.

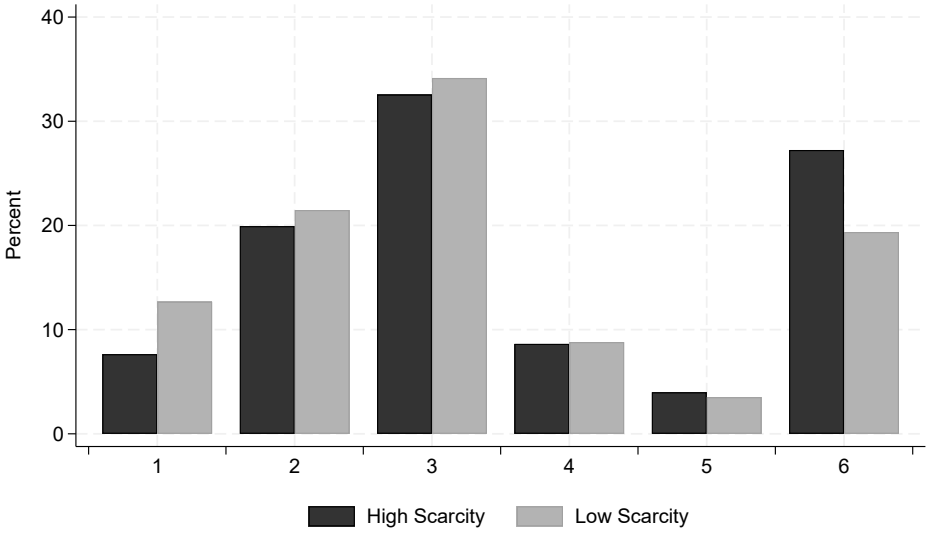
Figure 5: Drop in the availability of animal products and in the number of slaughtered animals for meat at the national level



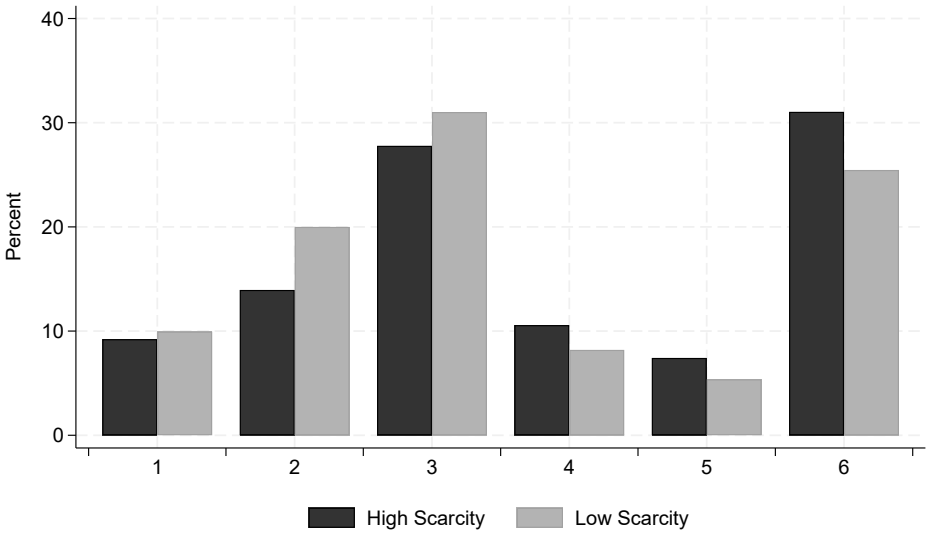
Notes: The figure shows that our measure of scarcity based on the number of livestock perfectly matches the drop in the availability of meat at the national level. Moreover, it is highly correlated with the drop in the availability of other animal products (butter, cheese, lard, milk) at the national level.
Sources: Information on butter, cheese, lard, meat and milk: ISTAT (1950), slaughtered animals: ISTAT (1948) and ISTAT (1950).

Figure 6: **Patience Distribution by Cohort and Scarcity Levels**

(a) Treated Cohort 1942-1945

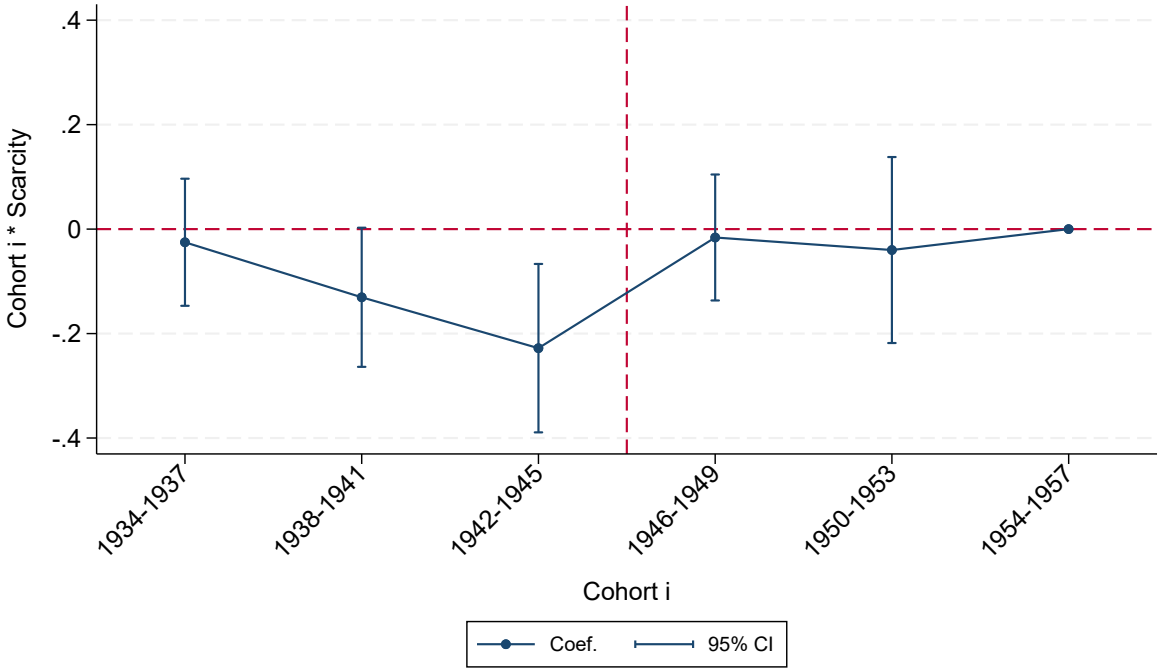


(b) Control Cohort 1946-1957



Notes: The figure shows the distribution of the ordinal variable *Patience* among individuals in the treated cohort (panel a) and the control cohort (panel b). The black and grey columns denote provinces with values of $Scarcity_p$ above and below the mean respectively. Patience levels of the household head are measured on a six-point scale from 1 ("least patient") to 6 ("most patient"). Participants indicated the fraction of a hypothetical lottery win (equal to their annual net income) they would forfeit for immediate access, with options to forfeit 20%, 10%, 5%, 3%, or 2% of the prize for immediate receipt instead of waiting a year.

Figure 7: **Effects of meat scarcity on the probability of being impatient**



Notes: Estimated coefficients of the interaction terms in the diff-in-diff specification and 95% confidence intervals. Standard errors are clustered at the provincial level. The dependent variable is a dummy equal to 1 if the individual is labeled as impatient and 0 otherwise. Treated cohorts are born in 1934-1937, 1938-1941, and 1942-1945. Control cohorts are born in 1946-1949 and 1950-1953. Omitted cohort (comparison category) is born in 1954-1957. $Scarcity_p$ is the % change in the number of slaughtered animals for meat consumption between 1941-1942 and 1945.

Tables

Table 1: **Summary Statistics**

	Mean	SD	Median	Min	Max	N
Patience	3.64	1.71	3.00	1.00	6.00	2,499
Impatient	0.10	0.30	0.00	0.00	1.00	2,499
log(Savings)	8.30	1.18	8.45	2.06	11.87	1,964
$Scarcity_p$	0.35	0.22	0.30	0.00	0.92	2,499
$Cohort_i$	0.23	0.42	0.00	0.00	1.00	2,499
War Victims$_p$	0.48	0.25	0.42	0.07	1.30	2,499
Bomb Tons$_p$	8.75	9.11	5.43	0.00	51.58	2,499
Civil Victimization$_p$	0.12	0.13	0.08	0.00	0.69	2,499
$\Delta(Fertility)_p$	-0.05	0.24	-0.09	-0.57	0.76	2,499
Female	0.32	0.47	0.00	0.00	1.00	2,499
Age	54.54	4.46	54.00	47.00	62.00	2,499
Parental High Education	0.20	0.40	0.00	0.00	1.00	2,499
High-Skilled Father	0.25	0.43	0.00	0.00	1.00	2,499
Num. Siblings	2.28	2.11	2.00	0.00	16.00	2,499
log(Net Income)	9.64	0.63	9.68	5.70	12.11	2,497
log(Wealth)	11.04	1.67	11.45	3.62	14.75	2,416
Retired	0.27	0.45	0.00	0.00	1.00	2,499
University Degree	0.10	0.31	0.00	0.00	1.00	2,499
Married	0.76	0.43	1.00	0.00	1.00	2,499
Single	0.07	0.26	0.00	0.00	1.00	2,499
Divorced	0.10	0.30	0.00	0.00	1.00	2,499
Fin. Literacy	0.66	1.05	0.00	0.00	5.00	2,499
Fin. Risk	4.34	0.96	5.00	1.00	5.00	2,499
Health Insurance	0.09	0.28	0.00	0.00	1.00	2,499
Fin. Situation	3.15	1.12	3.00	1.00	6.00	2,499

The table reports the summary statistics for the main variables used in the analysis. The definition of all variables is in Table B.V.

Table 2: **Differences in Means**

	Treated Cohort 1942-1945				Control Cohort 1946-1957			
	Scarcity High	Scarcity Low	Diff.	N	Scarcity High	Scarcity Low	Diff.	N
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Patience	3.63	3.27	0.36**	585	3.86	3.55	0.31***	1914
Impatient	0.08	0.13	-0.05*	585	0.09	0.10	-0.01	1914
log(Savings)	8.55	7.94	0.61***	479	8.53	8.10	0.44***	1485
War Victims$_p$	0.56	0.41	0.15***	585	0.56	0.40	0.16***	1914
Female	0.28	0.31	-0.02	585	0.35	0.30	0.04	1914
Age	60.35	60.49	-0.14	585	52.68	52.80	-0.12	1914
Parental High Education	0.16	0.15	0.01	585	0.26	0.17	0.08***	1914
High-Skilled Father	0.31	0.23	0.08*	585	0.25	0.23	0.01	1914
Num. Siblings	2.01	2.59	-0.58***	585	1.80	2.68	-0.88***	1914
log(Net Income)	9.81	9.50	0.31***	585	9.79	9.49	0.30***	1912
log(Wealth)	11.43	10.90	0.53***	573	11.31	10.71	0.60***	1843
Retired	0.65	0.59	0.06	585	0.17	0.17	-0.00	1914
University Degree	0.09	0.06	0.03	585	0.13	0.10	0.03	1914
Married	0.75	0.73	0.02	585	0.74	0.79	-0.05*	1914
Single	0.06	0.07	-0.01	585	0.09	0.07	0.02	1914
Divorced	0.09	0.07	0.02	585	0.12	0.09	0.03*	1914
Fin. Literacy	0.85	0.68	0.17	585	0.75	0.53	0.22***	1914
Fin. Risk	4.14	4.42	-0.27***	585	4.22	4.47	-0.25***	1914
Health Insurance	0.11	0.07	0.05	585	0.10	0.07	0.03*	1914
Fin. Situation	3.39	2.96	0.42***	585	3.37	2.94	0.43***	1914
War Victims$_p$	0.56	0.41	0.15***	585	0.56	0.40	0.16***	1914
Bomb Tons$_p$	11.22	5.82	5.39***	585	12.06	5.96	6.11***	1914
Civil Victimization$_p$	0.16	0.09	0.07***	585	0.16	0.09	0.07***	1914
$\Delta(Fertility)_p$	-0.12	0.00	-0.12***	585	-0.13	0.02	-0.15***	1914

The table reports differences in means for the main variable of the analysis between treated (born in 1942-1945) and control (born in 1946-1957) cohorts. Scarcity High and Scarcity Low respectively identify provinces with values of $Scarcity_p$ above and below the mean. Standard errors are clustered at the province of birth level. The definition of all variables is in Table B.V. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table 3: **Effect of Meat Scarcity on Impatience**

Dependent variable:	Prob(Impatient)		
	(1)	(2)	(3)
$Cohort_i \times Scarcity_p$	-0.204***	-0.233***	-0.245***
	(0.072)	(0.067)	(0.068)
$Scarcity_p$	0.019	0.052	0.067
	(0.043)	(0.046)	(0.046)
$Cohort_i$	0.074**	0.184***	0.187***
	(0.037)	(0.051)	(0.046)
Female		0.008	-0.025
		(0.019)	(0.021)
Age		0.147**	0.154***
		(0.058)	(0.049)
Age^2		-0.001**	-0.001***
		(0.001)	(0.000)
Parental High Education		-0.041***	-0.034**
		(0.013)	(0.016)
High-Skilled Father		-0.041***	-0.031**
		(0.013)	(0.013)
Num. Siblings		0.004	0.002
		(0.005)	(0.004)
War Victims_p		0.008	0.006
		(0.042)	(0.042)
$\Delta(Fertility)_p$		-0.014	-0.063
		(0.086)	(0.081)
Bomb Tons_p		0.001	0.001
		(0.001)	(0.001)
$\text{Civil Victimization}_p$		-0.157	-0.115
		(0.096)	(0.088)
log(Net Income)			-0.066***
			(0.020)
log(Wealth)			-0.001
			(0.006)
Retired			0.007
			(0.016)
University Degree			0.022
			(0.020)
Married			-0.069*
			(0.038)
Single			-0.004
			(0.049)
Divorced			-0.038
			(0.045)
Province FE	Yes	Yes	Yes
Observations	2,498	2,498	2,414
Adjusted R-squared	0.056	0.069	0.086
Mean dep. var.	0.097	0.097	0.091
Number of provinces	102	102	102

The table reports Linear Probability Model estimates of meat scarcity during childhood on the probability of being impatient during late adulthood. $Cohort_i$ is a dummy equal to 1 if born in 1942-1945 and 0 if born in 1946-1957. $Scarcity_p$ is the % change in the number of animals slaughtered for meat between the 1941-42 average and that of 1945 in each province in absolute terms. Col (1) reports the DiD coefficients without controls; Col. (2) is the baseline and it includes only exogenous controls (demographics and socioeconomic characteristics of the family origin), the change in fertility rate between the 1941-42 average and that of 1945, as well as the per capita casualties, the amount of bombs (tons) dropped and the number of incidents of civilian victimization events during WWII at the provincial level, Col. (3) also includes additional controls: households' log(Net Income), log(Wealth), educational attainment, retirement status, and marital status. Standard errors are clustered at the province of birth level. The definition of all variables is in Table B.V. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table 4: **Effect of Meat Scarcity on Impatience: War-related Confounding Factors**

Dependent variable:	Prob(Impatient)					
	Full Sample			Conf. Factor$_p$ < $p(50)$		
	War Casualties	War Bombs	Civil Victimization	Low War Casualties	Low War Bombs	Low Civil Victimization
	(1)	(2)	(3)	(4)	(5)	(6)
$Cohort_i \times Scarcity_p$	-0.237***	-0.240***	-0.218***	-0.198*	-0.232*	-0.212***
	(0.077)	(0.074)	(0.060)	(0.104)	(0.121)	(0.079)
$Scarcity_p$	0.051	0.041	0.059	-0.024	-0.107	0.048
	(0.044)	(0.043)	(0.039)	(0.077)	(0.083)	(0.052)
$Cohort_i \times$ Conf. Factor$_p$	0.013	0.001	-0.099			
	(0.059)	(0.002)	(0.093)			
Conf. Factor$_p$	-0.017	0.001	-0.131*			
	(0.036)	(0.001)	(0.076)			
$Cohort_i$	0.178***	0.181***	0.190***	0.151**	0.165***	0.251***
	(0.049)	(0.050)	(0.052)	(0.059)	(0.053)	(0.065)
Province FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,498	2,498	2,498	1,216	1,225	1,391
Adjusted R-squared	0.068	0.068	0.069	0.104	0.074	0.089
Mean dep. var.	0.097	0.097	0.097	0.096	0.087	0.109
Number of provinces	102	102	102	51	48	49

The table reports Linear Probability Model estimates of meat scarcity during childhood on the probability of being impatient during late adulthood controlling for the effect of WWII-related confounding factors. $Cohort_i$ is a dummy equal to 1 if born in 1942-1945 and 0 if born in 1946-1957. $Scarcity_p$ is the % change in the number of animals slaughtered for meat between the 1941-42 average and that of 1945 in each province in absolute terms. In Col (1) *Conf. Factor*$_p$ is the number of casualties during WWII per 1000 population at the province level. In Col. (2) *Conf. Factor*$_p$ is the amount of bombs (tons) dropped during WWII per 1000 population at the province level. In Col. (3) *Conf. Factor*$_p$ is the number of incidents of civilian victimization events during WWII per 1000 population at the province level. Col. (4) excludes individuals born in provinces that experienced a high number (above the median) of war casualties per capita. Col. (5) excludes individuals born in provinces in which a high number (above the median, in tons) of bombs dropped. Col. (6) excludes individuals born in provinces with a high number (above the median) of civilian victimization events. Standard errors are clustered at the province of birth level. The definition of all variables is in Table B.V. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table 5: **Effect of Meat Scarcity on Impatience: Robustness**

Dependent variable:	Prob(Impatient)								
	Additional controls			Shock definition				Account for trade	
	Recovery	Exclude 46-47	Extd. Controls	Discrete Treatment	Scarcity per capita	$\Delta(Weight)$	$\Delta(Census)$	Not Meat Intensive	Regional Treatment
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$Cohort_i \times Scarcity_p$	-0.233***	-0.224***	-0.218***	-0.101***	-0.863**	-0.183***	-0.214***	-0.261***	-0.197**
	(0.067)	(0.063)	(0.073)	(0.032)	(0.362)	(0.064)	(0.077)	(0.086)	(0.082)
$Scarcity_p$	0.048	0.035	0.089	0.032*	0.260	0.048	0.044	0.039	0.065
	(0.069)	(0.081)	(0.056)	(0.018)	(0.465)	(0.038)	(0.042)	(0.053)	(0.053)
$Cohort_i$	0.184***	0.151**	0.184***	0.144***	0.114***	0.151***	0.173***	0.195***	0.172***
	(0.051)	(0.060)	(0.046)	(0.042)	(0.040)	(0.047)	(0.051)	(0.055)	(0.057)
Recovery	-0.003	-0.009	0.024						
	(0.035)	(0.039)	(0.030)						
Province FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE	No	No	Yes	No	No	No	No	No	No
Observations	2,498	2,142	2,414	2,498	2,498	2,498	2,498	2,264	2,498
Adjusted R-squared	0.068	0.059	0.101	0.068	0.064	0.067	0.066	0.074	0.066
Mean dep. var.	0.097	0.100	0.091	0.097	0.097	0.097	0.097	0.096	0.097
Number of provinces	102	102	102	102	102	102	102	97	102

The table reports Linear Probability Model estimates of meat scarcity during childhood on the probability of being impatient during late adulthood. $Cohort_i$ is a dummy equal to 1 if born in 1942-1945 and 0 if born in 1946-1957. $Scarcity_p$ is the continuous treatment variable and represents the % change in the number of animals slaughtered for meat between the 1941-42 average and that of 1945 in each province in absolute terms. Col. (1) reports the estimation results of eq. 1 controlling for any differences across provinces in the speed of recovery of the number of slaughtered animals for meat after WWII. Col. (2) excludes individuals born in 1946 and 1947 from the control group. Col. (3) additionally controls for financial literacy, risk aversion, financial situation, employment-sector dummies, change in the fertility rate and war-related confounding factors (war casualties, bombing (tons), and civilian victimization) interacted with the $Cohort_i$ dummy. Col. (4) uses a discretized version of the main treatment, i.e., a dummy equal to 1 for provinces with $Scarcity_p$ values above the sample median and 0 otherwise. Col. (5) redefines the treatment using $Scarcity\ per\ capita_p$, i.e., $Scarcity_p$ divided by the 1936 population level. Col (6) redefines the treatment using $\Delta(Weight)_p$, i.e., the % change in the weight of slaughtered meat between the 1941-42 average and that of 1945 in each province in absolute terms. Col. (7) redefines the treatment using $\Delta(Census)_p$: the % change in the number of breed animals between 1941-42 and 1944 in each Central-Southern region and the % change in the number of animals slaughtered for meat between 1941-42 and 1945 in each Northern region. Col. (8) excludes individuals born in provinces with a very high number (above the 90th percentile) of slaughtered animals for meat in 1941-42, Col. (9) redefines the main treatment variable at the regional level. Standard errors are clustered at the province of birth level. The definition of all variables is in Table B.V. The list of controls is in Table 3, column 2. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table 6: **Effect of Meat Scarcity on Impatience: Heterogeneity**

Dependent variable:	Prob(Impatient)									
	Low Parental Education (1)	High Parental Education (2)	Male (3)	Female (4)	Male Siblings (5)	Female Siblings (6)	Low Infant Mortality (7)	High Infant Mortality (8)	Fish Catch (9)	No Fish Catch (10)
$Cohort_i \times Scarcity_p$	-0.269***	-0.124	-0.224***	-0.182**	-0.245***	-0.133*	-0.234*	-0.242**	-0.214**	-0.187*
	(0.075)	(0.098)	(0.076)	(0.080)	(0.083)	(0.076)	(0.126)	(0.094)	(0.088)	(0.104)
$Scarcity_p$	0.054	0.144*	0.063	0.105	0.060	-0.005	0.030	0.092	0.153*	0.007
	(0.049)	(0.076)	(0.057)	(0.071)	(0.057)	(0.059)	(0.123)	(0.056)	(0.089)	(0.057)
$Cohort_i$	0.208***	0.096	0.175***	0.067	0.182***	0.156***	0.136**	0.214***	0.223**	0.094*
	(0.054)	(0.085)	(0.063)	(0.074)	(0.049)	(0.053)	(0.058)	(0.078)	(0.083)	(0.054)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2001	478	1708	777	1535	1554	1243	1231	999	1470
Adjusted R-squared	0.061	0.092	0.079	0.092	0.050	0.077	0.102	0.053	0.067	0.069
Mean dep. var.	0.107	0.056	0.092	0.107	0.099	0.093	0.092	0.101	0.104	0.092
Number of provinces	101	92	102	94	101	101	58	44	27	75

The table reports Linear Probability Model estimates of meat scarcity during childhood on the probability of being impatient during late adulthood. $Cohort_i$ is a dummy equal to 1 if born in 1942-1945 and 0 if born in 1946-1957. $Scarcity_p$ is the % change in the number of animals slaughtered for meat between the 1941-42 average and that of 1945 in each province in absolute terms. Col. (1) includes only individuals with low parental education (i.e., both parents with an elementary school degree or no degree), Col. (2) contains only individuals with high parental education (at least one parent with a middle school certificate or a higher degree), Col. (3) includes only male individuals, Col. (4) contains only female individuals, Col. (5) includes only individuals with at least one brother, Col. (6) contains only individuals with at least one sister, Col. (7) includes only individuals born in provinces that witnessed a low (below the sample median) increase in infant mortality rate between 1940 and 1945. Col. (8) contains only individuals born in provinces that witnessed a high (above the sample median) increase in infant mortality rate between 1940 and 1945, Col. (9) includes only individuals born in provinces with reported fish catch in 1936, Col. (10) includes only individuals born in provinces without any reported fish catch in 1936. Standard errors are clustered at the province of birth level. The definition of all variables is in Table B.V. The list of controls is in Table 3, column 2. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table 7: **Effect of Food Scarcity on Impatience: Food categories**

Dependent variable:	Prob(Impatient)						
	Proteins		Carbohydrates			Fruits	
	Meat	Legumes	Wheat	Corn	Potato	Tomato	Apple
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$Cohort_i \times Scarcity_p$	-0.233***	-0.115*	0.007	-0.008	0.002	-0.024	-0.012
	(0.067)	(0.066)	(0.064)	(0.060)	(0.043)	(0.037)	(0.011)
$Scarcity_p$	0.052	0.065*	0.048	0.057*	0.036	0.047**	-0.002
	(0.046)	(0.033)	(0.036)	(0.031)	(0.037)	(0.019)	(0.007)
$Cohort_i$	0.184***	0.155**	0.091*	0.098**	0.092***	0.099***	0.071*
	(0.051)	(0.059)	(0.048)	(0.047)	(0.034)	(0.037)	(0.036)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,498	2,169	2,369	2,356	2,435	2,456	2,360
Adjusted R-squared	0.069	0.081	0.064	0.064	0.063	0.067	0.065
Mean dep. var.	0.097	0.089	0.100	0.100	0.099	0.097	0.095
Number of provinces	102	92	98	97	99	99	99

The table reports Linear Probability Model estimates of meat scarcity during childhood on the probability of being impatient during late adulthood. $Cohort_i$ is a dummy equal to 1 if born in 1942-1945 and 0 if born in 1946-1957. In Col. (1) $Scarcity_p$ is the % change in the number of animals slaughtered for meat between the 1941-42 average and that of 1945 in each province in absolute terms. In Col. (2), $Scarcity_p$ is the % change in legumes (beans and chickpeas) production between the 1941-42 average and that of 1945 in each province in absolute terms. In Col. (3), $Scarcity_p$ is the % change in wheat production between the 1941-42 average and that of 1945 in each province in absolute terms. In Col. (4), $Scarcity_p$ is the % change in corn production between the 1941-42 average and that of 1945 in each province in absolute terms. In Col. (5), $Scarcity_p$ is the % change in potato production between the 1941-42 average and that of 1945 in each province in absolute terms. In Col. (6), $Scarcity_p$ is the % change in tomato production between the 1941-42 average and that of 1945 in each province in absolute terms. In Col. (7), $Scarcity_p$ is the % change in apple production between the 1941-42 average and that of 1945 in each province in absolute terms. Standard errors are clustered at the province of birth level. The definition of all variables is in Table B.V. The list of controls is in Table 3, column 2. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table 8: **Effect of Patience on Savings**

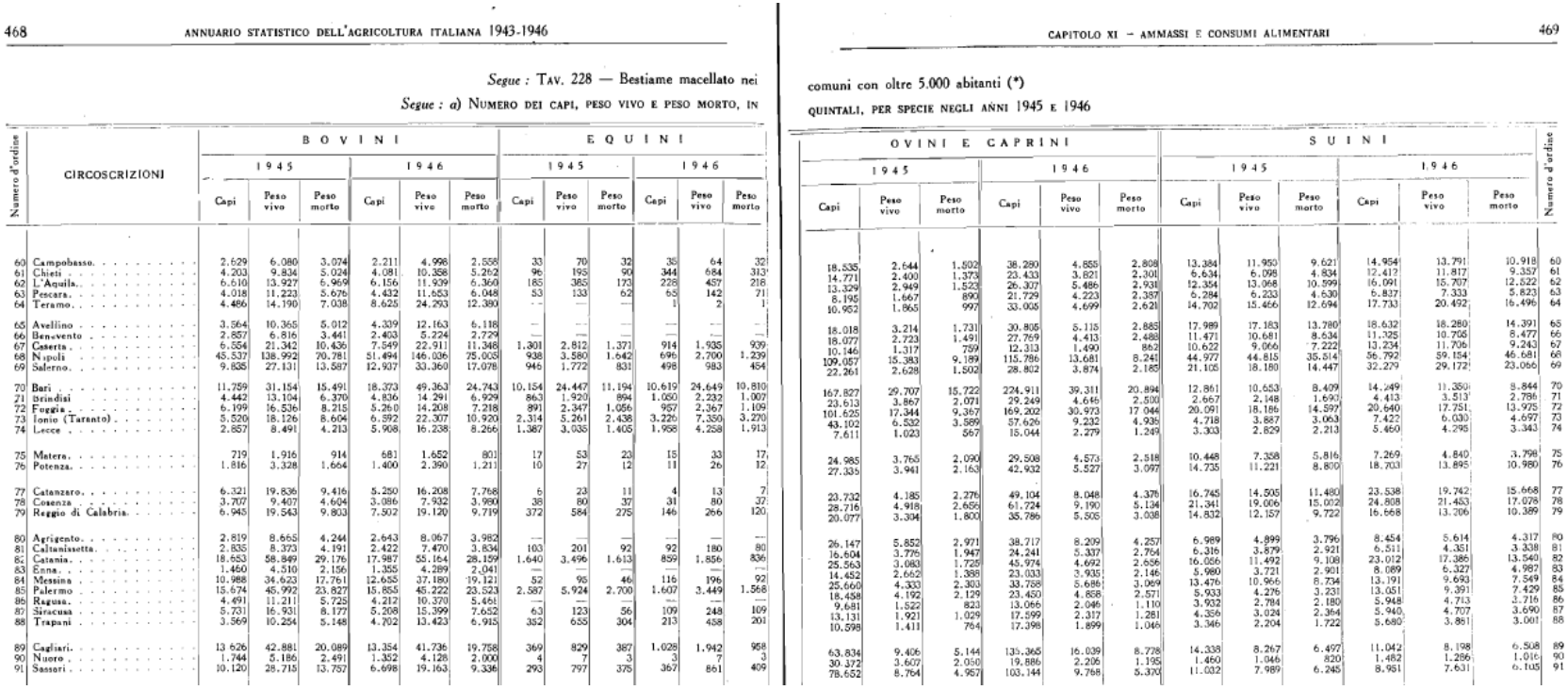
Dependent variable:	$log(Savings)$			
	Reduced Form		2SLS	
	(1)	(2)	(3)	(4)
$Cohort_i \times Scarcity_p$	0.611*	0.607*		
	(0.321)	(0.307)		
Impatient			-2.230*	-2.270*
			(1.247)	(1.152)
$Scarcity_p$	-0.095	-0.004	0.046	0.225
	(0.179)	(0.259)	(0.170)	(0.274)
$Cohort_i$	-0.310	-0.305	0.064	0.058
	(0.203)	(0.195)	(0.139)	(0.128)
Female	-0.104*	-0.052	-0.083	-0.088
	(0.058)	(0.062)	(0.065)	(0.090)
Age	-0.048	-0.117	0.194	0.137
	(0.203)	(0.184)	(0.241)	(0.228)
Age^2	0.000	0.001	-0.002	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)
Parental High Education	-0.174***	-0.143**	-0.245***	-0.215**
	(0.057)	(0.060)	(0.090)	(0.088)
High-Skilled Father	0.002	0.025	-0.061	-0.036
	(0.050)	(0.048)	(0.082)	(0.074)
Num. Siblings	-0.004	-0.012	-0.007	-0.009
	(0.011)	(0.010)	(0.013)	(0.012)
War Victims_p	-0.072	-0.093	0.006	-0.083
	(0.181)	(0.182)	(0.159)	(0.172)
$\Delta(Fertility)_p$	-0.429*	-0.437*	-0.469	-0.554
	(0.229)	(0.245)	(0.358)	(0.358)
Bomb Tons_p	0.002	0.001	0.005	0.004
	(0.003)	(0.003)	(0.005)	(0.005)
$\text{Civil Victimization}_p$	-0.399	-0.362	-0.731	-0.563
	(0.450)	(0.440)	(0.469)	(0.403)
log(Net Income)	1.600***	1.750***	1.481***	1.675***
	(0.080)	(0.088)	(0.122)	(0.108)
log(Wealth)		-0.059**		-0.032
		(0.024)		(0.029)
Retired		-0.129**		-0.093
		(0.060)		(0.078)
University Degree		-0.088		-0.016
		(0.085)		(0.116)
Married		0.155		0.029
		(0.119)		(0.180)
Single		-0.031		-0.194
		(0.136)		(0.204)
Divorced		-0.210		-0.264
		(0.150)		(0.217)
Recovery		0.063		0.145
		(0.128)		(0.140)
Fin. Literacy		-0.009		-0.008
		(0.028)		(0.032)
Fin. Risk		-0.019		-0.006
		(0.029)		(0.036)
Health Insurance		-0.076		-0.064
		(0.076)		(0.091)
Fin. Situation		-0.016		-0.106
		(0.034)		(0.072)
Province FE	Yes	Yes	Yes	Yes
Observations	1,960	1,921	1,960	1,921
Adjusted R-squared	0.563	0.571	0.178	0.188
Mean dep. var.	8.297	8.316	8.297	8.316
Number of provinces	102	102	102	102
First-Stage F-stat.			12.690	15.982

The table contains the second-stage results of equation 2 and the results of the reduced form. The main dependent variable is the natural logarithm of the reported yearly household savings, $log(Savings)$. Cols. (1) and (2) report the reduced form regression with two different sets of control variables. Cols. (3) and (4) report the 2SLS estimates with two different sets of control variables. Standard errors are clustered at the province of birth level. The definition of all variables is in Table B.V. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Online Appendix for Early Life Conditions, Time Preferences, and Savings

Online Appendix A

Figure A.1: **An extract of the Annual Agricultural Statistics 1943-1946**



468 ANNUARIO STATISTICO DELL'AGRICOLTURA ITALIANA 1943-1946

Segue : TAV. 228 — Bestiame macellato nei

Segue : a) NUMERO DEI CAPI, PESO VIVO E PESO MORTO, IN

Numero d'ordine	CIRCOSCRIZIONI	BOVINI 1945 Capi	BOVINI 1945 Peso vivo	BOVINI 1945 Peso morto	BOVINI 1946 Capi	BOVINI 1946 Peso vivo	BOVINI 1946 Peso morto	EQUINI 1945 Capi	EQUINI 1945 Peso vivo	EQUINI 1945 Peso morto	EQUINI 1946 Capi	EQUINI 1946 Peso vivo	EQUINI 1946 Peso morto
60	Campobasso	2.629	6.080	3.074	2.211	4.998	2.558	33	70	32	38	64	32
61	Chieti	4.203	9.834	5.024	4.081	10.358	5.262	96	193	90	344	684	313
62	L'Aquila	6.610	13.927	6.969	6.156	11.939	6.369	185	383	173	228	457	216
63	Pescara	4.018	11.223	5.676	4.432	11.553	6.048	53	133	62	68	142	71
64	Teramo	4.486	14.190	7.038	8.625	24.293	12.380	—	—	—	1	2	1
65	Avellino	3.564	10.365	5.012	4.339	12.163	6.118	—	—	—	—	—	—
66	Benevento	2.857	6.816	3.441	2.403	5.224	2.729	—	—	—	—	—	—
67	Caserta	6.554	21.342	10.436	7.549	22.911	11.348	1.301	2.812	1.371	914	1.935	939
68	Napoli	45.537	138.992	70.781	51.494	146.036	75.005	938	3.580	1.642	696	2.700	1.239
69	Salerno	9.838	27.131	13.587	12.907	33.360	17.078	946	1.772	831	498	983	454
70	Bari	11.759	31.154	15.491	18.373	49.363	24.743	10.154	24.447	11.194	10.619	24.649	10.810
71	Brindisi	4.442	13.104	6.370	4.836	14.291	6.929	863	1.920	894	1.050	2.232	1.007
72	Foggia	6.199	16.536	8.215	5.260	14.208	7.218	891	2.347	1.056	957	2.367	1.109
73	Ionio (Taranto)	5.520	18.126	8.604	6.592	22.307	10.920	2.314	5.261	2.438	3.226	7.350	3.270
74	Lecce	2.857	8.491	4.213	5.908	16.238	8.266	1.387	3.038	1.405	1.958	4.258	1.913
75	Matera	219	1.916	914	681	1.652	801	17	53	23	15	33	17
76	Potenza	1.816	3.328	1.664	1.400	2.390	1.211	10	27	12	11	26	12
77	Catanzaro	6.321	19.836	9.416	5.250	16.208	7.768	6	23	11	4	13	7
78	Cosenza	3.707	9.407	4.604	3.086	7.932	3.960	38	80	37	31	80	37
79	Reggio di Calabria	6.945	19.543	9.803	7.502	19.120	9.719	372	584	275	146	266	120
80	Agrigento	2.819	8.665	4.244	2.643	8.067	3.982	—	—	—	—	—	—
81	Caltanissetta	2.835	8.373	4.191	2.422	7.470	3.834	103	201	92	92	180	80
82	Catania	18.553	58.849	29.176	17.987	55.164	28.159	1.640	3.496	1.613	859	1.856	836
83	Enna	1.460	4.510	2.156	1.355	4.289	2.041	—	—	—	—	—	—
84	Messina	10.988	34.623	17.761	12.655	37.180	19.121	52	98	46	116	196	92
85	Palermo	15.674	45.992	23.827	15.855	45.222	23.523	2.587	5.924	2.700	1.607	3.449	1.568
86	Ragusa	4.491	11.211	5.725	4.212	10.370	5.461	—	—	—	—	—	—
87	Siracusa	5.731	16.931	8.177	5.208	15.399	7.652	63	123	56	109	248	109
88	Trapani	3.569	10.254	5.148	4.702	13.423	6.915	352	655	304	213	458	201
89	Cagliari	13.626	42.881	20.089	13.354	41.736	19.758	369	829	387	1.028	1.942	958
90	Nuoro	1.744	5.186	2.491	1.352	4.128	2.000	4	7	3	3	7	3
91	Sassari	10.120	28.715	13.757	6.698	19.163	9.336	293	797	378	367	861	409

CAPITOLO XI — AMMASSI E CONSUMI ALIMENTARI 469

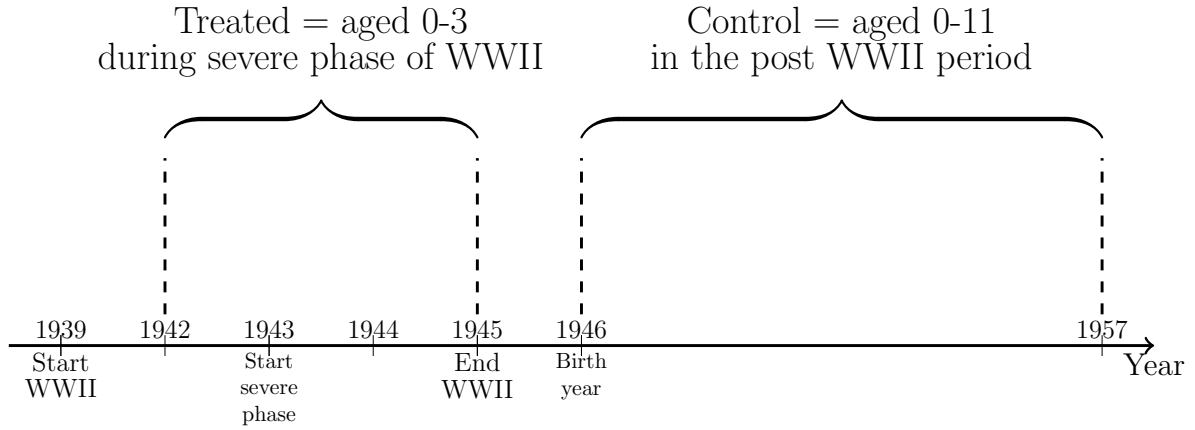
comuni con oltre 5.000 abitanti (*)

QUINTALI, PER SPECIE NEGLI ANNI 1945 E 1946

OVINI E CAPRINI 1945 Capi	OVINI E CAPRINI 1945 Peso vivo	OVINI E CAPRINI 1945 Peso morto	OVINI E CAPRINI 1946 Capi	OVINI E CAPRINI 1946 Peso vivo	OVINI E CAPRINI 1946 Peso morto	SUINI 1945 Capi	SUINI 1945 Peso vivo	SUINI 1945 Peso morto	SUINI 1946 Capi	SUINI 1946 Peso vivo	SUINI 1946 Peso morto	Numero d'ordine
18.535	2.644	1.502	38.280	4.855	2.808	13.384	11.950	9.621	14.954	13.791	10.918	60
14.771	2.400	1.373	23.433	3.821	2.301	6.634	6.098	4.834	12.417	11.817	9.357	61
13.329	2.949	1.523	26.307	5.486	2.931	12.354	13.068	10.599	16.091	15.707	12.522	62
8.195	1.667	890	21.729	4.223	2.387	6.294	6.233	4.630	6.837	7.333	5.823	63
10.952	1.865	997	33.005	4.699	2.621	14.702	15.466	12.694	17.733	20.492	16.496	64
18.018	3.214	1.731	30.805	5.115	2.885	17.989	17.183	13.780	18.632	18.280	14.391	65
18.077	2.723	1.491	27.769	4.413	2.488	11.471	10.681	8.534	11.325	10.705	8.477	66
10.146	1.317	759	12.313	1.490	862	10.622	9.066	7.222	13.234	11.706	9.243	67
109.057	15.393	9.189	115.786	13.681	8.241	44.977	44.815	35.514	56.792	59.154	46.681	68
22.261	2.628	1.502	28.802	3.874	2.185	21.105	18.180	14.447	32.229	29.172	23.066	69
167.827	29.707	15.722	224.911	39.311	20.894	12.861	10.653	8.409	14.249	11.350	8.844	70
23.613	3.867	2.071	29.249	4.646	2.500	2.667	2.148	1.690	4.413	3.513	2.786	71
101.625	17.344	9.367	169.202	30.973	17.044	20.091	18.186	14.597	20.640	17.751	13.975	72
43.102	6.532	3.589	57.626	9.232	4.935	4.718	3.887	3.063	7.422	6.030	4.697	73
7.611	1.023	567	15.044	2.279	1.249	3.303	2.829	2.213	5.460	4.295	3.343	74
24.985	3.765	2.090	29.508	4.573	2.518	10.448	7.358	5.816	7.269	4.840	3.798	75
27.335	3.941	2.163	42.932	5.527	3.097	14.735	11.221	8.800	18.703	13.895	10.980	76
23.732	4.185	2.276	49.104	8.048	4.378	16.745	14.505	11.480	23.538	19.742	15.668	77
28.716	4.918	2.656	61.724	9.190	5.134	21.341	19.006	15.002	24.808	21.483	17.078	78
20.077	3.304	1.800	35.786	5.505	3.038	14.832	12.157	9.722	16.668	13.206	10.389	79
26.147	5.852	2.971	38.717	8.209	4.257	6.989	4.899	3.796	8.454	5.614	4.317	80
16.604	3.776	1.947	24.241	5.337	2.764	6.316	3.879	2.921	6.511	4.351	3.338	81
25.563	3.083	1.725	45.974	4.692	2.656	16.086	11.492	9.108	23.012	17.386	13.540	82
14.452	2.662	1.388	23.033	3.935	2.146	5.980	3.721	2.901	8.089	6.327	4.987	83
25.660	4.333	2.303	33.788	5.686	3.069	13.476	10.966	8.734	13.191	9.693	7.549	84
18.458	4.192	2.129	23.450	4.858	2.571	5.933	4.276	3.231	13.051	9.391	7.429	85
9.681	1.522	823	13.066	2.046	1.110	3.932	2.784	2.180	5.948	4.713	3.716	86
13.131	1.921	1.029	17.599	2.317	1.281	4.356	3.024	2.364	5.940	4.707	3.690	87
10.598	1.411	764	17.398	1.899	1.046	3.346	2.204	1.722	5.680	3.881	3.001	88
63.834	9.406	5.144	135.365	16.039	8.778	14.338	8.267	6.497	11.042	8.198	6.508	89
30.372	3.607	2.050	19.886	2.206	1.195	1.460	1.046	820	1.482	1.286	1.016	90
78.652	8.764	4.957	103.144	9.768	5.370	11.032	7.989	6.245	8.951	7.631	6.105	91

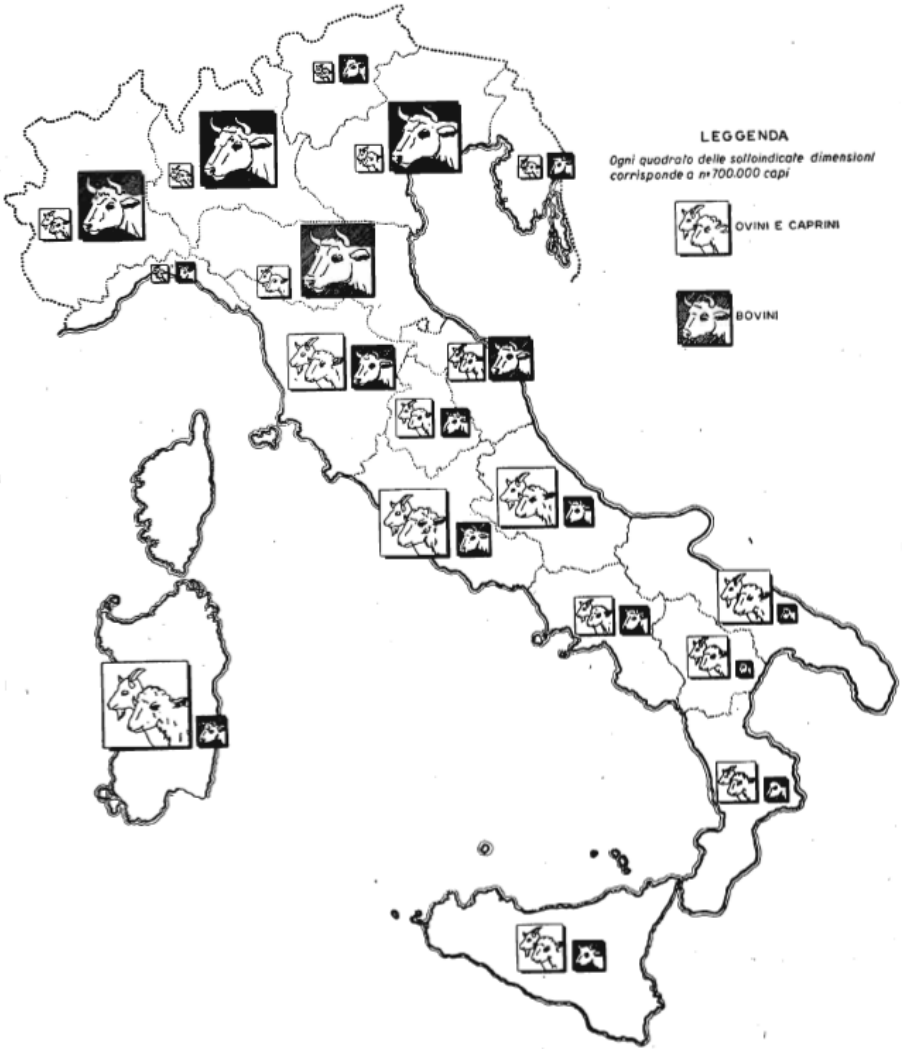
Notes: An extract of the 1943-1946 number of livestock slaughtered for meat that we digitized. We consider the sum of cattle, pigs, goats and sheep to measure the availability of meat in each province region.
Source: Statistical Summary of the Italian Regions, ISTAT (1947).

Figure A.2: **Timeline-definition of treated and control groups**



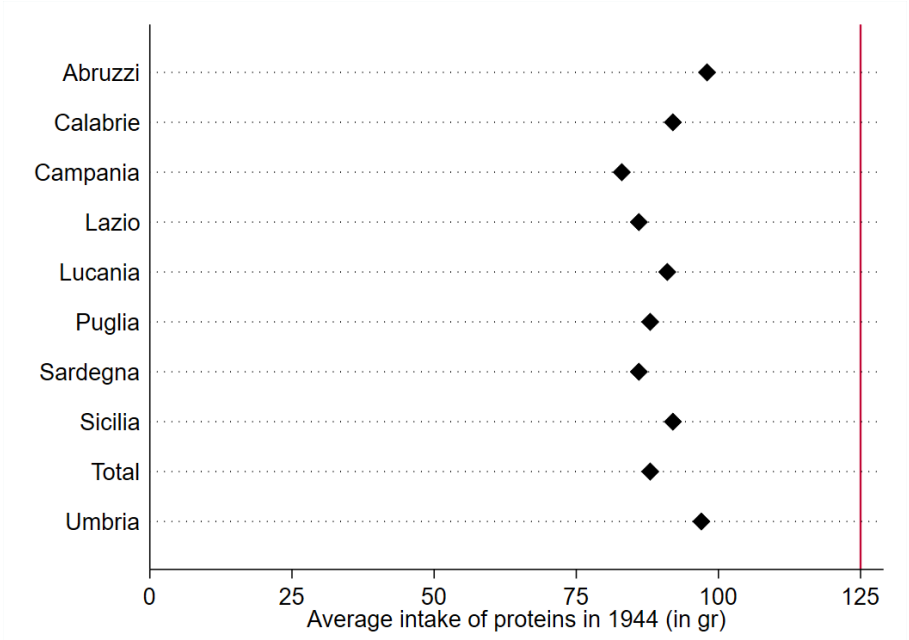
Notes: The figure shows the cohorts that constitute the treated (born 1942-1945) and the control groups (born 1946-1957)

Figure A.3: **Distribution of livestock across the Italian territory in 1942**



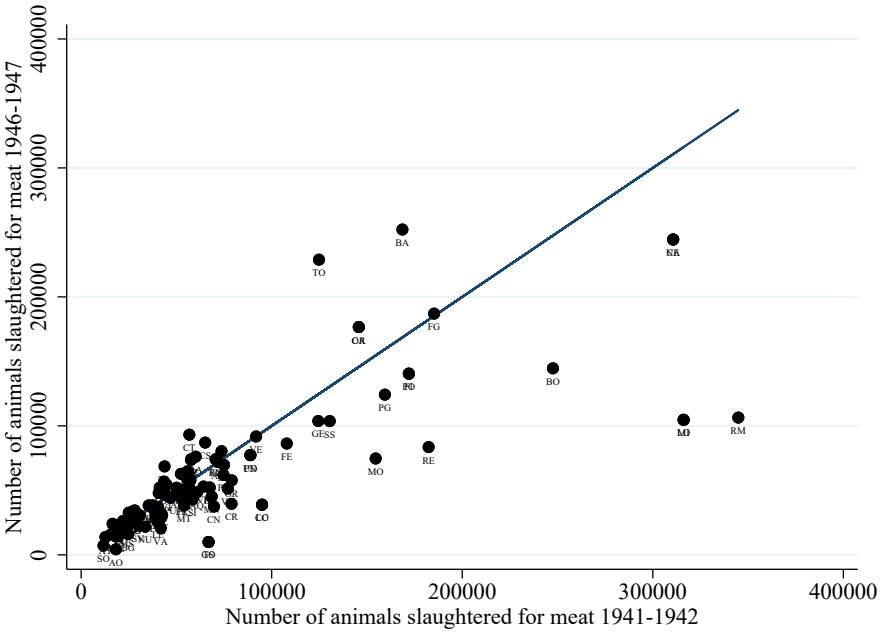
Notes: The figure shows that livestock (and thus meat consumption) was widespread all over the Italian territory. Cattle was more common in the North while goats and sheep were more common in the Center-South.
Source: Statistical Summary of the Italian Regions, ISTAT (1947).

Figure A.4: **Average daily protein intake and minimum requirements for heavy labor in 1944**



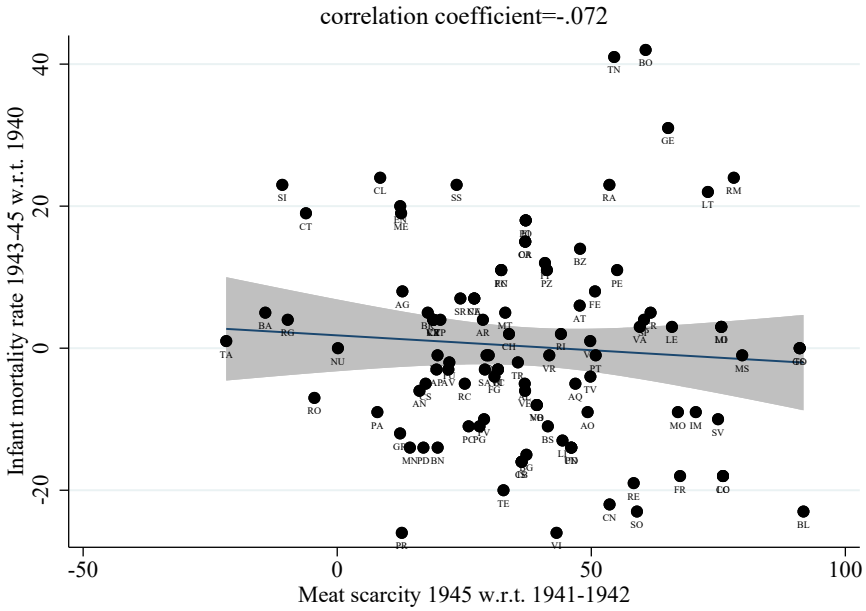
Notes: The figure shows the average daily protein intake in a set of regions with available data (liberated territory) in 1944. The red vertical line represents the minimum requirement for a person who does heavy muscular work. The average daily intake was between 20 and 35% lower than the minimum requirement.
Sources: Census and Surveys for the National Reconstruction, Survey on Living Conditions-Nutrition, p. 137-142, ISTAT (1945).

Figure A.5: **Recovery of number of slaughtered animals for meat after the end of WWII**



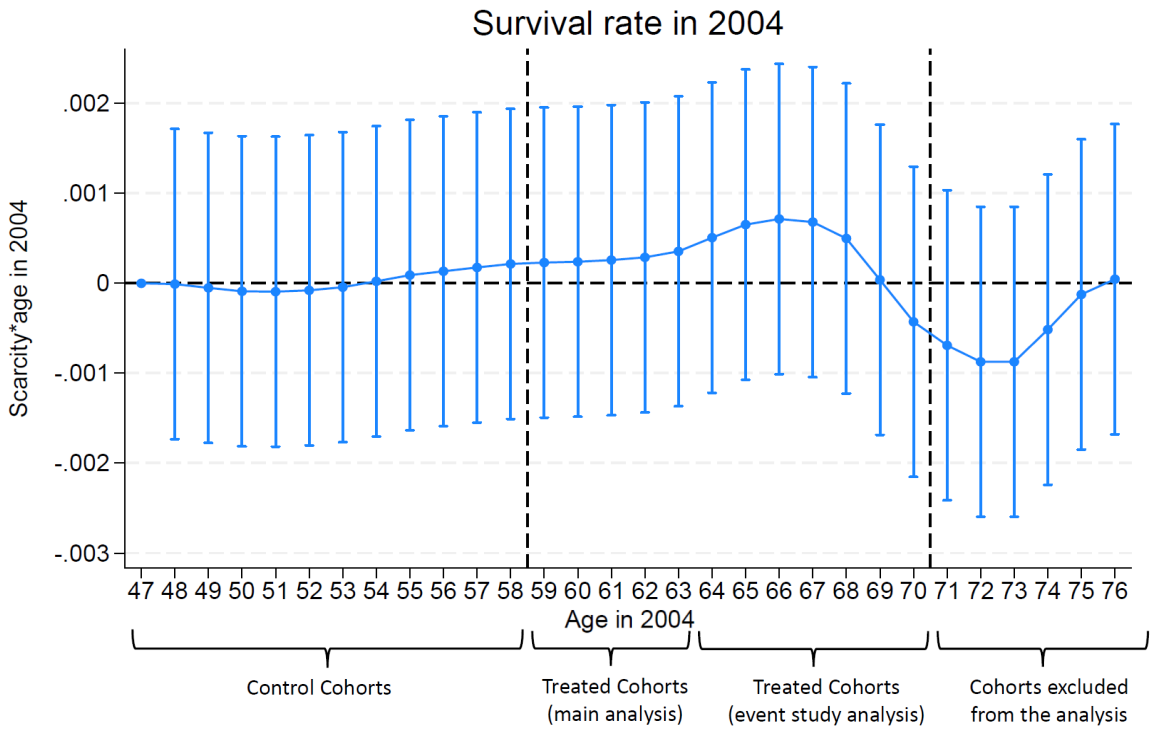
Notes: The figure shows that the number of slaughtered animals for meat in 1946-1947 had recovered to its 1941-1942 "Steady State" in most provinces.
Source: Annual Agricultural Statistics, ISTAT (1948, 1950)

Figure A.6: **Correlation between meat scarcity and infant mortality at the provincial level**



Notes: The figure shows that infant mortality during WWII was not significantly correlated with meat scarcity at the provincial level.
Source: Supplemento straordinario alla Gazzetta Ufficiale n. 63 del 15 marzo 1948.

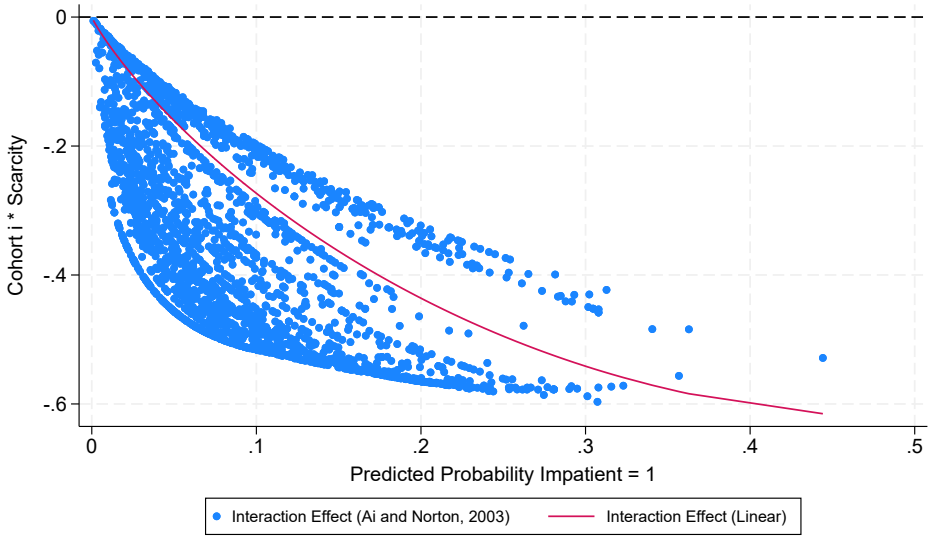
Figure A.7: **Survival bias among control cohorts, treated cohorts and among cohorts excluded from the analysis**



Notes: The figure shows that there are no survival biases among interviewed household heads due to meat scarcity.
Sources: Own elaborations on census records from https://demo.istat.it/app/?i=TVM&l=it.

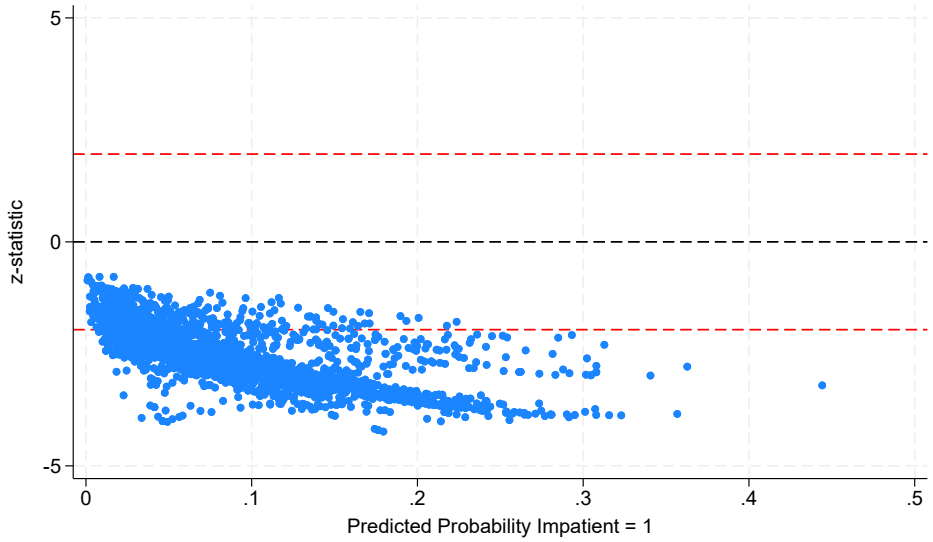
Figure A.8: **Probit - DiD Interaction Effect**

(a) DiD Interaction Effect



‘

(b) Z-stats



Notes: The figure reports the marginal effect of our DiD interaction term, $Cohort_i \times Scarcity_p$, in a Probit model estimated according to Ai and Norton (2003). Panel (a) plots the marginal effect as a function of the predicted probability. Panel (b) displays the related Z-statistics as a function of the predicted probability. The red dotted lines indicate the critical values of ± 1.96, representing the conventional 5% significance threshold for a two-tailed test.

Online Appendix B

Table B.I: **Effects of Meat Scarcity: Additional Robustness**

Dependent variable:	Prob(Impatient)					Patience
	Benchmark	Broader Definition of Impatient	Exclude Least Patient	Exclude Most Patient	Probit	OLS
	(1)	(2)	(3)	(4)	(5)	(6)
$Cohort_i \times Scarcity_p$	-0.233***	-0.398***	-0.261**	-0.271***	-0.264***	1.335***
	(0.067)	(0.138)	(0.126)	(0.078)	(0.064)	(0.388)
$Scarcity_p$	0.052	0.099	0.067	0.051	0.055	-0.322
	(0.046)	(0.086)	(0.086)	(0.065)	(0.053)	(0.311)
$Cohort_i$	0.184***	0.237***	0.131**	0.226***	0.207***	-0.730***
	(0.051)	(0.076)	(0.062)	(0.062)	(0.040)	(0.249)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,498	2,498	2,256	1,822	2,065	2,498
Adjusted R-squared	0.069	0.140	0.122	0.087		0.110
Mean dep. var.	0.097	0.277	0.199	0.133	0.117	3.642
Number of provinces	102	102	102	101	101	102

The table reports the estimated coefficients of the effect of meat scarcity during childhood on individuals' reported patience. $Cohort_i$ is a dummy equal to 1 if born in 1942-1945 and 0 if born in 1946-1957. $Scarcity_p$ is the % change in the number of animals slaughtered for meat between the 1941-42 average and that of 1945 in each province in absolute terms. Col. (1) reports the estimation results of eq. 1as in Col. (3) in Table 3. Col. (2) redefines the dependent variable, *Impatient* as equal to 1 if the individual opts to forego 20 or 10 percent. Col. (3) redefines the dependent variable, "*Impatient,*" as equal to 1 if the individual opts to forego 10 percent and excludes observations where the individual opts to forego 20 percent. Col. (4) excludes the individuals with the highest patience level, i.e. those that are never willing to forego a percentage of the win. Col (5) reports the marginal effects of estimating Eq. 1 using a Probit model. Col (6) reports the OLS estimate of Eq. 1 using *Patience* (an ordinal variable, where higher values indicate greater levels of patience) as the dependent variable. The list of controls is in Table 3, column 2. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table B.II: **Effect of Patience on Savings - First Stage**

Dependent variable:	Prob(Impatient)	
	(1)	(2)
$Cohort_i \times Scarcity_p$	-0.274***	-0.268***
	(0.077)	(0.067)
$Scarcity_p$	0.064	0.101
	(0.042)	(0.064)
$Cohort_i$	0.168***	0.160***
	(0.050)	(0.043)
Female	0.009	-0.015
	(0.019)	(0.021)
Age	0.109**	0.112**
	(0.051)	(0.046)
Age^2	-0.001**	-0.001**
	(0.000)	(0.000)
Parental High Education	-0.032**	-0.032**
	(0.016)	(0.015)
High-Skilled Father	-0.028*	-0.027*
	(0.014)	(0.014)
Num. Siblings	-0.001	0.002
	(0.004)	(0.003)
War Victims_p	0.035	0.004
	(0.053)	(0.050)
$\Delta(Fertility)_p$	-0.018	-0.052
	(0.086)	(0.079)
Bomb Tons_p	0.001	0.002
	(0.001)	(0.001)
$\text{Civil Victimization}_p$	-0.149	-0.088
	(0.109)	(0.101)
log(Net Income)	-0.054**	-0.033
	(0.022)	(0.025)
log(Wealth)		0.012*
		(0.007)
Retired		0.016
		(0.019)
University Degree		0.032
		(0.021)
Married		-0.055
		(0.041)
Single		-0.072*
		(0.040)
Divorced		-0.024
		(0.054)
Recovery		0.036
		(0.035)
Fin. Literacy		0.000
		(0.008)
Fin. Risk		0.006
		(0.010)
Health Insurance		0.005
		(0.024)
Fin. Situation		-0.040***
		(0.010)
Observations	1,960	1,921
Number of provinces	102	102

The table contains the first-stage results of equation 2, which in essence correspond to equation 1. $Cohort_i$ is a dummy equal to 1 if born in 1942-1945 and 0 if born in 1946-1957. $Scarcity_p$ is the % change in the number of animals slaughtered for meat between the 1941-42 average and that of 1945 in each province in absolute terms. Cols. (1) and (2) report the results with different sets of control variables. Standard errors are clustered at the province of birth level. The definition of all variables is in Table B.V. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table B.III: **Effect of Patience on Savings - Alternative Definitions**

	Reduced Form		2SLS	
Dependent variable:	$log(1+Savings)$	$arcsinh(Savings)$	$log(1+Savings)$	$arcsinh(Savings)$
	(1)	(2)	(3)	(4)
$Cohort_i \times Scarcity_p$	0.746*	0.760*		
	(0.380)	(0.389)		
Impatient			-2.775*	-2.828*
			(1.614)	(1.655)
$Scarcity_p$	-0.252	-0.268	-0.094	-0.107
	(0.227)	(0.235)	(0.209)	(0.216)
$Cohort_i$	-0.346	-0.350	0.116	0.120
	(0.209)	(0.212)	(0.178)	(0.183)
Female	-0.082	-0.081	-0.058	-0.056
	(0.081)	(0.086)	(0.088)	(0.093)
Age	-0.146	-0.158	0.158	0.152
	(0.226)	(0.234)	(0.305)	(0.317)
Age^2	0.001	0.002	-0.002	-0.001
	(0.002)	(0.002)	(0.003)	(0.003)
Parental High Education	-0.161**	-0.160**	-0.251***	-0.251***
	(0.063)	(0.065)	(0.093)	(0.094)
High-Skilled Father	0.022	0.024	-0.050	-0.050
	(0.067)	(0.070)	(0.100)	(0.103)
Num. Siblings	0.009	0.011	0.006	0.007
	(0.018)	(0.019)	(0.020)	(0.021)
War Victims$_p$	-0.120	-0.124	-0.031	-0.034
	(0.216)	(0.220)	(0.191)	(0.195)
$\Delta(Fertility)_p$	-0.293	-0.282	-0.341	-0.331
	(0.255)	(0.259)	(0.432)	(0.440)
Bomb Tons$_p$	0.005	0.005	0.009	0.009
	(0.004)	(0.004)	(0.006)	(0.006)
Civil Victimization$_p$	-0.980	-1.036*	-1.386**	-1.450**
	(0.601)	(0.623)	(0.626)	(0.649)
log(Net Income)	1.818***	1.841***	1.677***	1.697***
	(0.109)	(0.115)	(0.122)	(0.124)
Observations	1,984	1,984	1,984	1,984
Adjusted R-squared	0.443	0.424	0.068	0.057
Mean dep. var.	8.197	8.881	8.197	8.881
Number of provinces	102	102	102	102
First-Stage F-stat.			12.219	12.219

The table contains the second-stage results of equation 2 and the results of the reduced form. In cols. (1) and (3), the dependent variable is the natural logarithm of the reported yearly household savings plus one, $log(Savings+1)$. In cols. (2) and (4), the dependent variable is the inverse hyperbolic sine of the reported yearly household savings, $asinh(Savings)$. $Cohort_i$ is a dummy equal to 1 if born in 1942-1945 and 0 if born in 1946-1957. $Scarcity_p$ is the % change in the number of animals slaughtered for meat between the 1941-42 average and that of 1945 in each province in absolute terms. Standard errors are clustered at the province of birth level. The definition of all variables is in Table B.V. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table B.IV: **Effect of Meat Scarcity on Other Socio-economic Outcomes**

Dependent variable:	Education (1)	Fin. Literacy (2)	Income (3)	Wealth (4)
$Cohort_i \times Scarcity_p$	-0.131	-0.289	-0.026	-0.080
	(0.205)	(0.272)	(0.105)	(0.335)
$Scarcity_p$	0.173	-0.050	0.134	0.570*
	(0.207)	(0.298)	(0.108)	(0.336)
$Cohort_i$	-0.083	0.278	-0.066	-0.066
	(0.109)	(0.169)	(0.083)	(0.268)
Female	-0.238***	-0.262***	-0.115***	-0.324***
	(0.046)	(0.054)	(0.028)	(0.066)
Age	-0.130	0.085	0.120	0.025
	(0.167)	(0.220)	(0.116)	(0.278)
Age^2	0.001	-0.001	-0.001	0.000
	(0.002)	(0.002)	(0.001)	(0.003)
Parental High Education	0.833***	0.217***	0.261***	0.368***
	(0.069)	(0.079)	(0.041)	(0.085)
High-Skilled Father	0.182***	0.042	0.113***	0.379***
	(0.054)	(0.080)	(0.036)	(0.104)
Num. Siblings	-0.103***	-0.029***	-0.038***	-0.074***
	(0.013)	(0.011)	(0.009)	(0.016)
War Victims_p	0.120	-0.087	-0.059	0.115
	(0.190)	(0.283)	(0.124)	(0.313)
$\Delta(Fertility)_p$	0.126	-0.324**	-0.171**	-0.584**
	(0.164)	(0.131)	(0.068)	(0.276)
Bomb Tons_p	0.004	0.001	0.000	-0.003
	(0.006)	(0.007)	(0.004)	(0.007)
Civil Victimization_p	0.347	0.979**	0.110	1.222**
	(0.394)	(0.393)	(0.245)	(0.594)
Province FE	Yes	Yes	Yes	Yes
Observations	2498	2498	2496	2415
Adjusted R-squared	0.297	0.189	0.304	0.166
Mean dep. var.	3.276	0.662	9.638	11.037
Number of provinces	102	102	102	102

The table reports the estimates of eq. 1 using different individual outcomes. $Cohort_i$ is a dummy equal to 1 if born in 1942-1945 and 0 if born in 1946-1957. $Scarcity_p$ is the % change in the number of animals slaughtered for meat between the 1941-42 average and that of 1945 in each province in absolute terms. In Col. (1), the dependent variable is the individual's level of education (in an 8-level scale). In Col. (2), the dependent variable is the individual's level of financial literacy. In Col. (3), the dependent variable is the natural logarithm of the household's net annual income. In Col. (4), the dependent variable is the natural logarithm of the household's total wealth. Standard errors are clustered at the province of birth level. The definition of all variables is in Table B.V. * indicates significance at the 10% level. ** indicates significance at the 5% level. *** indicates significance at the 1% level.

Table B.V: **Variable Definition**

Variable	Type	Values
Impatient	binary	1 if willing to renounce 20% of a hypothetical lottery win equal to the annual net household income to receive it immediately instead of waiting for a year 0 otherwise
Patience	ordinal	1 if willing to renounce 20% of the hypothetical lottery 2 if willing to renounce 10% of the hypothetical lottery 3 if willing to renounce 5% of the hypothetical lottery 4 if willing to renounce 3% of the hypothetical lottery 5 if willing to renounce 2% of the hypothetical lottery 6 if not willing to renounce 2% of the hypothetical lottery
Household Savings	continuous	annual, nominal, in euros
$Scarcity_p$	continuous	absolute percentage difference in the number of animals slaughtered for meat between the 1941-42 average and that of 1945 in each province.
War Victims$_p$	continuous	number of casualties during WWII per 1000 population at the province level
$\Delta(Fertility)_p$	continuous	percentage difference in the number of live births per 1000 inhabitants between the 1941-42 average and that of 1943-45 in each province.
Bomb Tons$_p$	continuous	the amount of bombs (tons) dropped during WWII per 1000 population at the province level
Civil Victimization$_p$	continuous	number of incidents of civilian victimization events during WWII per 1000 population at the province level
$Recovery_p$	continuous	absolute percentage difference in the number of animals slaughtered for meat between the 1941-42 average and that of 1946-47 in each province.
Female	binary	1 if female 0 otherwise

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Variable	Type	Values
Age	continuous	in years
Parental High Education	binary	$\begin{cases} 1 & \text{if at least one parent has a middle school degree or higher} \\ 0 & \text{otherwise} \end{cases}$
High-Skilled Father	binary	$\begin{cases} 1 & \text{if father has high work status (i.e. teacher, junior manager, senior manager, member of the professions, entrepreneur, freelance lance)} \\ 0 & \text{otherwise (i.e. blue-collar, office worker, unemployed)} \end{cases}$
Num. Siblings	ordinal	number of siblings
Household Net Income	continuous	annual, nominal, in euros
Household Wealth	continuous	annual, nominal, in euros
Retired	binary	$\begin{cases} 1 & \text{if the individual has retired from work} \\ 0 & \text{otherwise} \end{cases}$
University Degree	binary	$\begin{cases} 1 & \text{if household head has a university degree} \\ 0 & \text{otherwise} \end{cases}$
Education	ordinal	$\begin{cases} 1 & \text{if no education} \\ 2 & \text{if elementary school degree} \\ 3 & \text{if middle school degree} \\ 4 & \text{if high school degree} \\ 5 & \text{if university degree} \\ 6 & \text{if masters/PhD degree} \end{cases}$
Married	binary	$\begin{cases} 1 & \text{if married} \\ 0 & \text{otherwise} \end{cases}$
Single	binary	$\begin{cases} 1 & \text{if single} \\ 0 & \text{otherwise} \end{cases}$

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Variable	Type	Values
Divorced	binary	1 if divorced 0 otherwise
Fin. Literacy	ordinal	0 if did not reply 1 if does not spend time reading financial news 2 if spends less than half an hour a week reading financial news 3 if spends between half an hour and one hour a week reading financial news 4 if spends between 1 and 4 hours a week a week reading financial news 5 if spends more than 4 hours a week a week reading financial news
Fin. Risk	ordinal	1 if seeks very high returns, regardless of a high risk of losing part of the invested capital 2 if seeks a good return, with reasonable security for the invested capital 3 if seeks a reasonable return, with a good degree of security for the invested capital 4 if seeks low returns, without any risk of losing the invested capital
Health Insurance	binary	1 if own additional private health insurance 0 otherwise
Fin. Situation	ordinal	1 if the household's disposable income is enough to get through the month with a great deal of difficulty 2 if the household's disposable income is enough to get through the month with difficulty 3 if the household's disposable income is enough to get through the month not easily 4 if the household's disposable income is enough to get through the month fairly easily 5 if the household's disposable income is enough to get through the month easily 6 if the household's disposable income is enough to get through the month very easily